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Executive Summary

Introduction

Overview

The California Long-Term Energy Efficiency Strategic Plan (Strategic Plan) encourages programs that integrate a full range of demand-side management (DSM) options including energy efficiency (EE), demand response (DR), and distributed generation (DG) as fundamental to achieving California's strategic energy goals. The California investor-owned utilities (IOUs) have identified Integrated DSM (IDSM) as an important strategic policy priority. The California IOUs' 2010-2012 portfolios of EE programs include specific integration activities within each program implementation plan (PIP) at the statewide and local program level. Each of the California IOUs has designated integrated pilots in response to the Strategic Plan DSM Coordination and Integration Strategy. In addition, the IOUs have carried out a number of activities to promote IDSM including employee training on IDSM, research and development of integrated emerging technologies, marketing campaigns' messaging of IDSM, development of integrated audit tools for customers, and planning an IDSM data tracking and reporting system.

Study Objectives

This evaluation is an overarching process evaluation of the California IOUs' attempts, successes, and challenges experienced during efforts to integrate their DSM programs: EE, DR, DG, and AMI enabled tools and rates. The objectives of this study were reached through the collection and analysis of a number of primary and secondary data sources. The evaluation team requested specific information from the IOUs on their IDSM training, marketing, and personnel who had been active in the development and implementation of IDSM. The evaluation reviewed the Joint IOU IDSM Compliance Tracking Quarterly Reports to collect information on the IOU integrated programs and projects. The evaluation team attended and participated in the IDSM Joint Task Force meetings to develop a better understanding of the integration processes being undertaken at the IOUs and provide the IOUs with information on the findings from the process evaluation. The evaluation also completed a series of in-depth interviews with IOU personnel who the IOUs designated as subject matter experts and who had been active in the development and implementation of IDSM.

The process evaluation findings for the four California utilities are presented in this report along with utility-specific recommendations to help them further the integration of DSM technologies into their program offerings. Aspects of utility programs that have been successfully integrated as well as those that have proven difficult to integrate are included in this study. The conclusions

and recommendations from this study will help the IOUs assess their individual successes and barriers, help them to learn from IDSM experiences at the other IOUs, and communicate to the IOUs ways that integration can be furthered in their own programs.

Summary of Results

Each of the utilities has experienced some successes and encountered barriers as they strive to integrate their DSM practices. Specific successes and barriers for each utility are highlighted below. This list is not exhaustive; rather, it includes activities that were highlighted during the personnel interviews.

PG&E

- Account Executives are actively promoting integration as demonstrated by the 88 integrated projects completed in 2009-2011 (most of them for large commercial, industrial, and agricultural customers and school districts).
- An outstanding IDSM training program includes two off-site trainings and is open to third-party implementers, contractors, and government partnerships. The training also offers in-home training for personnel that are unable to attend the larger training sessions.
- PG&E successfully integrated its Energy Savings Assistance Program with its SmartAC program. Energy Savings Assistance Program contractors are educating customers and signing them up to participate in the SmartAC program.
- Implementation of an integrated residential audit tool that provides audit suggestions incorporating EE, DG, DR, and AMI-enabled programs. The tools incorporate customer hourly load data.
- Challenges continue with integrating marketing budgets to support IDSM. The current IDSM marketing budget is limited to covering market research projects and some promotional displays. The nonresidential program team, however, provides substantial support using their program budgets to develop IDSM collateral material. The residential programs do not provide the same level of support. It is also a challenge for the marketing team to pool marketing funds from the DR and DG teams due to funding silos.
- PG&E's current methods of tracking IDSM accomplishments are unsophisticated. PG&E has sophisticating tracking for EE, DR, and DG. However, their only method of tracking the interrelations of how many of these elements a single customer may participate in is via individual tracking by account reps that are added to the IDSM quarterly reporting spreadsheet. There are no reports or analysis conducted on these data to determine if there are any customer patterns, relationships, project timelines, etc. that can help inform the account team or program teams on how to further integrate across IDSM elements across customer segments.

SCE

- Account managers are actively promoting integration as demonstrated by the 78 integrated projects completed 2009-2011.
- The Office of the Future program has proven the value of a system-wide approach to retrofitting the lighting systems in offices.
- On-going implementation of a new data management system that will improve the utility's ability to track projects and integrated projects.
- Implementation of an integrated residential audit tool that provides audit suggestions incorporating EE, DG, DR, and AMI-enabled programs.

SDG&E

- The Local Island program provided customers with a single point of contact for EE, DR, and DG, helping to ease customer participation in multiple programs for a more integrated DSM experience.
- SDG&E has implemented an integrated residential audit tool that provides audit suggestions incorporating EE, DG, DR, and AMI enabled programs. The tools incorporate customer hourly load data.
- SDG&E's Segment Advisors are responsible for being informed of all the DSM strategies that would help customers in their segment better manage their energy. In fact, the position is unique to Sempra. Segment Advisors are able to focus on one segment and integrate DSM for those customers specifically.
- SDG&E currently tracks EE, DR, and DG participation but has no means to easily track the integration of DSM at a site. Account representatives are tracking integration individually. This methodology leads to lost knowledge and information when individuals change jobs. A method to integrate participant tracking databases is needed.
- After SDG&E's IDSM training, attendees completed a post-workshop survey in which they were asked to identify barriers to IDSM. The top barriers that were listed include internal silos/communication (61%), budgets and funding (54%), and CPUC/regulatory policy (35%).

SCG

- SCG and SCE have developed a good working relationship to make sure their low income customers benefit from natural gas and electricity low income programs.

- SCG has developed relationships with water utilities to not only reduce use of water but also natural gas used to heat water.

Conclusions

The evaluation of the integration processes has led to the development of several conclusions. The following is a short list of positive conclusions.

- Utility personnel have a good understanding of the concepts of IDSM. Utility personnel defined IDSM as incorporating the integration of EE, DR, and DG. Some personnel failed to incorporate DG in their definition of integration, while others added AMI facilitated programs, GHG reduction, and water conservation efforts.
- Commercial and industrial account executives provide their customers with information necessary to facilitate the implementation of integrated projects.
- PG&E and SDG&E have implemented an integrated residential audit tool that uses individual hourly load data. SCE's integrated residential audit tool is available and will soon incorporate individual hourly load data.
 - The integrated residential audit tool will provide a source of valuable information on the effectiveness of integrated recommendations on the likelihood of uptake across alternative types of DSM within the residential sector.
- Within the residential sector, the IOUs are beginning to integrate EE programs with rate, cycling, and behavioral programs facilitated by the AMI installation.
 - PG&E's joint delivery of the Energy Savings Assistance Program with the Smart AC program has led to the integration of EE and DR programs. The joint delivery of these two programs may provide information on the costs and benefits of integration.

The following is a short list of negative conclusions.

- The Integrated Pilots were not designed with integration as a primary objective. Due to the lack of integration focus, the current set of Integrated Pilots did not provide a proving group for integration or an opportunity for the IOUs to collect data on the potential energy costs or benefits attributable to integrated projects.
- Integrating EE and DR into a project often leads to a reduction in the anticipated DR impact for the project relative to DR without EE. The reduced savings from integrated DR projects reduces the incentive to pursue DR integration with EE.
- Undertaking an integrated project or adopting integrated technologies is often more expensive than implementing a technology with only EE or DR capabilities.
- The different timing of EE, DR, and DG program cycles is a barrier to integration.

- The definition of IDSM is not concrete nor is it comprehensive. It is difficult for the utilities to achieve IDSM without a clear description of what it entails.
- The limited funding available for DG is hampering the incorporation of DG into integrated projects and marketing.
 - A key barrier to analyzing integrated technologies incorporating DG as part of the Emerging Technologies program is the lack of funding to support research and assessment of DG technologies. The EE guidelines that determine emerging technology funding does not include and/or allow for funding DG activity.
- The current application process is a barrier to integration. Completing multiple applications with differing review times and funding cycles discourages sites from completing integrated projects.

Recommendations

Using the findings from the evaluation, the report provides recommendations to help each IOU improve their understanding, implementation, and tracking of IDSM. The evaluation team recommends that each IOU study the conclusions and recommendations for their utility and for the three other utilities evaluated for this study. Reviewing what the evaluation team has found to be successful at the other IOUs will help the four IOUs learn from the other's successes. Using this approach, the IOUs will be able to develop and implement best practices in the new field of integrated DSM.

The process evaluation developed an extensive list of recommendations. The following is a short list of the recommendations provided in the report.

- ***SCE, SDG&E, and SCG should coordinate with PG&E by reviewing PG&E's training and incorporating aspects that are appropriate for their utilities.*** PG&E's IDSM training and knowledge enhancement program is more extensive than the IDSM training offered by the other IOUs.
- ***The CPUC should provide the IOUs with a concise definition of IDSM.*** During the course of the evaluation the definition of integration was a subject of discussion. The IOUs have included the integration of low income programs with moderate income programs as a form of integrated DSM. The combination of low and middle income programs may be an efficient use of resources, but it is not clear that it is IDSM.
- ***The IOUs should work to develop a tracking system that will simplify the integration of program participation information.*** The utilities do not currently track program participation across EE, DR, and DG in a way that allows account executives, program managers, or evaluators to easily determine participation in multiple types of DSM at a site or within a project.

- The information in an integrated tracking system should be analyzed to determine the sectors and segments that are currently implementing integrated projects. This information should be used to help focus future integration efforts.
- An integrated tracking system would provide utility personnel and evaluators a clearer picture of how much integration across EE, DR, and DG has taken place to date and what potential integration opportunities still exist. This is a barrier to further progress towards an assessment of IDSM.
- ***The IDSM Task Force and integration groups within the utilities should include representatives from AMI enabled programs, including behavioral and rate based programs.*** Integrating AMI enabled programs with EE programs may be an effective pathway to integration for residential and small commercial customers.
- ***The IOUs and the CPUC should discuss the development of integration goals.*** Goals could be based on savings targets or the number of integrated projects.
 - Verifying the attainment of integration goals would require the development of either an integrated tracking database or separate databases that are easily integrated.
 - Integration goals could help compensate for the lower DR savings available from an integrated EE/DR site.
- ***The CPUC should consider the development of a reliable DG funding source.*** Integration with DG has been hampered by the lack of DG funds. By providing reliable funding for DG technologies for the purpose of integration, the utilities will have more flexibility to include DG in its integrated pilots and integrated emerging technologies projects going forward. DG has not been integrated fully by the utilities, at least in part, because of the barriers to funding.
- ***The IOUs should work to develop programs and pilots with integration as a central objective.*** These types of programs and pilots should provide customers with a single point of contact for multiple types of DSM, an attribute that has been found to facilitate customer understanding of DSM.
- ***If the CPUC does not develop integration goals, the IOUs should develop internal integration goals for programs and/or types of DSM.*** The integration goals would be an added encouragement to pursue integrated projects.
- ***The IOUs and the CPUC should consider the development of a new incentive or financing mechanism for integrated projects and technologies.*** Integrated projects and technologies often have a higher upfront cost. Rebate adjustments or financing options may need to be developed to overcome this barrier.
- ***The IOUs should develop integrated programs.*** Integrated programs would provide a single point of contact for customers, eliminate barriers associated with different planning and funding cycles, and lead to the natural development of integrated rebates.

- ***The IOUs and the CPUC should discuss ways to limit the negative influence of different funding cycles and reservation periods on integrated projects.*** Integrated projects work across multiply types of DSM and multiple funding cycles. Different funding cycles and reservation periods is a barrier to integration.
- ***The IOUs need to develop integrated programs designed to influence new construction design at its earliest phase.*** Integrated designs often incorporated elements that must be considered at the initial phases of new construction design. The IOUs must work with designers and architects to inform them of IDSM goals, potential, and utility programs.
- ***The IOUs should develop integrated training and outreach for third party implementers.*** A current barrier to integration is the lack of third party implementers with cross program missions and skills. Training and outreach by the IOUs on the goal of integration, combined with programs and projects requiring integrated contracting skills, will lead to the development of new skill sets among third party implementers.

1

Introduction

The California Long-Term Energy Efficiency Strategic Plan (Strategic Plan) encourages programs that integrate a full range of demand-side management (DSM) options including energy efficiency (EE), demand response (DR), and distributed generation (DG) as fundamental to achieving California's strategic energy goals. The California investor-owned utilities (IOUs) have identified Integrated DSM (IDSMS) as an important strategic policy priority. The California IOUs' 2010-2012 portfolios of EE programs include specific integration activities within each program implementation plan at the statewide and local program level. In addition, each of the California IOUs has proposed a series of activities, pilots, and other programs in response to the Strategic Plan DSM Coordination and Integration Strategy.

The Omnibus IDSMS Process Evaluation is an overarching process evaluation of the California IOUs' attempts, successes, and challenges experienced during efforts to integrate their DSM programs: EE, DR, and DG. The process evaluation findings for the four California utilities are presented in this report along with utility-specific recommendations to help them further the integration of DSM technologies into their program offerings. Aspects of utility programs that have been successful with integration as well as those that have proven to be a hindrance are also included in this study to communicate to the IOUs ways that integration can best be furthered in their own programs. By presenting the successful integration strategies, the utilities are able to examine them and determine if they are appropriate for their own program offerings.

Because the budgets, programs, and organization structures of the IOUs differ from each other, the process evaluation does not prioritize the list of recommendations to the IOUs. The costs and benefits of implementing the recommendations are expected to differ by IOU since each is at a different stage of fully integrating DSM strategies. The IOUs have communicated that they have already begun the implementation of some of the recommendations.

This report contains approximately nine sections for each utility that discuss the various areas reviewed for this evaluation. The IOUs have carried out a number of activities to promote IDSMS including employee training on IDSMS, research and development of integrated emerging technologies, implementation of integrated pilot programs, improving the leveraging of marketing campaigns to include the message of IDSMS, development of integrated audit tools for customers, and planning an IDSMS data tracking and reporting system. This introduction reviews

the budget and expenditures for the IDSM program, presents the data used in this process evaluation, and briefly describes the contents of this study.

1.1 Budget and Expenditures for Statewide IDSM Program

The budget for DSM Coordination and Integration provides cost coverage for personnel participating in the IOU internal integration task forces, to provide for representation at the statewide task force level, and to facilitate support by subject matter experts. The budget also funds its associated expenses related to the deliverables of the Task Force and the coordination of the specific IOU integration activities. Table 1-1 presents information on the budget and expenditure to date for IDSM by utility. To date, only PG&E has used a sizeable share of its IDSM budget.

Table 1-1: Integrated DSM Budget and Expenditure to Date

Utility	Program Cycle Budget	Program Expenditures To Date*	% of Program Budget Spent to Date*
PG&E	\$1,070,815	\$848,841	79%
SCE	\$1,251,238	\$320,969	26%
SCG	\$600,122	\$151,395	25%
SDG&E	\$600,122	\$72,736	12%

* Program expenditures to date were found in PG&E Monthly Energy Efficiency Report for September 2012 and SCE, SCG, and SDG&E's Monthly Energy Efficiency Report for August 2012 on the California Energy Efficiency Groupware Application (<http://eega.cpuc.ca.gov/>)

1.1.1 Data

Data for this process evaluation were gathered through data received in response to requests sent to each utility, review of Joint IOU IDSM Compliance Tracking Quarterly Reports, attendance at IDSM Joint Task Force meetings, and a series of in-depth interviews conducted by the Itron/KEMA evaluation team.

Responses to Data Requests

The research team sent a series of data requests to each utility to gather information relevant to the IDSM initiative. Responses were received and included a variety of items, such as:

- IDSM education and training materials,
- IOU Staff feedback on IDSM training,
- Names and contact information of utility staff involved in IDSM,
- IDSM-related marketing collateral for residential and non-residential customers,

- Program Implementation Plans, reports, and associated marketing materials for pilot programs,
- Background information and studies on selected integrated emerging technologies,
- Fact sheets exemplifying IDSM showcase projects,
- Information about smart meter-enabled web-based tools used by utility customers, and
- Status and details on integrated audit tool development.

Joint Task Force Quarterly Reports

Beginning after the first quarter of 2010, the Statewide IDSM Task Force has provided quarterly updates on eight directives mandated in CPUC Decision 09-09-047. The reports describe individual IOU integration efforts and success stories, and they include narrative updates for each of the tasks from each IOU. Each report is accompanied by an Excel tracking file indicating where programs and pilots are integrating EE with DR and DG.

Interviews

In-depth interviews were conducted with numerous utility staff members in order to gather data on IDSM efforts. The research team conducted a total of 53 interviews with 54 staff members including program managers, marketing staff, account executives, managers and staff of pilot programs, emerging technologies programs, and integrated audit programs.

IOU	Interviews Conducted	Number of Interviewees
PG&E	15	16
SCE	16	16
SDG&E	14	14
SCG	8	8

1.1.2 Report Contents

The individual utility IDSM process evaluation contains nine sections for PG&E and SDG&E and ten sections for SCE. Because SCG provides its customers with only natural gas, it only includes eight sections. This report begins with this introduction and concludes with a Conclusions and Recommendations section that encompasses the findings from all four utilities. While there are some differences in the utility specific reports, each utility’s report includes the following:

- **Section 1** describes the Integration Knowledge Enhancement and Training received by staff members.
- **Section 2** presents the integrated pilot programs.

- **Section 3** presents information on integrated emerging technologies.
- **Section 4** describes the development of the online integrated audit tools.
- **Section 5** presents information from interviews with account executives.
- **Section 6** describes the integrated marketing collateral and outreach efforts.
- **Section 7** presents information on the roll out of the smart meters, access to interval data, and how this information is being used to provide an integrated solution.
- **Section 8** presents information on IDSM tracking and reporting.

2

Pacific Gas & Electric

2.1 Knowledge Enhancement/Training

2.1.1 Definitions of IDSM

Through PG&E management's vision or guidance, IDSM should provide customers with holistic programs that are meaningful for customers. They have instructed the Customer Energy Solutions staff to look beyond strictly defined regulatory budgets or program definitions to offer integrated solutions that can draw from all demand-side management opportunities. From this perspective, the interviewees provided several descriptions of integrated programs that address integration to include; EE, DR, DG, rate options, and integrated delivery strategies. The joint delivery of the Energy Saving Assistance Program/Smart AC program has integrated the low-income delivery channel with a DR program. The California Solar Initiative (CSI) program has EE requirements (i.e., audits and water heater insulation for solar water heating). Also, PG&E delivered up to 88 integrated solutions for nonresidential projects that incorporated either; EE and DR; EE and DG; EE, DR, and DG from 2009 through 2011 (see the Account Executives section for number of projects by IDSM approach). Several of the projects also included Climate Smart, PG&E's rate offset program which is no longer offered.

2.1.2 Workshops and Training

PG&E has been conducting annual integrated sales training efforts since 2009. The trainings have generally consisted of two two-day sessions; one in Northern California (Sacramento) and one in Central California (Fresno). The audiences for these sessions are the internal and external customer facing staff that include account representatives, business solutions phone representatives, third parties, Local Government Partnerships, contractors, as well as program and program support staff. The intent is to educate staff on integrated approaches, tools and resources available to deliver integrated solutions for various customer segments. The dates of these sessions were as follows:

- 2010 – March 2-3 in Sacramento, March 9-10 in Fresno
- 2011 – March 22-23 in Fresno, March 29-30 in Sacramento
- 2012 – March 20-21 in Sacramento, March 27-28 in Stockton

The two-day trainings are conducted similar to conferences where there is a schedule with four 1.5-hour long tracks that will include up to six concurrent sessions each day. Attendees can sign up ahead of the trainings for the sessions that are most relevant for their job needs. Each session has prepared materials to cover relevant information for that area. Below is a brief description for the Ag&Food Processing session.

Ag & Food Processing

Join us for an interesting look into a day in the life of a customized Ag project. We will also present the anatomy of an Ag pump, review the NEW motor standards – “Tier 2” motors are the new premium efficiency motors!

Got wineries? We have a winery expert talk about Selling IDSM to Small/Medium wineries – sorry no tasting. We wrap up the session with the latest on IDSM Gas Tactics, Refrigeration, Energy Solutions and Services, Rep Success Stories and an Ag&Food Jeopardy game where you can actually win fresh farm products!

PG&E’s IDSM task force and their respective teams are responsible for developing the training materials for their respective sessions. The attendees are provided with a training binder that includes the detailed material covered in the session as a take-away to re-enforce what they learned. Below is a list of sessions for the 2011 training in Sacramento.

2011 Regional Integrated Training Agenda - Sacramento

Sacramento

4 Segment Breakouts / 4 Cross Cutting breakouts
Segment Break-outs - 1.5 hrs, Cross Cutting - 1 hr

Start	End	Day 1	Start	End	Day 2
8:15 AM	9:00 AM	Registration, Continental breakfast	8:00 AM	8:30 AM	Continental breakfast
9:00 AM	9:45 AM	Director Welcome	8:30 AM	10:00 AM	Segment Breakout 3
9:45 AM	10:00 AM	Break			Bio Tech and High Tech
10:00 AM	11:30 AM	Segment Breakout 1			Healthcare
		Ag & Food Processing			Industrial
		Healthcare			Offices
		Schools (Colleges and universities)			Schools (k-12))
		Offices	10:00 AM	10:15 AM	Break
		Small and Medium Business	10:15 AM	11:15 AM	Cross Cutting Breakout 3
11:30 AM	1:00 PM	Lunch and Networking with 3P			Demand Response/PDP
1:00PM	2:00PM	Cross Cutting Breakout 1			General Session
		MARA			Products
		General Session			Sales Process
		Renewables			Sustainability Climate
		Sales Process			Interconnection
		Sustainability Climate			Trade Professional Networking
2:00 PM	2:15 PM	Break	11:15 AM	12:00 PM	Lunch and Trade Pro's
2:15PM	3:45PM	Segment Breakout 2	12:00 PM	1:30 PM	Segment Breakout 4
		Food Service			Ag and Food Processing
		Government			Retail & Food Retail
		Bio Tech - High Tech			Government
		Industrial			Hospitality
		Hospitality			Small and Medium Business
		Networking	1:30 PM	1:45 PM	Afternoon Break
3:45 AM	4:00 PM	Break	1:45 PM	2:45 PM	Cross Cutting Breakout 4
4:00 PM	5:00 PM	Cross Cutting Breakout 2			Quick Therm Savings
		Customized Solutions			Customized Solutions
		Demand Response/PDP			MARA
		LEED			LEED
		Products			Renewables
		Quick Therm Savings	2:45 PM	3:15 PM	Final Raffle and Adjourn
		Interconnection			
5:00 PM	6:00 PM	Break, Appetizers & 3P NETWORKING			
6:00 PM	8:00 PM	Awards & Dinner			

The training provides a regulatory overview and PG&E management viewpoints and then goes into segment and cross cutting breakout sessions that focus on knowledge transfer. Each session is different, with an emphasis on the following elements:

- Updates in the segment (regulatory, economic, etc.),
- Sharing of successful integrated case studies, and
- Interactive elements – role playing, customer examples to work through as a team, games to test knowledge of concepts, and other creative ways to engage the audience.

The trainings are a required activity for all customer-facing and support staff in the Customer Energy Solutions department. Staff who missed the off-site training can attend one of the several make-up sessions that will cover the high-level learning objectives regarding IDSM. These make-up trainings are delivered via webinar or in in-house meetings. PG&E administers a post

training survey. The results from the survey are the source for reporting on progress toward program performance metrics on key employee awareness and knowledge of IDSM programs.

Key learning goals to support the metrics include:

- Understand the regulatory view of integration, integration requirements and delivery methods,
- List the demand side management programs that are required to be integrated, and
- Understand how to facilitate the delivery of integrated offerings to customers.

Knowledge Transfer

A key benefit of training also comes from the sharing of best practices for selling integrated projects to customers. These insights come from account teams that normally include an account representative and someone from the program, marketing, and solutions marketing staff (may also include someone from the technology/products group). Lessons learned are conveyed in reports (see the quarterly IDSM report appendix), department presentations, and also within the training sessions. Below are some of the key lessons learned that illustrate PG&E's holistic approach to selling integrated projects (from the May 2012 IDSM Task Force presentation).

Use a Customer-Based Solution

- Create an integrated energy plan with the customer.
 - Identify solutions to match IOU programs with the customers' needs based on that plan.
 - Use an audit to identify integrated opportunities for the customer to implement.
- Use a checklist of various programs and channels to create customer solution.
- Leverage marketing collateral that focuses on delivering programs to customer segments as opposed to program focused material.
- Create team approach that includes the appropriate subject matter experts along with customer decision makers and corporate representatives as appropriate.
- Use a team of vendors and program managers to leverage industry and product expertise for the customer.
- Include appropriate third party providers early in the energy management process to plan projects to complement IOU-offered programs.

2.1.3 Meetings

PG&E has the following teams that oversee communicating and implementing its IDSM efforts, activities and projects, including sharing lessons learned and best practices.

- IDSM Manager Team
- IDSM Task Force – Meets once a month to exchange information as the subject matter experts and leaders overseeing PG&E’s integrated efforts. The IDSM Task Force also provides feedback and updates on IDSM statewide program and regulatory efforts
- IDSM Statewide leads – Meet once a month to update on efforts across the statewide programs and teams, including integrated efforts. The statewide leads are also active on several cross-cutting teams for various efforts, which fosters information sharing and integration
- IDSM Quarterly Report Team – Works together on an ongoing basis to report and share integrated efforts. These team members are integral to implementing the integrated projects, efforts and activities that PG&E includes in the quarterly IDSM report
- IDSM Marketing – The marketing team is completely integrated by customer segment and meets on a regular basis

2.1.4 Impact from Trainings

According to the results from PG&E’s post training survey, there were nearly 280 attendees at the March 2011 training session in Fresno. Nearly 18% of the attendees were PG&E account managers, 20% were third-party program implementers and attendees from other departments were represented in increments less than 10%. The makeup of attendees in Sacramento had similar distributions. Here are other key findings from the survey.

- An average of 96% of training participants from both meetings found the training meetings useful and relevant to their job.
- Ninety four percent of participants understood that integration is offering customers programs as a “bundle” or “package”.
- Eighty eight percent of participants understand how to offer integrated solutions as a result of attending the meeting.
- Ninety one percent of participants know who to contact for tools to offer the total “customer solution”.
- Eighty eight percent of participants stated they were already coordinating with other programs to integrate offerings

2.1.5 Conclusions

It is clear that PG&E's senior management have established a vision for IDSM that the entire Customer Energy Solutions staff (includes EE, DR and DG) understood and are trying to follow. The vision or guidance directs the Customer Energy Solutions staff to look for opportunities where they can holistically plan and deliver programs that are meaningful for customers.

“It is ingrained in each employee that PG&E is trying to integrate all of their demand-side offerings for their customers. This message is communicated consistently through the all-hands meetings, meeting with the VP or senior directors. It's perpetually talked about. It's very clear that the intent is to put together solutions for customers that incorporate as many demand-side programs as are relevant and useful. I hear we're trying to find solutions that work for the customer. We're reminded to think broadly about the things PG&E has to offer.”

PG&E's follow-up to this vision is to establish a customer solutions centric strategy and reinforces this strategy via the annual training workshops. All interviewees speak to the training workshops as the primary source for gathering information about what is available or coming soon to support integrated solutions and to share lessons-learned. And while many of the attendees believe they are already knowledgeable about IDSM solutions, they still view the trainings as important to continue to build on their knowledge and experience.

PG&E also extended this training and sharing to its third-party implementers, contractors, and government partnerships to make sure they are aware of PG&E's IDSM strategies. PG&E also invited the CPUC staff to attend the trainings for them to view PG&E's training approach.

With PG&E's efforts to raise awareness about integrated solutions for customers, PG&E has also raised the perception about the regulatory barriers limiting full integration due to separate funding streams. So even though the interviewees are aware of the objectives to look beyond the barriers, they still state that regulatory barriers are a primary concern limiting integration efforts.

2.1.6 Recommendations

Based on the results from PG&E's post workshop/training session surveys, it is clear that PG&E is achieving a high rate of success in building knowledge of IDSM and transferring lessons-learned. Due to this success we recommend the following:

- The CPUC should consider using PG&E's model for IDSM training as an example for the other IOUs.

2.2 Pilots

PG&E has classified four pilots as IDSM pilots in its quarterly reports. These are:

- Energy Savings Assistance Program (ESAP)/Smart AC (integrates EE, DR and Low Income)
- Energy Savings Assistance Program (ESAP)/Middle Income Direct Install (MIDI) Program (integrates EE with Low/Mid Income)
- Zero Net Energy (integrates EE and DG)
- Green Communities (potentially may integrate all DSM components—EE, DR, and DG; may also include sustainability strategies such as recycling and water, depending on climate action plans)

All pilots were designed and initiated in response to various separate objectives in the Strategic Plan. As such, the pilots were not originally designed as IDSM “program” pilots. However, per the above, three of the pilots include some subprogram elements where offerings may include EE, DR, and DG while the fourth pilot integrates a low income program with a traditional EE program.

2.2.1 Smart AC/Energy Savings Assistance Program

PG&E is implementing an enrollment program for the Smart AC DR program that is integrated with the Energy Savings Assistance (low-income) Program. This program is also referred to as the HVAC Affiliate Pilot. The goal of the program is to leverage the AC tune-up contractor as spokespeople for the Smart AC DR program. According to the interviewee, this approach came from analysis by the Smart AC team on the enrollment rates and feedback on the various delivery channels they had used for the program. The analysis revealed that most customers are aware of EE, but it is harder for them to make the leap to DR. Having a professional they trust, who has been to their house doing work for them, giving them information on how the program works makes it easier to sign up the customer for the DR program.

Marketing

The program started with the first HVAC affiliates in 2009 and has since focused on enrolling contractors as a primary objective in 2011. The primary marketing method for the Smart AC program is targeted mailings to HVAC contractors who are currently signed up to provide services through various PG&E programs (for Energy Savings Assistance Program the mailings are targeted specifically to contractors supporting that program). In order to narrow the targeting to only homes with ACs, the program team is also trying to leverage data from the contractors on homes with AC or in hot climates along with PG&E data indicating the customer has gone through some kind of EE program related to their air conditioner. This way, the program team

can help to make sure the outreach will be a better experience for the customer and contractor since they are targeting homes that can effectively participate.

Effectiveness of Integration

From the interviewee's perspective, leveraging affiliates for enrollment makes for happier, more successful customers who come to the program based on the guidance of a trusted energy professional.

The interviewee also sees that the program has been successful in helping the team deal with a difficult area of diplomacy with HVAC contractors – the contractors wanted to be the ones to install the Smart AC devices and did not understand why they could not. The referral incentive has been a great success in keeping the HVAC community happy while providing this really necessary educational experience for the customers. The team is getting great feedback from HVAC contractors in the field. The program team is hopeful that the more automated it can make the program; the easier it will be to sign up contractor affiliates.

Challenges

One key difficulty for this pilot is that customer data are always changing. Customers move and it takes a while for PG&E's customer information to be up dated. In addition, PG&E has to constantly fine-tune its process so customer information is protected and yet provide the information needed for a successful installation.

Another big challenge mentioned has been with the quality of data coming from the technicians. This summer PG&E is moving from having the technicians enter data manually on the forms to having them enter the data via laptops. With the manual form, PG&E found it often could not read the technician's writing. Key customer information such as the account number and SAID number would either be missing, incorrect, or unintelligible.¹ There were also significant delays in getting completed enrollment forms to PG&E. The team believes using laptops will minimize data collection and entry errors while also eliminate the lag time in updating the tracking.

There was also inconsistency with the thermostats offered by the Energy Savings Assistance Program versus the Smart AC program and the inconsistency required the scheduling of follow-up visits for Smart AC installations. Follow-up appointments were often challenging to schedule so installing the Smart AC component was less successful. To solve this issue the Smart AC team included an automated enrollment process for the technician's laptops, restricting the tune-up technician to enrollments to the Smart AC switch only (no thermostats); these can be installed without a follow-up appointment.

¹ The SAID number is PG&E's site account identification number.

Managing the Pilot

According to the interview, the Smart AC program has 165,000 installed customers. During the season the program focuses on load shed and customer interaction on the big picture. PG&E is looking to expand the program by inviting additional affiliates into this program. They were not as successful as they hoped using community affiliates and non-profits so they are considering other channels such as the retailer Best Buy. PG&E plans to invite Best Buy to help recruit enrollment into the program since Best Buy already has a PG&E sponsored department that features EE devices. PG&E is also looking to recruit Best Buy's Geek Squad technicians to do energy audits, leading Best Buy to be a Smart AC-referring affiliate.

Knowledge and Guidance

The interviewee stated the program was mandated by senior management with a deadline for having the affiliate effort in the field by the end of 2009. The timing to roll the program out was limited by the need to have staff in place. From PG&E's priorities on a scale of 1-10, this was at least a 9.

Budget

There is not specific budget allotted for the pilot or the affiliate effort; they are both included in the overall Smart AC budget. The referral incentives are part of the Smart AC marketing budget since referrals from an affiliate limits the need for direct mailings.

2.2.2 Energy Savings Assistance Program/Middle Income Direct Install

PG&E designed this program along with Local Government partnerships (LGPs) to provide the local government partnerships a program offering for their moderate income residential customers. These customers tend to fall outside the boundaries of the low-income (Energy Savings Assistance Program) program yet may not have the means to participant in the more comprehensive Energy Upgrade CA program. PG&E describes the Energy Savings Assistance Program/Middle Income Direct Install program as achieving integration by combining the program delivery channels used by the low income programs to deliver the same direct install measures to moderate income customers. It also allows for local government partnerships to leverage this program with their American Recovery and Reinvestment Act-funded programs. The program, however, does not directly integrate multiple types of DSM.²

² During the course of the evaluation the definition of integration was a subject of discussion. As this program indicates, the IOUs have included the integration of low income programs with moderate income programs as a form of integrated DSM. The combination of low and middle income programs may be an efficient use of resources, but it is not clear that it fits the definition of IDSM. The CPUC should provide the IOUs with a more concise definition of IDSM.

According to the interview, when low-income contractors go out to market in low-income neighborhoods, they encounter middle income customers whose homes they skip because they do not qualify for the program. PG&E designed the Middle Income Program to enable the contractors to seamlessly deliver the same suite of measures to customers who fall just outside of that low income program's income criteria (up to 400% of the federal poverty level.) The direct install measures and upgrades include; air conditioner tune-ups, attic and pipe insulation, structural repairs, comprehensive lighting, shower aerators, and appliances.

Key objectives for this pilot are to reach 1,000 single family homes and achieve an average energy savings of 20% per home. The program also targets multifamily and manufactured homes. The savings and budget are attributable to the Energy Upgrade California program. So far, according to the interviewee, the program has completed EE improvements in over 1,300 homes in 2011 with savings of 665.5 kW and 1,271,963 kWh. PG&E sees the Middle Income Direct Install program as a full program and not a pilot. It is operating the program in 11 local partnerships for 2011-2012 and plans to expand to 13 in the next program cycle. PG&E has no plans to discontinue the program.

Integrating DSM Smart AC/Energy Savings Assistance Program

As discussed above, by combining Smart AC enrollment with the Energy Savings Assistance Program, PG&E has integrated DR into its Energy Savings Assistance Program. For now, the pilot combining Smart AC and EE is only targeting the low income customer via the Energy Savings Assistance Program. PG&E is in the process of expanding this approach and hopes to have this extension in place with the Middle Income Direct Install Program in the next program cycle.

Marketing

PG&E does not market the Energy Savings Assistance Program/Middle Income Direct Install program separately from Energy Savings Assistance Program.

Integration Effectiveness

PG&E's Energy Savings Assistance Program/Middle Income Direct Install program is working well according to the interview. The program achieves a seamless delivery of services to this customer base.

The program cycles for the Middle Income Direct Install program, however, differs from the cycle for the low income program. The low income cycle ends in December the year ahead of the Middle Income Direct Install program. For the next cycle the team will need to create maps from census data that include the past cycle participation data and identify the penetration data from Energy Savings Assistance Program and the Middle Income Direct Install program to-date.

Using the maps, the programs can identify gaps in the coverage due to the lag in program cycles. Specifically, the challenge will be for the contractor to continue to meet the program goals for both the Energy Savings Assistance Program and the Middle Income Direct Install program when possibly faced with low-to-moderate income neighborhoods where the Middle Income Direct Install program continued after the Energy Savings Assistance Program is suspended (the program team asked to extend the Energy Savings Assistance Program cycle to June to try to minimize the lag). As stated earlier, the success of the program depends on using the existing delivery structure to implement both programs.

The program manager for the Middle Income Direct Install program was also the program manager for East Bay Energy Watch, the Multi-family Integrator Pilot Program, and the Comprehensive Audit Innovator Pilot Program, and supports the Green Communities Greenhouse Gas Inventory contract. The PM spends about a quarter of her time on the Middle Income Direct Install Program because it is tracked in a completely different database than what is used internally for EE. The Middle Income Direct Install program is tracked in Energy Partners Online, a low-income database and it takes a little more time to manage. However, the metrics tracked is consistent with the metrics tracked for Energy Savings Assistance Program which include the number of households served and energy savings by kW, kWh, and therms.

IDSM Knowledge

While the Middle Income Direct Install program does not currently integrate across multiple types of DSM, the team is looking to add DR to its program. The guidance to begin looking at integrating DR into the Middle Income Direct Install program came from the manager of the local government programs. This guidance was born out of knowledge picked up during the IDSM training sessions where the Local Government Partnership manager became aware of how Smart AC is delivered through the Energy Savings Assistance Program.

Budget and Spending

According to the interview, the program is at about 80-90% of the budget and is on-track for spending the entire budget this year. They are hoping to add funds to Middle Income Direct Install program this year. The Energy Savings Assistance Program was extended through June 30 pending PUC approval of their next program cycle. The Middle Income Direct Install program is on that same time table. PG&E extended the current Energy Savings Assistance Program contractor's contract through June 30, and reduced the program coverage to two counties pending additional funding expected towards the middle of the year.

2.2.3 Zero Net Energy Pilot

PG&E is conducting the Zero Net Energy pilot to be responsive to the elements of the strategic plan that call for Zero Net Energy (ZNE) for all new commercial buildings by 2030 and all new

residential buildings by 2020. The pilot was to advance technical, educational, and outreach efforts to the building design community and to also do an assessment and analysis of various issues germane to advancing ZNE.

The funding for the pilot ends at the end of 2012. According to the interview; PG&E is looking at whether to maintain an integrated ZNE pilot or disperse the program across multiple program elements. A dispersed ZNE would mean that PG&E would provide technical assistance to get to ZNE; however they may no longer study ZNE policy. According to the interview; PG&E may (in theory) disperse the architectural design competition and a series of classes but from the interviewee's perspective, this could result in lost focus on the larger picture for ZNE.

Effectiveness of Integration

ZNE is probably the only PG&E pilot that was designed with IDSM in mind. To reach zero net energy, EE will be used to drive down the building loads and then DG will generate energy for the remaining load. DR as part of ZNE is more challenging since the program cannot sign customers up for DR until you have an actual customer in the building. One approach to address DR mentioned during the interview; is to try to incorporate features into homes that enable DR during the design phase. For commercial buildings, the consulting work of the ZNE program is also during the design phase, potentially years before the building is occupied. The chief integration opportunities for DR are in the building control systems. At the present, however, the dominant integration factors are EE and DG. The ZNE team looks at everything efficiency-related and the DG incorporated is almost always solar PV or solar hot water. At the building or community level there usually are no other renewable options with the rare possibility of wind.

According to the interview, integration for ZNE does not mean integration of utility programs. ZNE applies integrated building design, which means designing the building shell so it works in a complementary fashion to HVAC and lighting systems. The ZNE team looks to design the building shell for good day lighting and ease of natural ventilation. Inside the building they design to take maximum advantage of thermal mass so the building control system can anticipate how to take advantage of it. Integrated building design refers to the cross-disciplinary design of building systems; not exclusively EE. For example, the ZNE team consulted on the West Berkeley Library design with the Savings by Design team where the project had to trade off day lighting apertures against placing PV on the roof. The integrated building design for this project incorporates multiple elements of DSM. The building has not yet been built. When built, if the integrated element is not included, it will be because of the cost of the DG.

Successes and Challenges

The ZNE team sees EE and DG as the two major areas where integration occurs. The ZNE team has successfully completed nine consultations, with three at the community level, including a

2200-unit development in West Sacramento. This was a successful district-level project that included the street layout and multiple, individual buildings.

The team's success comes mainly from its consultations on projects. For example the team successfully consulted on a project with the Oakland Unified School District at the Fremont High School where the district decided to do a prototype classroom with very detailed day lighting work that can be integrated by the school's design team going forward. But they do not know exactly where they will put the prototypes or when.

A key challenge mentioned during the interview is being out of phase with the customer's project timeline. The team is finding the short time frames associated with regulatory filing cycles problematic with the long timeframes of construction projects. The ZNE team focuses on upfront design consultation advising on daylight, natural ventilation, and other high efficiency options to bring the building 45% below Title 24. When the customer is ready to pull the permit, they can go to Savings by Design (SBD), but there is uncertainty regarding what SBD will be offering in the next filing cycle.

Managing and reporting

The ZNE reporting is primarily on how many consultation reports they have completed. The program target is nine consultation reports. According to the interview, the team has completed nine consultations (reports are to come later). The team has the objective to disseminate whatever it learned from the consultations; the interviewee believes this will probably be done with a case study. The team also has a requirement to conduct assessments, in this case that will be the two EM&V studies funded with utility side EM&V dollars. Finally, the team has a requirement to conduct outreach and education on ZNE. This is achieved through classes at the energy centers (residential classes are held in Stockton). Also, according to the interviewee, the ZNE workshops/seminars achieve very good scores on the pre/post surveys conducted by the energy centers.

Other metrics the team tracks are the 16 different deliverables. Ultimately, it will track kBtu/sf performance achieved, but these savings are achieved with x lighting, y HVAC, and z plug load reduction. The end-use savings will not put it in the Marketing Decision Support System; it will be tracked separately. PG&E has not developed this tracking system.

Marketing

The ZNE team states that since it is required to complete only nine consultations there is no need to conduct marketing. The team may wish to have public meetings at the end of the pilot to publicize and share its findings. The only marketing for the ZNE pilot is for educational classes at the energy centers.

Knowledge and Guidance

According to the interview, it was always PG&E's intent to integrate EE and DG to reach ZNE and this was emphasized in the Advice Letter PG&E filed.

Budget

The ZNE team rebalanced the budget from \$11.5 million to approximately \$6 million. The pilot has spent \$1.7 million. The interviewee believes that there has been so little spent because ZNE is a pilot, non-resource program. The team believes it should come reasonably close to the revised \$6 million budget given that a lot of the work is back loaded.

2.2.4 Green Communities

According to the interview, PG&E had intended the Green Communities program to be a program, but in the final decision it was identified as a pilot and placed in the IDSM bucket. The interviewee does not think the program is designed as an IDSM program and sees limited opportunity to integrate IDSM offerings.

The Green Communities program primarily focuses on the different steps in the climate action planning process. The steps are: 1) develop Greenhouse Gas (GHG) inventories, 2) assist with government facility benchmarking (a side effort), and 3) assist local governments develop Climate Action Plans (CAPs). The energy portion of Climate Action Plans is the program's only opportunity to introduce an integrated approach as part of their review of deliverables from local governments; (i.e., ask if they have thought about solar or low income). The interviewee stated, "We're funding local governments to develop their Climate Action Plans, reviewing their work and offering suggestions and strategies. Accepting our suggestions is up to them." The Green Communities program has two implementation channels; 1) the data team primarily focuses on delivering the steps 1-3; and 2) the community energy managers (CEMs) who are embedded with the account representatives who help the local governments implement their Climate Action Plans. The program, however, is not doing as many Climate Action Plans as they are developing inventories since the inventories are the first step in the process. The community energy managers work directly with the local governments on other government facility projects.

According to the interview, the primary objective of the Green Communities program is to help local governments take a long-term strategic approach to their GHG reduction and how the EE programs can help local governments achieve those reduction targets. Integration of DSM is not the primary focus of Green Communities. The Green Communities Program is helping the local governments move through the Climate Action Plans steps from inventories, data, to Plans. If the Green Communities program continues to the next cycle, they can help local governments with plan implementation where there is some potential for IDSM. The program's primary

purpose is to help local governments develop Climate Action Plans so they can develop a strategy where PG&E programs will fit.

Effectiveness of Integration

According to the interview, whether the local government will develop a Climate Action Plan that will include integration depends on the local government. Some do not want to develop a plan at all because it is a public document that the government is committed to fulfill. Some do not want to develop a plan with a lot of detail; the plans are not going to specify technologies or measures. As the program moves into future program cycles, the program team is considering offering to help develop a desktop plan; one that is not available for public consumption and could guide the local governments toward PG&E's programs.

Unlike other programs that are done at the building scale, Climate Action Plans are on a community scale. The interviewee provided a description for how the Climate Action Plan development could play out and possibly include IDSM strategies. For example, City X is developing their Climate Action Plan and the Green Communities program is providing review and guidance. The City's plan calls for GHG emission reduction of 5% by 2020. They would look at the different segments within the community. The team's review could look at integrating EE in a straightforward way by looking at the City's commercial sector, retail versus data centers or manufacturing. Their review could point out that 5% of the commercial sector is data centers and represents 20% of their load; they could then steer the City to PG&E's data center programs. For DR, if they have substantial air conditioning load given their climate zone the team may point them to Smart AC for residential customers. If they already have a lot of rooftop solar in the commercial sector the team could show how an increase would reduce emissions. That is how the team would bring in IDSM at the Climate Action Plan level.

Integration could also possibly come through the Statewide Energy Efficiency Collaborative (SEEC). This is a subset of the Green Communities program where the IOUs are working with three Non-government Organizations to develop either electronic tools or provide education and peer-to-peer networking opportunities for local governments as it relates to EE opportunities. According to the interview, while the purpose of the Statewide Energy Efficiency Collaborative program is not necessarily to integrate utility offerings, it could promote DG, DR, and low-income programs in addition to traditional EE within the tools they are developing to help local governments develop Climate Action Plans. The interviewee also believes local governments may also work with third parties for integration, especially if they are including solar in their climate action plans or solar is present in their communities.

Successes/Challenges

How much influence the Green Communities program may have in encouraging IDSM in Climate Action Plans depends on how visible the local governments want to be with their commitments to their community. Once a local government has a Climate Action Plan in place, the community energy managers look for integrated approaches to help them reduce their emissions. They look at different ways to focus on the segments of a particular community that offer the greatest potential for GHG reduction. They also help communities understand how many participants already participated in solar programs and how much potential is left. They work with the more advanced communities and really focus on integration.

For the quarterly IDSM report the team reports on three categories: 1) data – municipal GHG inventories and community-wide. The goal is to provide 30% enhanced data by zip code or industrial classification code. 2) Benchmarking in the Association of Bay Area Governments region – the goal is to increase the number of governments participating in benchmarking activities and number of government facilities that are benchmarked. 3) Fluorescent lamp recycling – the Green Communities program provides marketing support for communities that provide CFL recycling centers. According to the 2011 fourth quarter report and the interviewee, the Green Communities program is meeting expectations on the reporting categories. None of the reporting categories has a direct link with IDSM.

Marketing

The Green Communities program team has not developed any marketing or outreach materials specifically branding Green Communities. The Green Communities team wanted to incorporate any marketing into what PG&E currently provides for local governments through their Sustainable Communities. They have also incorporated language on what Green Communities offers into PG&E's Sustainable Communities' website. Unlike typical EE programs where individual customers can take up a program at any time, the Green Communities program will work with regional partners like the Great Valley Center or Association of Bay Area Governments to help recruit a number of local governments at one time. According to the interview, the Green Communities will work with Great Valley as part of their International Council of Local Environmental Initiatives partnership to take local governments through training as a whole group to develop the inventories in a particular matter. If a city were to come to the team as a one-off they would not necessarily have a way to provide the services to them effectively. The team relies on local partners who know the local communities.

Knowledge and Guidance

According to the interview, the team did not receive any guidance through PG&E to establish the Green Communities program as an IDSM program or pilot specifically. However, the

interviewee acknowledged that in general it is ingrained in each employee that PG&E is trying to integrate all of its demand-side offerings for its customers.

Budget

The Green Communities has spent \$8.6 million to date out of a \$15 million budget for the program cycle. The interviewee believes they may not be able to spend the entire budget by the by cycle end. The cycle expires in December 2012 and any remaining budget may be reallocated to those who need it.

2.2.5 Pilot Program Conclusions

PG&E did not design its pilot programs to meet the CPUC's initial objective to have integrated pilots that can demonstrate how to deliver programs that are bundled with at least two or three DSM options (EE, DR or DG) except for the ZNE program. The CPUC was looking for the pilots to provide a test bed for developing a cost effectiveness methodology and possibly an evaluation approach for integrated programs. The SmartAC/Energy Savings Assistance Program meets the bundled integration hurdle (i.e. DR with EE), has participants, and may present a good opportunity for conducting an assessment of the costs effectiveness of integration across more than one DSM approach.

PG&E's ZNE and Green Communities integrated pilot programs facilitate integration. These pilots, however, do not currently provide the test bed for a comprehensive evaluation or assessment of cost. The ZNE and Green Communities look to bundle multiple DSM approaches, but neither pilot has participants at this point that have implemented integrated actions. Energy Savings Assistance Program/Middle Income Direct Install program has participants but the integration is primarily in the delivery approach of EE not integration across multiple types of DSM.

2.2.6 Recommendations

Specific recommendations to consider for the CPUC and PG&E to consider for the above pilots include:

SmartAC/Energy Savings Assistance Program Pilot

- CPUC should now recognize this pilot as a program since PG&E plans to continue offering this delivery strategy going forward into the next cycle.
- The CPUC should conduct an evaluability assessment to determine if the SmartAC/Energy Savings Assistance Program pilot presents an opportunity to assess the cost effectiveness of bundling a low income program with a DR program; it should also use it as a test bed for evaluating an IDSM program.

- As PG&E explores expanding the SmartAC Affiliate pilot into other potential EE program areas, such as partnering with Best Buy as an affiliate for SmartAC, PG&E should work with the ED and its consultants to establish a framework for assessing cost effectiveness and evaluating outcomes for bundled IDSM.

Energy Savings Assistance Program/Middle Income Direct Install Pilot

- Due to the lack of integration across types of DSM, it is not clear that this is an IDSM pilot.
- CPUC should now recognize this pilot as a program since PG&E plans to continue offering this delivery strategy going forward into the next cycle.
- The CPUC should work with PG&E to help line-up the funding schedules for Energy Savings Assistance Program and EE to assure there are no gaps in implementing the integrated program.
- Given the success PG&E has experienced with the delivery model of having the Energy Savings Assistance Program contractor explain and sign customers up for SmartAC, PG&E should move forward as scheduled with bundling SmartAC (DR) with Middle Income Direct Install and potentially with SmartRate (a Time-Of-Use rate). As part of this process PG&E should work with ED and its consultants to establish a framework for assessing cost effectiveness and evaluating outcomes for bundled IDSM.

Zero Net Energy Pilot

- PG&E should initiate discussions with the CPUC to explore possible amendments to the current policy rules that limit program eligibility for ZNE projects. The CPUC and the IOUs should discuss the development of a “pre-application with some reservation for funding” for ZNE projects that are based on proposed plans derived from consultations. The pre-application reservation would encourage customers to move forward with plans where work may be completed beyond the current three-to-four-year limit.

Green Communities Pilot

- PG&E’s IDSM team should begin including metrics on the status of Climate Action Plans (i.e., initiated, completed, and integrated) and any potential energy and GHG savings that may be addressed in the Climate Action Plan as part of its quarterly reports.

2.3 IDSM Emerging Technologies

2.3.1 Integration-Enabling Emerging Technologies

PG&E has several integrated enabling technologies that are either undergoing an Emerging Technologies (ET) assessment or recently completed an assessment. PG&E anticipates completing most of the assessments by the fourth quarter of 2012. Below are descriptions of the integrated technologies currently undergoing assessment as either a demonstration showcase or scale-built placement.

- *Agriculture Irrigation Optimization Tool* (technology assessment; integrates EE and water) senses the moisture in the soil and can shut off irrigation, saving electricity as well as water. This project experienced a delay when the customer pulled out and the team had to find another customer for the demonstration site.
- *Foodservice Demand Response Ice Machine* (demonstration showcase; integrates EE and DR). These ice machines have a timer to set the production of ice during off-peak periods.
- *Contra Costa County Integrated Occupancy Sensor Project* (scale-built placement; integrates EE and DR). These controls, for residential and small businesses, not only shut off lighting, but are DR-enabled.
- *Home Energy Management System* (scale-built placement; integrates EE and DR) will provide energy saving messaging via mobile phone messages and a web portal so customers will be able to program or turn down their thermostats. The technology is not DR-enabled; the goal is to promote behavior response to timely messaging. This is a combination of the Opower mobile phone app and programmable thermostats with messaging capability.
- *Zero Energy Classroom* (demonstration showcase at the Stockton energy training center). This demonstration will provide training to the trades on ZNE. The demonstration integrates EE, DR, and PV.
- *Lighting* (demonstration showcase at the Energy Training Center; integrates EE and DR); lighting dimmer controls that allow for dimming beyond normal for DR applications. Will have a control panel that is DR-enabled that can accommodate remote control.

Completed assessments include:

- *Water Energy Pilot* (technology assessment; integrates EE and DR) a feasibility study for implementing an energy-pumping optimization algorithm through a Supervisor Control and Data Acquisition (SCADA) System using real-time energy consumption data.
- *Heat Pump Water Heaters* (technology assessment) integrates EE and DR capability.

IDSM Knowledge for Emerging Technologies

Incorporating technologies that allow for integration across multiple DSM platforms is a priority for PG&E's emerging technologies team. The team uses an Emerging Technology Opportunities Summary screening template to conduct a paper review of possible technologies. Technologies that include both EE and DR capabilities are given more weight in the screening. A key challenge to the team is to identify technology opportunities that address DG. A key barrier is a lack of funding to support research and assessment of DG technologies. The EE guidelines that determine emerging technology funding does not include and/or allow for funding DG activity and the DG team dedicated its funding early on for certain large-scale projects and did not set aside funds to work with emerging technologies on smaller projects funding to support the integrated emerging technologies activities.

The emerging technologies team will look for opportunities and resources to fund DG. The emerging technologies team is working on a ZNE modular classroom as part of the Workforce Education and Training (WET). It is looking for other resources, such as the CEC, to provide the DG training portion for this project.

Proof of Concept

PG&E successfully established proof of concept for the heat pump water heaters with EE and DR capability and the Water Energy Pilot with real-time monitoring based on energy use data supplied to the water agency SCADA system. Both the technology and the monitoring approach are now offered in PG&E's portfolio. Proof of concept was determine via lab testing for the heat pump water heater and the Water Energy Pilot proof came from technology assessment collaborations with San Jose Water Company (SJWC) and East Bay Municipal Utility District (EBMUD).

According to the interview, the team does not see any additional challenges or barriers to determine proof of concept for DR. As with EE, the focus is on assessing whether savings are occurring. The team will conduct additional field testing for DR to assess signals and/or equipment response.

For the current projects, all are undergoing some form of testing proof of concept for energy savings except for the Home Energy Management System. Since the purpose of the application is to promote behavior change the proof of concept will rely on experimental research approach using control groups and other scientific methods for evaluating the ability to create behavior change. This assessment is not included in PG&E's ongoing assessment for behavior change using comparative feedback reports currently underway with Freeman, Sullivan Group (FSC).

Inclusion of Integration-Enabling Emerging Technologies

Both the Heat Pump Water Heater and the Water Energy Pilot are now offered as incentive programs. The heat pump water heater is capable of delivering energy savings for both EE and DR. However, since the heat pump is very efficient the savings from DR are less than what was expected. According to the team, this is typically the case with any EE/DR integrated project. It is very difficult to obtain and/or maintain the level of DR that is anticipated when coupled with EE. This sometimes creates an internal challenge for EE and DR programs when the DR program has specific goals to achieve. However, the two teams are motivated to work this out given the senior leadership's directive for IDSM technologies.

The major barrier for integrated technologies that are included in the portfolio is the added costs to customers who purchase the technologies. For instance, the heat pump water heater is double the cost compared to a standard water heater.

The emerging technologies team has followed the core program elements when assessing integrated technologies. It tries to break out the projects by the sub-program elements (i.e., technology assessments, scaled field placements, demonstration showcases, market and behavior studies, technology development support and business incubation support.) The only sub-program element without an integrated technology is "technology development support" since this program element is more related to just EE and providing support for setting baseline standards.

There is one area where the emerging technologies can seek opportunities for developing integrated technologies for DG. The "business incubation support" is where the emerging technologies will conduct outreach to new entrepreneurs to explain the integrated emerging technologies program so they can have a better understanding of what the program is trying to accomplish. In return, the team hopes to solicit partners who will provide funding for co-managed projects.

2.4 Integrated Audits (Residential and Nonresidential)

2.4.1 Program and Integration Goals

The Audit team develops and provides tools for conducting residential and non-residential audits. These tools include customer Do-It-Yourself audits available to customers online (or via mail), customer-representative assisted phone audits, and contractor-delivered on-site audits. The goal of the audits, according to the interview, is to educate customers and help them understand how their energy use impacts their pocket book. This includes minimizing unproductive energy use and cost-effectively investing in efficient equipment. It also educates customers on how to lower their average cost per kWh by timing energy use through the day, and

helps them understand the bigger end-uses that drive their bill. The interviewee stated that audits provide actionable recommendations and integrates EE, DG, and DR opportunities.

The Audit program is currently developing a progressive energy audit tool (PEAT) suite. This moves away from the traditional static, one-time audit or survey and towards a continuous improvement or progressive approach that promotes integration. Both the residential and non-residential applications in the progressive energy audit tool suite use customer AMI data from SmartMeters. This tool is easily available to customer through PG&E's "My Account" web portal and allows customers to see both the output of their usage and a representation of how that breaks down into key energy end-use components. It allows them to see recommendations across EE, DR, DG, and water that span from behavioral recommendations to programs that may be beneficial to them, including items where rebates are available. Customers may take a hands-on approach in managing their bills by answering questions about how they use energy; they receive in turn recommendations specifically driven by information from their smart meter as well as their answers.

For large non-residential customers, typically 500 kW annually or bigger, PG&E account reps offer the large, integrated audit. According to the interviewee, an outside engineering consulting firm works with the customer to dig into their operations, inventory equipment, and put together a series of suggestions for EE, DR, DG measures. The plan includes cost information, payback information and often a bundled set of products or measures to help them understand the loading order and ramifications for implementing these measures. For smaller customers between 200-500 kW, PG&E offers on-site audits, conducted in-house through the customer solutions operations team in PG&E's Energy Solutions and Sales organization. These audits are typically not as thorough as the large, integrated audit but have a faster turnaround.

According to the interview, the audit program does not have explicit integration goals; the team works to achieve the audit targets set forth in the residential, commercial, industrial, and agricultural Program Implementation Plans, which do not specify integration in any particular way. The Energy Solutions and Services organization, which delivers many of the audits, has added targets for the account reps for number of completed audits this year. This is with the intention of having the reps engage in conversations about the benefits with time variant pricing; they may also discuss the EE, DR, and solar opportunities that make sense to support their success on a time varying rate. The overall goal is to assure integrated information is being provided to the customer.

When asked to discuss the incorporation of feedback from external stakeholders, the interviewee was unable to come up with any specific instances, although the interviewee acknowledged that they are often in conversations with third parties to make sure there is consistency between the audits being delivered.

2.4.2 Integration Resources and Support

The interviewee noted that the audit tool was an important resource for integration. The progressive energy audit tool—both residential and small business versions—is linked to a solar calculator which sizes a customer’s solar needs depending on whether they intend to implement EE measures. Because the integrated audits were also partially funded through the DR program, DR is also incorporated. The audit team works closely with the marketing departments on the goals and accomplishments of the marketing, with a particular focus on education.

The interviewee acknowledged that integration objectives had progressed significantly in the past year. The program is currently in the process of evaluating and replacing a number of audit tools. The new tools being developed are integrated from the ground up.

2.4.3 Program Incentives

When discussing program incentives, the interviewee could not definitely say whether the incentives were adequate, but revealed that it was a topic of internal discussion. The interviewee suggested the option for a higher incentive for multiple projects or continued engagement measure after measure. A graduated rate could be analyzed in terms of cost-effectiveness to see if it would make sense to provide more money for integrated programs or whether something else is needed. However, the interviewee did concede that the operational requirements this would entail might increase the administration costs and burden of the program to a degree that is not as cost-effective.

2.4.4 Internal/External Integration

The audit program is highly integrated with other programs at PG&E. The audit team is in the Products organization and works closely with the other product managers for each technology family (lighting, HVAC, etc.). For example, the Audit Product Manager works closely with the HVAC Product Managers to make sure the HVAC products they are identifying as critical for customers are being reflected in the audits. Similarly, the product manager for the progressive energy audit tool is working with the DR product managers to make sure DR options (including SmartAC) are showing up as recommendations in the results.

The online audit is designed for smaller customers. The audit attempts to pick out the program that is most applicable based on the information entered. The tools pick out measures that are low or no cost, measures that similar customers have already done successfully, and are attuned to climate in geographic areas. The tool, however, is unable to give customers a more accurate estimate of savings if a combination of the measures is implemented. Larger customers are more likely to have an active conversation with a PG&E representative or consultant, who can demonstrate to them the proper progression of moving from EE to DR, and how this affects costs and savings. These custom audits bundle recommendations and provide savings potentials.

The interviewee discussed some ways in which they worked with other utilities and programs. For example, the City of San Francisco decided last year that a certain number of businesses needed to get an energy audit done, either through PG&E or elsewhere. There were a number of PG&E products that served that need, and if customers were to engage, PG&E would be able to help take those recommendations and translate them into action.

2.4.5 AMI Integration

The interviewee reported that the audit program is very integrated with the SmartMeter/AMI deployment. AMI data available in the on-line tool shows the customer their actual usage and a comparison to other similar customers in their area. The residential progressive energy audit tool will be updated soon to feature a pie chart that will show customers their disaggregated usage, with heating, cooling, and “other” as primary end uses. The large integrated audits have the ability to pull data from the Interact meter system, and the consultants have experience using that data to drive customer-specific recommendations.

2.4.6 Tracking and Evaluation of Integration

The interviewee was not aware of cross-program tracking of EE, DG, DR, and AMI enabled programs at the site or account level to determine the level of integrated participation. The audit program tracks EE and audit participation, and other programs track their participation. The interviewee admitted that they have not had great success with tracking audit recommendations back to specific customer implementations due to limitations in the software and databases that were set up for residential audits in years past. Though the program attempted to track the conversion rate from recommendation to action, the granularity of data was not available for specific customers and specific recommendations. The progressive audit tools currently being rolled out will have this feature.

2.4.7 IDSM Knowledge Enhancement

The interviewee attended PG&E’s integration workshops. The workshops provided a good foundational overview of integration, as well as opportunities to interact more with the different parties and programs who serve their customers. The workshops provide a platform to share knowledge on what is working.

The audit team did not receive specific guidance regarding integration of DSM technologies, though the interviewee acknowledged that it was implied. The guidance that the audit team focused on was the customer perspective; figuring out who the customer is and how to best fulfill their needs, rather than selling a particular widget. Integration comes naturally.

When asked if there were any specific areas of training they would like, the interviewee requested more information on the ways that customers were successfully taking advantage of

DR, DG, and EE. If they have those stories then the team would be able to train internally with this information.

2.4.8 Marketing Materials

On the discussion of marketing materials, the interviewee acknowledged that the existing collateral for the large integrated audits was developed a couple of years ago when integration was not as prominent a concept. They were currently collaborating with the marketing team to develop new marketing collateral. In particular, the audit team recognized the importance of the energy solutions and services team understanding the value and opportunity of the large integrated audit product. The energy solutions and services account representative is the audit team's direct customer, and PG&E customers are the direct customers of the energy solutions and services team. It is the energy solutions and services representative who must understand the options available to the end-use customer in order to get them to commit to energy management, and therefore the marketing is directed primarily at energy solutions and services reps.

For the more traditional audits, the team markets directly to the customer. With the new residential and non-residential progressive energy audit tool (PEAT) suite rolling out this year, the audit team will be doing more marketing as the roll-out proceeds. The marketing manager reported that the team is completing foundational work to convey a clean and clear message about the audit services. The work includes an extensive clean-up of the pge.com website, including keyword meta-data so customers may find the Audit Services home page. There are also three new datasheets going to print, which echo the same format as the web, and will be delivered to customers by the account reps. In addition, the team is completing three new customer videos that will be available on PG&E's website and youtube.com.

2.4.9 Integration Successes and Challenges

An integration audit success was the use of the BEST (Business Energy Survey Tool) audit tool, for both integrated and non-integrated audits. With this tool, the discussion between account representative and customer includes opportunities for solar, DR, or EE. If DR and/or DG measures are included in the report, it is reported as an integrated audit. This is a small but crucial improvement in the audit program's attempt to track integration.

The interviewee also listed the collaboration between the audit program and the DR program as a success story. The audit team works with the DR programs to help drive DR participation by building more DR capabilities into the audit tools.

The interviewee provided some perspective on what changes could be made to help improve integration. Because the large integrated audit is custom and personal, the program is able to fold in feedback from their customers immediately for the next audit. For example, they received feedback that customers felt it took too long to get the audit recommendations. PG&E

revised their protocols so that they were able to shorten the timeframe and get information to the customer more quickly. The interviewee also suggested that direct funding for the development of audit software from the different programs would also help.

When asked to discuss the customer segments most likely to pursue integrated solutions the interviewee pointed out that the agricultural customers are more energy-savvy and were more interested in looking at all their options related to energy management. They acknowledged that, anecdotally, solar does not work for commercial buildings because they do not have the roof space, and hospitals are also significantly less likely to participate in DR due to strict operational requirements.

2.5 Account Managers Summary

Account managers oversaw the completion of 88 integrated projects from 2009 through the end of 2011 (applications closed in 2012). The breakdowns for these integrated projects were as follows:

- 43 of the projects integrated EE and DR
- 18 of the projects integrated EE and DG
- 27 of the projects integrated EE, DR and DG
- 13 of all projects also included Climate Smart

2.5.1 Integration Resource and Support

Account managers were questioned about the resources made available to better offer integrated programs. The managers were very enthusiastic about the marketing collateral and web-based program information. The ongoing newsletters and trainings better equip account representatives to offer integration to customers. Several managers expressed the importance of leveraging integrated case studies and that having specialized personnel on staff were invaluable. Having an energy solutions manager who could perform calculations, conduct pre-inspections, and generally provide assistance with complex energy projects was critical.

Often, the programs provided the necessary support. The account manager for government and community partnerships identified the inherent program structure as a valuable resource. For instance, the program's "statewide EE partnership" with the State of California is their number one tool; it allows the account team to offer integrated programs simply by sitting at a table with the decision-makers. The account managers for the healthcare and technology segments stressed the importance of pursuing integration in new construction with the Savings by Design program.

The account managers want more direction from regulators to PG&E's customers on the loading order of energy. They believe it should be common knowledge to any customer considering an energy project that EE and DR are the first steps to consider before attempting other, flashier options. This message should come from PG&E and the PUC and/or the CEC; it should be clear that the loading order is not just based on PG&E's own interests.

Timing repeatedly arose as a barrier to integration. Project reviews and regulatory processes seem to add unexpected delays, and often the project goals and program cycles are not aligned. One account manager complained that it was frustrating to spend months convincing a customer to engage in a project, only to have that program funding run out once they have decided to pull the trigger.

2.5.2 Application Process Integration

Account managers were generally unimpressed with the application process. They understood that the applications themselves were still separate, though they acknowledged DR and EE had seen some progress. In particular, the application process for new commercial and industrial construction was called out for being poorly integrated, though the retrofit process was more supportive of integration.

2.5.3 Use of Marketing Materials

Account managers have access to a catalog of various factsheets on IDSM opportunities. This catalog also includes case studies of successful projects. When asked to rate the effectiveness of the marketing materials on a scale of 1 to 5, with 5 being the best, responses ranged from 3 to 5, with an average of 4. The account manager for the commercial/industrial segment rated the quality of the materials to be 4.5, with the overall array of collateral being 3.

Overwhelmingly, account managers said that direct contact with the customer was their best tool for IDSM. Knowing their customers, understanding their business needs, and developing long-term relationships led to the greatest level of success in enacting integrated projects. It is important to provide customers with a single contact at PG&E. Once the customer understands their energy portfolio, high level conversations about integration begin, and the marketing collateral that are program- and measure-focused are brought in. Account managers also found it helpful to develop outreach plans for all customers based on seasonality.

The most effective marketing collateral was measure-specific. Account managers often used case studies, technical briefs, and other materials customized to the measure or business operation. The marketing strategies most commonly employed by account managers included regular contact/meetings, targeting mailings, and attendance at conferences and customer events.

Each account manager had segment-specific suggestions for improving marketing materials. The program manager for the government and community partnership segment requested that the state help push information to state agencies. If the governor wrote a budget letter that endorsed PG&E's on-bill financing program, agency heads would be more likely to cooperate because they follow executive orders and senate bills. The healthcare account manager requested more materials that promote Savings by Design for new construction. The account manager for higher education developed a comprehensive suite of tactics that included marketing at football games in an effort to influence campus culture and curriculum.

2.5.4 Internal/External Integration

Account managers were asked to discuss the programs that were most commonly incorporated into integrated solutions. The account managers acknowledged that the large integrated audits were crucial for administering the solutions suggested for their customers. The account manager for the healthcare and hospitality industry even asserted that they performed integrated audits when working in new construction. The account managers acknowledged that they tried to integrate demand-response when possible, but they were typically limited by the demands of the customer. Healthcare and commercial customers were most unlikely to implement demand-response, due to the inherent nature of the business/industry. Within customers who were open to DR, lighting and HVAC were typical pairings.

Account managers reported that their customers commonly worked with outside utilities, particularly in the high-tech field, whose customers often have branches in other states. The high tech customers often worked with utilities on the East Coast, where similar EE and DR programs are offered. Account managers for the government and community partnerships often hand off state government projects to other local government partnerships.

2.5.5 Integration Successes and Challenges

As stated earlier, PG&E has tracked 88 integrated projects from 2009 through 2011 that have been implemented by account representatives. Of these projects, several have been recognized with awards at the annual regional sales training event.

- In 2010, 18 awards were given for 2009 efforts; 7 winners integrated EE and DR; 3 integrated EE and DG; and 8 integrated EE, DR and DG
- In 2011, 13 awards were given for 2010 efforts; 5 for EE and DR, 2 for EE and DG, and 6 for EE, DR and DG
- In 2012, 9 awards were given for 2011 efforts; 4 for EE and DR, 1 for EE and DG, and 4 for EE, DR and DG

All awarded projects included EE/audits combination along with integration of other programs and some included benchmarking.

- **State Agencies**
 - **Caltrans Bridge Lighting.** Received special award in 2010. This project included LED streetlight replacements on the Richmond and San Mateo Bridges; retrofits for Amber Alert signs; new construction. The project did not fit into a typical building category. Even though these are large and deep energy saving projects, it is not in the manual and it was hard for people to make decisions on it. State agencies are challenging customers because they have unfunded mandates, so it is necessary to be as knowledgeable as possible to secure funding. PG&E was the first IOU to get language approved by the state Department of Finance so it could offer loans; it is also coming up with multiple payee options.
 - **Caltrans Solar Installations.** They independently received a California Renewable Energy Bond (CREBS) for their solar installations at 30 sites. PG&E then worked with them to perform the EE audits and connected them with their local government partnerships who do a direct install program for lighting and HVAC. This was a success story due to a combination of financing and having one point of contact that could put them in touch with all the right departments.
- **Kaiser:** Received a special award several years ago. Kaiser was a sophisticated customer that wanted a high level portfolio approach that was very cost-conscious. It looked at doing 1MW PV installations on parking structures, put some good support around doing operational RCx energy savings projects, and implemented hospital-wide EE projects. Despite hospitals not traditionally employing DR, Kaiser was open to considering it in non-ER and admin areas.
- **UC Davis:** PG&E recently worked with UC Davis on the construction of their new West Village development, a mix of residential space for students, multifamily, and retail space. The facility went through Savings by Design and set zero net energy goals.

2.5.6 Successes and Barriers

Account managers identified several techniques that proved to be successful in supporting integration:

- **Case Studies.** Specific success stories that show what worked for a similar customer.
- **High-Level Portfolio Approach.** Once the customer is educated about their energy and demand, it is easier to get the customer to understand the importance of diversifying their energy portfolio and push an integrated approach.

- **Get involved early.** It is easier successfully incorporate integration into a project in the early planning stages. Account managers should keep abreast of projects their customers are potentially considering; often, the help that PG&E may provide in finding funding and integrating energy solutions can tip a customer's decision. For a project that has already begun, it is important to get involved early and identify a higher level director who will become a champion for the energy efforts.

Account managers also identified several barriers to integration. The main persistent barrier was the constant struggle between timing and funding. A customer may decide to integrate two projects but ultimately they happen as separate filings and are subject to different timetables and sources of funding. Despite the best integration intentions, when they reach the back office they turn into different events.

2.5.7 Solutions

Short Term

- Become aware of projects earlier. Get in at the ground level to identify opportunities for energy savings and develop relationships with the customers.
- Appoint leads. Customers should have one single point of contact at PG&E who they have built a relationship with and can go to for energy needs.

Medium Term

- Develop integrated programs. Instead of having piecemeal programs that only reward individual steps, create programs that explicitly require two or more DSM offerings in order to receive the full rebate. Incentives should be based on a whole building approach rather than specific measures.
- Create channeled programs. Develop specialized programs catered to the specific business segment, i.e., restaurants or office buildings.
- Opportunities for PG&E to partner with cities and communities to provide DG.

Long term

- Align strategic and metric goals and merge the programs on the regulatory side so that the customer has the most comprehensive offering possible. Creating one integrated program will also ensure that there are no barriers with the funding streams.

2.5.8 IDSM Knowledge and Enhancement

Account managers were asked to discuss the ways in which IDSM was promoted. No segment reported having set integration goals outside of its typical participation and savings goals. All

account managers regularly attended IDSM trainings. They stressed, however, that their expertise in IDSM came not from the trainings but from their years of experience working in this industry. The trainings provided a chance to fill in gaps in their knowledge.

There was very little response when asked if there was additional training needed; rather, the consensus seemed to be that integration was tough not for a lack of training, but for a lack of quality programs to promote. The only training requested was ongoing training to stay up to date on regulations around topics such as solar and new construction.

2.5.9 Tracking of Integration

Account managers were asked if they track EE/DR/DG options that are suggested to customers in addition to those projects that are actually adopted. While all account managers tracked each program and project adopted and the energy savings attributed to them, it was difficult to track integration. Account managers do not have access to each piece of the puzzle and often have to track down other managers to get it. One manager specifically reported sitting down at the end of every year with the other program managers to aggregate data for their customers. Individual account representatives use the Customer Management Tool to input and track sales leads. Account managers are also able to track the implementation success of audit recommendations. DR, solar, etc, all have separate tracking databases by program. Therefore, though PG&E is not currently tracking adoption of integration, the account representatives believe it is theoretically possible to extrapolate a picture of IDSM.

For successful integration projects, account managers were asked to discuss the process and timeline for integration. The time between implemented components for an integration project ranged from several months to 18 months.

2.5.10 Program Incentives

The majority of account managers interviewed did not feel that the current incentive structure was effective in motivating customers to participant in IDSM. Customers receive incentives for each piece that they enact; the programs are transactional, not holistic. There is no advantage for completing more than one program. They suggested that more customers would participate in integration if there were higher incentives for bundling projects. Additionally, the structure may be changed so that incentives are based on more of a systems or whole facility approach rather than on individual measures.

2.5.11 Financial Incentives Linked to Integration

Very few of the account managers themselves received financial incentives linked to integration. All teams had general performance indicators that typically included internal savings goals.

Meeting goals made them eligible for special awards and recognition. Only the high-tech team received monetary compensation in the form of a “sales incentive” if they exceeded their goals.

2.5.12 AMI Integration

When asked to speculate on the upcoming AMI deployment’s effect on integration, account managers for segments, including commercial and industrial, pointed out that many of their customers have been on time-of-use rates for a while. For government programs and state agencies, Marketing Decision Support System already shows them the mix of energy that their customers are using. Schools were anticipated to have a more difficult time because many campuses have had one master meter; a smart meter will not understand what is happening on an individual building level, and it will have a hard time tracking drivers for individual behaviors such as in classrooms and dorm rooms.

2.5.13 Conclusions

PG&E’s account representatives seem well informed and motivated to pursue integrated projects. They have successfully completed 88 integrated projects through the fourth quarter of 2012. It is not possible to make a judgment on whether these achievements are successful or not since the account representatives do not have any specific targets either in number projects or savings from integrated projects. Plus, there are no studies available to determine what the technical potential is for DG or IDSM in PG&E’s territory. Without targets and/or benchmarks there is no way for the CPUC to assess the effectiveness of PG&E’s IDSM approach either in terms of costs, addressing all IDSM opportunities or in overall savings achieved.

From the interviews, there is a consistent theme that integration sells best when there is some form of personal engagement from the account representative with the customer. Since only the large nonresidential customers have account representatives they can engage with one-on-one, integration for the larger volume of small/medium business customers may prove more difficult. It may be worthwhile for the IDSM task force to assess the IDSM potential for small/medium business customers, what segments present high value, and whether IDSM can be achieved for small/medium business cost effectively.

Finally, the account representatives offered some great insights on where they see opportunities to address integration. They point out that both the CPUC and PG&E define integration as including EE, DR and DG. However, it is not clear whether the expectation is for IDSM to occur as one bundle or multiple adoptions from multiple programs. The representatives point out if there is expectation that IDSM is one program, then PG&E is lacking in a truly integrated bundle. The representatives also think if there are to be bundled programs then the incentives should complement the bundle (i.e., rising incentives for multiple adoption). As it stands now, there is no information available to provide guidance on which definition for IDSM (bundled or

multiple adoptions) provides the best opportunity to deliver integration. This could also be determined from an IDSM potential assessment.

2.5.14 Recommendations

Given the above conclusions and overall summary of the account representative interviews, we provide the following recommendations:

- The IDSM Task Force should commission a study to assess the technical and achievable potential for integrated projects. The Task Force should also commission a valuability study to determine whether it is feasible methodologically to integrate the data from the EE, DR, and DG studies to produce potential estimates for IDSM.
- Depending on the outcome from the potential study (assessment), the CPUC should collaborate with PG&E to establish targets for integration projects and energy savings; and evaluate the cost effectiveness for projects completed.
- Given the outcomes of the potential study and cost-effectiveness assessment, PG&E should develop an IDSM program plan that looks at optimizing the best approach for achieving IDSM by customer and market segments, and by either bundled or multiple adoption approach (or a combination of both).
- Other recommendations from the account representatives the IDSM Task Force and PG&E should collaborate on include:
 - Address delays in approving large projects to help minimize the risk of projects running out of time and funding due to ending program cycles, and
 - The CPUC should investigate the possibility of an educational outreach campaign explaining the societal reasons for IDSM.

2.6 Marketing Staff Summary

2.6.1 Comprehensive and Coordinate IDSM Marketing

PG&E's marketing has two distinct teams. The Solutions Marketing team provides marketing support for nonresidential customers that tend to be very program- and technology-specific. This team develops marketing material that is channeled directly to the customer via workshops, webinars, electronic newsletter, trade ads, etc. The team also develops sales collateral such as the technical factsheets and testimonials. The Marketing Strategy and Regulatory Compliance team provides strategic marketing support and marketing plans that focuses on integration across service offerings and coordinates PG&E marketing messaging with other groups in PG&E. For example, it will develop and coordinate with the company's seasonal campaigns offering tips for winter and summer and the 20/20 gas savings campaigns. The Strategy team develops the messaging for low cost EE tips and raising awareness of Low Income Energy Efficiency

weatherization and gas appliance rebates. It also develops integration message themes pointing residential and nonresidential customers to EE rebates, DR, SmartAC, SmartRate, CSI, etc. These umbrella themes are repeated across various advertising and outreach media (i.e., direct mail, collateral, workshop material, mass media, print, etc.) and are often included in the tactical materials produced by the Solutions Marketing team and in various residential program-specific marketing materials where the integration message is complementary.

PG&E's marketing approach includes a more tactical means of reaching targeted consumer groups about programs and service offerings that are specific to them, and higher-level communications that include overarching themes on "how to save energy" including IDSM offerings. The integrated IDSM themes can be present in both the overarching and tactical marketing materials.

IDSM Marketing Approach

PG&E's IDSM marketing budget does not support mass media advertising. It strategically leverages advertising with the PG&E communications group during the seasonal campaigns and with efforts to educate customers regarding the SmartMeter deployment. This includes incorporating IDSM messaging with recent campaigns such as: *See Your Power (to raise awareness of smart rate, My Energy web portal) Power a Brighter Future (raise awareness of smart meters, time varying pricing, DR events) Breathe Easy Solutions (raise awareness of Energy Savings Assistance Program, CARE rate (California Alternate Rates for Energy))*. These campaigns used multi-channel delivery approaches that included retailers such as Sears, Best Buy (both had kiosk displays), online, direct mail, mobile tour, and TV.

The IDSM marketing team's primary marketing strategy outside of leveraging other marketing is focused on delivering its IDSM message using tactics such as event-based marketing. This was a key approach used in the 2011 campaign which it plans to expand going forward. Key events for last year included the mobile tours and the retailer Kiosks. At such events, PG&E provides a variety of materials to engage the customer including electronic displays such as touch screens for more detailed information on HVAC, DR, solar, etc.

For its larger business customers, PG&E relies on tactical outreach strategies. It relies on a personal contact approach such as workshops for business customers in order to educate them on the breadth of EE, DR, renewable generation, and other program offerings such as energy audits. It recently delivered a series of 10 workshops for wineries on the topics that addressed EE for pumping, renewable generation, and greenhouse-gas-offsets (according to one interview, many of the customers who attended the workshops last year installed solar). It also displays at tradeshows and uses real-time and on-demand webinars, electronic newsletters, and creates videos of successful projects, covering solar, wind, fuel cell, EE and DR. It also places print-ads in trade press magazines.

The marketing team has a catalog of various factsheets on IDSM opportunities via programs and technologies. It also produces factsheets that on successful case studies. This material is available through an online ordering system.

Definition of IDSM Marketing

PG&E defines integrated marketing and outreach as a complementary series of messages about programs, rates, and a variety of other things. Through an integrated approach a customer can get the most impactful savings and optimize their operations. According to the marketing team, its approach is to try to follow the loading order by emphasizing in its messaging EE first then DR and then renewable generation. The team focuses its messaging and outreach towards educating customers on the benefits of a more comprehensive approach where customers can raise the impact of their projects and lower their overall cost.

Developing IDSM Marketing Material

PG&E's integrated marketing has been around for a while; not under the IDSM name, but more oriented around providing a "solution cell". After rebranding the department a few years ago as solutions marketing where PG&E realigned from programs towards customer categories and markets, it shifted its marketing material from program-specific marketing to IDSM marketing. This follows an ongoing philosophy that offering the customer integrated marketing and collateral is good for the customer since it allows the customer to see all solutions together to help them make a sound decision.

Knowledge Source

The marketing team gains technical knowledge to inform marketing materials from the subject matter experts from the products team and from the annual integrated training sessions. The marketing team also provides training/information on the IDSM marketing materials to the various product teams, account representatives, planners, EM&V team, etc. at the training sessions. The solutions marketing team partners with external parties to create technical content for IDSM; recent partners include Labs 21, UC Davis, and Lawrence Berkeley National Laboratory.

2.6.2 Objectives/Available Resources

Developing integrated marketing materials starts with first determining customer needs, campaign objectives, and program goals. The team will work to assemble a plan that can accomplish all objectives. It will look for approaches where programs can be complementary to the integration. For example, PG&E's 2012 Smart Rate campaign targeted Smart AC customers as its first audience since they and the programs share a lot of characteristics.

Cross Functional Teams

The marketing team works with cross-functional team members that represent energy services and solutions (account representatives), government relations, and third party partners. The team taps into these customer facing implementers to make sure the team has a clean and clear line of sight to what is happening in the field – making sure the “customer voice” is represented in the meetings. There is also a cross-functional team that includes the marketing team and the pricing products group. This team is focused on revising the customer’s energy bill statement to reflect an integrated message, since the bill is an initial touch point and encompasses everything from an integration standpoint.

Supporting Research

In 2012 the marketing team began using an integrated research approach. Historically, its approach was to do program-specific research. However, this year it initiated a customer energy solutions integrated customer participation study. The idea was to get a cross-program look at how customers are looking at PG&E’s offerings. The team is hoping to gain more insight into the most popular integration options. The study is recent; however, the marketing team believes it will now have a good resource to see how the different IDSM areas interact.

The solutions marketing team also conducts interviews directly with business customers in an effort to develop an understanding of the customer’s upcoming needs. For example, the marketing team conducted interviews with customers and other entities such as governments to assess their understanding of codes and standards changes. In addition, the team gathered research via interviews with various affected organizations on their knowledge about benchmarking requirements. The team used this information to develop a co-marketing effort with the City of San Francisco to get the word out to companies about a requirement to benchmark the buildings. The outreach included holding workshops over the last two years to teach how to benchmark a building, what to do after you know your benchmarking score, and how a facilities manager can do proper financial analysis for a recommended energy-management project to make the case with his/her company’s decision makers.

IDSM Concept as Holistic Solution

The Marketing department appears to be fully focused on working across the different areas in Customer Energy Solutions to overcome obstacles such as the disparate funding sources for balancing accounts and finding different ways to approach integrated campaigns.

The department sees that customers are at different stages of understanding and applying the benefits from an IDSM approach. Depending on where the customer is on the continuum, the team wants to provide them with material they can use, and recommend actions customers are comfortable to take. Some are beginners. Some have gone to Continuous Energy Improvement

(CEI), which includes not only DR, EE, and DG, but also behavioral changes to multiple campuses. To move customers along the chain, the marketing team is using the Continuous Energy Improvement pilot participants as cohorts where it can assess a group that goes through the training and implementation together. The team uses a Total Management Quality approach where it assesses, improves, then measures, and assesses, improves, and measures again the cohorts to help develop information to bring the customer along on CEI/IDSM journey.

Performance Metrics

Due to regulatory reporting requirements the marketing team carefully tracks various performance metrics to ensure they are accountable for delivering campaign results. The specific metrics vary with the campaign; metrics might be awareness or levels of education around a concept. These types of metrics usually require surveys. For example, the team recently reported metrics on the peak time rebates for winter gas savings on how different outreach tactics were complementary and that a multi-channel approach resulted in more customer savings.

Metrics for the more tactical outreach efforts such as workshops, and email campaigns focus on transactional data. The team will track metrics for email campaigns; for example, whether emails were opened, if recipients clicked on links, where on the website they went, and how long they stayed. Metrics for workshops include tracking whether they reach their minimum attendance goal. PG&E has a standard workshop pre- post survey that assesses whether the attendee learned anything, what else the attendee might want to learn, or whether they want PG&E to follow up. PG&E sends follow-up material through *You Send It*, an electronic mail delivery service. When people go to retrieve documents, the team can track how many people retrieved the information. For example, the team was able to identify how information that was sent to the 82 attendees at a workshop ended up being downloaded by 152 people.

Effectiveness of Integration

The marketing team believes that integrated marketing can help increase energy savings. However, this can only be determined with measuring the outcomes over time. An integrated approach stems from a whole battery of activities. When done right, there will be a plan along with the implementation which could take time and should be tracked. An integrated strategy encourages taking a comprehensive approach and helping customers to see that some measures that might appear prohibitively expensive by themselves make great sense in a larger project with other measures. This is where the marketing team sees the benefits from using customer videos as part of its strategy. Customers can see that through a long-term consulting relationship with PG&E (or an engineering firm on PG&E's behalf) year after year the customer can improve their operations through projects, manage their bills, and get more output with less input.

Recommendations for Increasing Participation through Marketing

The marketing team had a few recommendations for helping to better communicate to the customer about IDSM.

- Make it relevant to the customer. There is a need to use marketing to create a base level of understanding of IDSM and to communicate the benefits to the customer.
- Provide the customer with more in-depth information to give them context (a value proposition) as to why the programs are needed.
- Tie-in benefits of smart meter with IDSM; make sure customers understand the benefits they can tie to the technology.
- Focus on providing self-service tools for small and medium customers who do not have assigned account representatives.

Barriers to Implementing Integrated Marketing

The multiple balancing accounts that supply funding for EE, DR, and DG have been a key challenge for the marketing team when developing integrated marketing campaigns. A main issue had been the cost-effectiveness guidelines for each account for how those dollars are used. Now the team takes a “co-marketing approach” to address integration; in this way, the team is minimizing the potential for duplicating efforts or creating situations where it appears it is asking for the same dollars in two different places.

Funding is becoming less of an issue due to more clear guidance. Some of the recent regulatory decisions, in DR specifically, are making it clear to the utilities they need to adopt a more integrated, portfolio approach to enrollment and DR participation. A key change is that there is more of a holistic conversation about the EE portfolio. Marketing and program managers work collaboratively to figure out on a comprehensive portfolio basis, marketing plans, channels, etc.

Funding can still be a barrier to some of the recommendations regarding the creation of a campaign to build basic education about IDSM. Since base education is not directly tied to a specific program goal, the marketing team needs to convince the programs that customers need to first understand the basics about EE, DR, and DG before talking to them about a program. They have a challenge explaining what level of attention the base campaign will generate on different topics and whether the attention will build enough customer-understanding to make decisions.

IDSM Marketing Budget

EEGA indicates there is a \$3.5 million budget for IDSM marketing. This budget was bridge funding. PG&E’s marketing department also received \$1 million out of DR and some low

income EE funds. The intent for those dollars was to bridge from the program-oriented approach to a more holistic, portfolio-based, integrated result. The Marketing department used some of the budget towards research, analysis to understand which messages were complementary, how customers looked to PG&E for information, and making sure the team was getting the flow of communication in the right order. The Marketing department is now looking at the marketing budgets overall as needing to be more integrated.

2.6.3 Conclusions

A review of PG&E's extensive collateral material (provided via the data response and reviewing the website) indicates that PG&E has taken a comprehensive approach to developing integrated marketing despite concerns expressed about funding barriers. This is very apparent in the factsheets available by customer market segment for the nonresidential customers developed by the Solutions Marketing team. The IDSM Marketing Strategy team has also effectively reached the mass market customer by leveraging the company's broader based marketing campaigns around SmartMeters and seasonal campaigns. This is apparent in the research results on the campaigns regarding customer awareness of actions they can take to save and manage their energy.

It is still unclear, however, whether the way PG&E aligns its marketing function and budgets is the most cost-effective approach to IDSM. The Integrated Solutions team does not have a separate marketing budget; it is fully funded by the nonresidential programs. However, as noted above, the bulk of its marketing materials include IDSM messages. The residential programs still maintain the bulk of their marketing budgets to promote their individual programs/rebates but until this year, they have done very little to promote IDSM. They included some messages this summer and state that they plan to expand more next year depending on the results of this summer's effort. The IDSM Marketing Strategy team does work with the residential team to help it develop its materials; however, the bulk of the approximately \$3.5 million budget goes to conduct IDSM research and to stage IDSM events versus other traditional outreach activities. Until the residential team starts to include more IDSM marketing into its current efforts (as does the nonresidential team) one cannot state that the residential marketing is fully integrated and whether the current model is the most efficient from a costs perspective.

Finally, the marketing team stated that it would like to create a marketing campaign for IDSM that focuses on building a base case for understanding the concept of IDSM. The team stated that the separate funding stream from each type of DSM creates a barrier to creating such a campaign. Yet it appears the marketing team has conducted research to test messages in terms of pre-post studies, and it is concluding a study on how customers perceive PG&E programs together. It is not clear on whether the team has conducted any research to determine the current baseline of understanding of IDSM or identified what are the value propositions it should communicate. The information may be within the data collected so far and may just need some

secondary analysis to bring it forward. In any case, there should be some knowledge base available to support such an effort to encourage the other DSM areas to support the base education campaign.

2.6.4 Recommendations

Following are recommendations for the CPUC IDSM Task Force and PG&E IDSM to consider as they continue to plan and implement IDSM marketing.

- The CPUC IDSM Task Force should commission a study and/or analysis on the cost-effectiveness of using integrated messages in PG&E's residential program marketing compared to PG&E's integrated mass marketing. The evaluation should analyze the marketing's ability to raise awareness of stated intentions toward taking integrated energy options.
- The CPUC IDSM Task Force, in collaboration with PG&E's marketing team, should identify possible sources of funding to conduct a study that focuses on identifying the baseline understanding of IDSM among consumers. The study should also determine what the underlying IDSM value proposition is for customers.

2.7 SmartMeter/Advanced Metering Infrastructure DSM Integration

2.7.1 Web Tools

PG&E is in the process of providing a variety of SmartMeter-enabled information presentment tools. PG&E is designing the tools to provide customers with information that will educate them about how they are using energy and enable customers to better manage their energy costs. The primary web platform that allows for integrating the SmartMeter data with the various IDSM tools, products and services PG&E offers, starts with the "My Energy" web portal. From the web portal, customers can access their hourly usage data, usage comparison data with the previous day, month, year, and energy use compared to similar neighbors and more efficient users (similar to the information provided in the mailed HERs). They can also view available rate options, such as the DR SmartRate (and in the future, time-varying rates) and run costs scenarios by clicking on the different rate options. Customers can also query for relevant conservation and EE recommendations and rebates. Finally, the My Energy portal has a link to the CSI solar calculator so customers can assess the viability of adding solar. PG&E completed the launch of My Energy in November 2011 for residential, small/medium business (SMB) and small agriculture customers. In December 2011, PG&E added the Green Button, a feature for customers to download their usage data into machine readable (XML) format for use by third-party application developers.

PG&E also recently upgraded its web-based tools with the Progressive Energy Audit Tool Suite (PEAT) to support increased self-service and detailed energy management capabilities. Customers can access the Progressive Energy Audit Tool by completing an initial audit on the “My Energy” web portal. The Progressive Energy Audit Tool differs from the more traditional audits in that it provides continuous improvement that prioritizes recommendations available to the customer for the way they use energy. The customer can come back and update the audit data with new input (i.e., the customer does not have to re-enter all of their data) and the tool will recalculate audit information and recommendations based on the update. PG&E will continue to expand the audit functionality to offer additional information on the customer’s specific energy consumption, to further personalize the improvement recommendations, and to provide an integrated summary for the customer of their EE, DR, and DG opportunities.

Over time, PG&E plans to continue to improve the website to incorporate additional features to engage and educate customers about time varying pricing, EE, behavioral change, DR and DG offerings.

2.7.2 Products that Leverage Smart Meter Data

PG&E has either rolled out or is pilot testing several products and tools that leverage SmartMeter data. These include:

- SmartRate™ – a residential critical peak pricing program,
- Energy Alerts – email-, text-, or phone-based notification as residential customers cross rate tiers or are forecasted to cross rate tiers,
- Home Energy Reports (pilot) – paper-based, personalized energy information and neighbor comparisons,
- Home Area Network (pilot) – initial roll-out of up to 5,000 home area network devices linked to SmartMeters and future implementation of DR capabilities for event notification, pricing and direct load,
- Green Button – enhanced, more convenient customer access to energy usage information via My Energy Web, and
- Electric vehicle rate calculator – provides customers with a web-based tool for illustrative calculation and comparison of electric rates and costs for charging their electric vehicles.

Other activity where PG&E has plans to use data from the SmartMeter include:

- Providing third-party access to customer energy usage data through the utility’s backhaul, when authorized by the customer. This functionality was requested in PG&E’s application filed in early March, 2012 as required by CPUC D.11-07-056.

- Collaborating with the CAISO and the other IOUs to develop methodology for making wholesale price information available to customers on the utility website, as required by CPUC D.11-07-056.
- Collaborating with the other IOUs on a study to provide pricing information to customers in real time or near-real time, as required by CPUC D.11-07-056.

2.7.3 SmartMeter Research

PG&E has engaged in ongoing customer research aimed at assessing the effectiveness of various outreach marketing campaigns in educating the customer about the deployment process and benefits they can expect from SmartGrid. PG&E is actively trying to improve the perceptions of SmartMeters and the SmartGrid, and in doing so it is including messaging on integration options such as My Energy as a benefit from SmartMeters.

In June 2011, PG&E filed a report entitled “PG&E SmartGrid Benchmark Survey” (based on 1,000 phone surveys with customers). The survey collected baselines on awareness, understanding, and favorability of the Smart Grid and related benefits. PG&E plans to continue to track these variables to measure the impact of various messaging and customer communications on customer perceptions and knowledge about the Smart Grid Pilot Deployment Project.

PG&E also ran SmartMeter outreach marketing campaigns, “Power a Brighter Future” and “See Your Power” in 2011-12. Each campaign included information on accessing the My Energy website to learn more about how to manage energy. Below are topline results (as compared to the baseline) from the research conducted after the second campaign, “See Your Power”.

- Four-fold increase in SmartRate™ awareness / 75% increase in stated intent to participate in the rate program.
- Eleven-times increase in My Account awareness and two-fold increase in stated intent to use.
- Customer-stated enrollment in SmartRate™ increased by 60% after SYP campaign launched.
- Customers-stated use of My Account doubled after exposure to the SYP campaign.

2.7.4 Potential Program Enhancements with SmartMeter Data

The interviews with the various members of the IDSM team (programs, pilots, marketing, and account representatives) did not reveal an ongoing working relationship of those involved with IDSM and the PG&E team that is engaged with the SmartMeter deployment or SmartMeter-enabled products and service development. The only IDSM team members who appear to be involved with the SmartMeter team were the audit team working on the Progressive Energy

Audit Tool audit products and the Residential team with their retail kiosk explaining SmartMeters and enabled products to customers. According to discussions with the IDSM consultant, members of the SmartMeter team do not participate in the monthly IDSM meetings nor provide input for the IDSM quarterly report.

Most of the IDSM program and account team members do anticipate that their activities will become more integrated with the products and data generated by SmartMeter going forward. They anticipate that more information provided to the customer should help them better sell integrated solutions. Following are future program enhancements anticipated by the various program and account staff involved in IDSM.

SmartAC/Energy Savings Assistance Program

The SmartAC team interview indicated that incorporating or equipping SmartAC participants with home area networks are on the list of possible program enhancements. The team also mentioned that it anticipates leveraging the data from the devices to conduct virtual home visits to look at spikes in energy use and making DR determinations from this data. The team is looking at possibly taking the affiliate-enrolled (contractors) population and see how they perform against the larger Smart AC population to see if they opt out less. According to feedback from PG&E's IDSM team, discussions on these activities have so far been informal.

Integrated Audits

The audit team is currently working with the SmartMeter team to bring in the data from the smart meters into the audits because it is better to give customers information on their specific usage. They have learned from the consultants who conduct the large integrated audits that providing customers with data on their actual usage and comparing them with others in their area or similar to them is a very powerful tool.

DG and Solar Programs

The DG/Solar team believes the energy technologies offered by the DG/Solar program will be enhanced by the smart meter. The interviewee states that for solar customers, when smart meters become available they will be able to provide customers with an interface on their hourly net usage that will help customers see their usage and see how they can reduce their consumption; the same will be true for storage customers. They also foresee being able to build packages using SmartMeter data for customer segments (versus just offering programs) where they can provide a value proposition to integrate DR and DG and give customers the tools to manage their energy and help them reduce their consumption and costs.

Residential Programs

The residential team is working with the SmartMeter deployment team in trying to educate mass market customers on the function of SmartMeters and bring awareness on how the technologies will be useful to manage energy use under time-varying rates. This effort is part of a larger company communications effort to begin to prepare customers for time-varying rates in the coming years. The residential programs are aiding this effort by facilitating the installation of kiosk displays for SmartMeters and home area network devices (HAN) in retail sites such as Sears and Best Buy. The residential team has yet to determine how the SmartMeter-enabled technologies will enhance the residential programs specifically since the home area network efforts are in the pilot stage. The residential team meets quarterly with the HAN team to stay abreast of progress. The program team foresees there will be a number of disaggregation tools where they will be able to integrate with SmartMeter technology and data.

Account Managers AMI Integration

For account reps serving large customers, introducing integration with SmartMeter deployment is not something they are working on yet since these customers have not received SmartMeters (large nonresidential customers will be the last group of the deployment). However, the account reps are playing a role with the deployment by alerting the medium nonresidential customers about the coming change with default time-varying rates (next year). They believe that the SmartMeter data and enabling tools will help these customers understand the TOU rate and improve their energy management (there are A6 and A16 rate-class customers included in the home area network pilot). However, for larger customers already receiving hourly data from Interact, having access to SmartMeter data will not be much different from the current situation.

2.7.5 Conclusions

It is clear that PG&E's IDSM efforts include some integration with ongoing activities to educate customers about the deployment and benefits of SmartMeters, SmartGrid, and testing technologies using the enhanced data. However, there is room for more work in this area. A key challenge for PG&E's IDSM team is that the IDSM and SmartMeter activities are in silos. As stated during interviews, the IDSM team did not see reporting and communicating about the SmartMeter activities (beyond what is happening within the programs themselves) as being part of their IDSM coordinating responsibilities. Nor does it seem that those working with the deployment and education efforts see that that they should be part of the ongoing IDSM collaboration. The groups did not see the need for coordination until the CPUC evaluation team asked that PG&E provide information on SmartMeters activities within the IDSM context. Yet, it is clear that there is a need (as indicated in *Future Enhancements* section above) to either begin planning for and/or keeping close track of the deployment process in anticipation for future enhancements to the current IDSM efforts.

2.7.6 Recommendations

Based on the summary and conclusions of this research the Evaluation Team recommends PG&E's IDSM team and program managers take the following actions/activities to improve integration efforts with the SmartMeter education and deployment efforts.

- Add a member from the SmartMeter education and deployment team to PG&E's internal IDSM Task Force.
- Begin reporting SmartMeter activities that can enhance integration (i.e., status of various technology tests such as home area network deployment, results of surveys indicating awareness of benefits of better data/IDSM options, status reports on website tracking metrics, etc.).
- IDSM team managers prepare schedules on when they anticipate developing action plans for rolling in SmartMeter enhancements (based on timelines on when the necessary data and/or technologies will become available).

2.8 PG&E Program Offerings Available for Integration

2.8.1 Distributive Generation (DG) and Solar Programs

The DG/ California Solar Initiative (CSI) program integrates with PG&E's EE programs by requiring EE audits before one can apply for a CSI rebate; and requires new homes to be 15% more efficient than Title 24. SGIP participants must also complete an audit and implement energy-efficient recommendations with two-year payback.

Program and Integration Goals

PG&E offers solar incentives for installation of solar and solar water heating to residential, nonresidential, and government customers for retrofit and new construction projects. PG&E customers are offered a total of seven renewable programs; five of the seven programs are administered by PG&E. These programs are: 1) California Solar Initiative (CSI), which provides incentives for installation of solar photovoltaic (PV) panels on homes or business; 2) Multifamily Affordable Solar Housing Program (MASH), which offers higher incentives for installing solar on multifamily/apartment affordable housing; 3) New Solar Housing Partnership (NSHP), which offers incentives for the construction of new energy efficient homes that install solar (existing homes are covered by CSI); 4) Single-family Affordable Solar Housing Program (SASH), which is administered by GRID Alternatives and offers higher incentives for installing solar on low-income single family homes; (this program recently closed and the technologies covered are now available in SGIP); 5) CSI Thermal program, which offers incentives for installing solar water heating systems on homes and business, 6) Emerging Renewables Program (ERP), which provides incentives to customers who purchase and install small wind systems and

fuel cells for on-site generation and is administered by the CEC; and finally, 7) Self Generation Incentive Program (SGIP), which provides incentives for the installation of qualifying systems (i.e., PV, storage, CHP, etc.) that are at least 30 kW in size.

According to the interview, the goals of the CSI and solar water heating programs are to help the industry reduce costs and help create a self-sustaining PV and solar hot water market by the time those programs are completed at the end of 2016. For Multifamily, it is to help educate low-income customers on the opportunities for PV and to help them realize the benefits through offsetting their usage through PV. For new solar homes, it is to help develop the solar market for new tract homes and developments to comply with the more stringent Title 24 requirements requiring 50% of new tract homes have solar in the near future. The goals for the SGIP are to help reduce peak load and to ensure that all of the qualifying technologies are actually reducing GHG emissions.

The DG and Solar programs do not have any specific integration goals related to EE; however, the programs do have EE requirements. Customers looking to participate in CSI, low-income solar, and the solar water heating programs are required to complete an EE audit. For the new solar homes partnership, the homes are required to be 15% more efficient than Title 24. Homes that are 30% more efficient than Title 24 will receive a higher incentive. Also for the solar water heating program, all exposed pipes must be insulated, which enhances EE. For SGIP, customers have to complete an EE audit before they apply, and if there is an EE recommendation that shows a two-year or less payback, the customer must complete that EE recommendation before they receive their incentives.

Integration Resources and Support

The DG and Solar program team sees the PG&E.com/solar website (includes the solar calculator) and any educational material they provide the customers as the main resources available to support integration with other IDSM areas. Account representatives use the solar calculator to present the full DSM picture that includes EE and DR so the customer can also consider these opportunities while looking into solar. The team also has the solar customer service center where they respond to customers wanting to know about solar and where they will also let the customer know about EE.

The DG/Solar team stated they follow the management guidance that they should always look for integration when presenting to third parties and customers. They state that solar and other DG technologies are an option but EE should be looked at first. They do not provide specific guidance on which EE programs to consider, but instead they have a high-level conversation about there being EE programs available that the customer should consider. They talk about integration every chance they get and whenever they attend events.

According to the interview, the DG/Solar team obtains feedback from implementers by working and talking to contractors to gain an understanding on the pain points and success points of the program. However, there are not many contractors who can implement an integrated project. The contractors are focused on solar and there are only a few that try to integrate EE and solar.

Internal/External Integration

The programs the DG/Solar programs pair with most often for integration are the low income and residential new construction EE programs. According to the interview, the team will have discussions with the low-income EE group to get a better sense of how they are integrating and helping the low-income customers. The team will also coordinate with the residential new construction EE group to leverage activities such as the plan check process to determine where the development is in meeting the required 15% or 30% above Title 24 standards.

The DG/Solar programs are all statewide, requiring external coordination. According to the interview, the DG/Solar team meets monthly with the other IOU program administrators to create and improve efficiencies within the programs. In addition, the team has collaborated with the City of San Francisco, Berkeley, San Jose, and Sonoma County because they all also have solar incentive programs. They also partnered with other local and state governments.

The DG/Solar team does not have integration meetings with other program managers (other than those mentioned above). However, the team does meet with the IDSM task force to share stories and successes.

Integration Successes and Challenges

The DG/Solar team noted that one of the key successes of the CSI program is that the program tends to promote higher awareness for EE measures among customers who have installed solar. The interviewee cites an Itron M&E study for CSI as the source of this observation. The study reports that customers with solar who participated in CSI take more EE measures in comparison to customers who have not gone solar.³

According to the interview, a key challenge for DG/Solar integration is in trying to find that silver bullet within the solar industry as to why they should promote integration. The team works with many contractors who focus on PV and solar water heating, and other DG technologies; but the setback is in getting them to work together with EE. The industry is also challenged by the loading order for integration where DG/Solar is the last step. Efforts to have the customer complete efficiency before they can apply to the DG/Solar programs results in the industry push back.

³ Itron, "CPUC California Solar Initiative: 2000 Impact Evaluation Final Report," June 2010.

The DG/Solar team could modify or update their program to reduce barriers to integration and coordination with other internal DSM offerings, by improving the integration material to better fit customers and externally, by having the solar contractors meet and partner with EE vendors.

The team was not sure how to break down barriers (within the program, PG&E or regulatory) to better integrate/coordinate with programs that facilitate generation or storage on the customer's side of the meter. In the short term, the team does not know if anything can be done beyond requiring EE action before a customer can apply to one of the DG/Solar programs, even though that may result in push back from the solar industry. The team suggests looking at restructuring the program with bonus incentives for EE/DG combinations.

The large commercial customer is more likely to pursue integrated solutions in an effort to become as energy-efficient as possible. Integrated solutions are tougher for small/medium business since many do not own their own buildings. The team finds residential customers are the least likely to pursue integrated solutions.

IDSM Knowledge Enhancement

The DG/Solar team has a member that participates in PG&E's internal IDSM task force and attends the monthly meetings. The team also participates as trainers for DG/Solar in the yearly IDSM training as well as attends other training sessions on IDSM.

From the team's perspective, there are no complementary energy-efficient technologies or programs to solar where they would need a thorough base of knowledge; nor is there a specific EE measure that could make solar or storage better. The team focuses on understanding EE measure that would make sense for the customer, measures with a better payback than a PV system. Customers should implement these measures to reduce the required solar system size. The DG/Solar team does not have any specific goals for integration. The team does, however, include integration in conversations with third parties and customers and has made it a priority in terms of making sure customers understand their options.

Tracking and Evaluation of Integration

According to the interview, PG&E does not track EE, DR, DG, and AMI-enabled program integration at the project level. The CPUC did not set specific goals for the DG/Solar programs; its goals and tracking are purely about the technologies it provides incentives for, along with the requirement that it educate customers about EE measures.

Marketing

The DG/Solar team believes that marketing integration is a challenge. The marketing for the DG/Solar program is not designed to increase the number of customers implementing IDSM.

The DG/Solar team believes that “Saving money and ways to do that” stands out most in terms of features that resonates with customers. The team also stated that it primarily engages customers about integration using outreach strategies such as, face-to-face inquiries, meetings, conferences and customer events. The team had no opinion on which of these strategies were the most effective in encouraging customers to adopt integration.

AMI Integration with the DG Programs

According to the interview, the DG/Solar program is currently not integrated with the smart meter/AMI deployment. The team believes, however, that the energy technologies offered by the DG/Solar program will be enhanced by the smart meter. The team anticipates that when smart meters become available, it will be able to provide customers with an interface on their hourly net usage that will help customers learn how they can reduce their consumption. Smart meters are becoming available for CSI customers and it has a few pilots in progress that are providing data to customers.

In response to how the DG/Solar program can improve integration with the deployment of smart meter technology web offerings in the short, medium, and long term, the team responded that in the short term it can continue to help customers realize what will become available to them. In the long term, the team believes it will be focusing on putting together packages for customer segments rather than the programs themselves. For example, the team foresees looking at a winery customer and building a package for them where it can provide a value proposition to integrate DR and DG and give customers the tools to manage their energy, and help them reduce their consumption and costs.

Incentives

The DG/Solar team does not believe the current incentive structure adequately motivates customers to integrate across all IDSM areas and AMI-enabled technologies. The team does not necessarily believe additional incentives are the answer, but believes an approach where integration is looked at by customer segments rather than by customer is more appropriate. The team believes not every energy-efficient measure is worth it for DG/Solar customers and that given the cost of PV, some EE measures may no longer be cost-competitive to solar. The team states that audits (integrated) do not optimize and DG/Solar customers do not get energy alerts. The team believes in looking at the customer sector, understanding each sector, and finding which EE and/or DR measures make sense for DG/Solar customers.

Application Process Integration

According to the interview, the application process for DG/Solar is integrated.

2.8.2 Residential IDSM

Program and Integration Goals

PG&E, along with the other CA IOUs, offer a number of residential retrofit subprograms where they can promote opportunities for customers to consider integrating services/programs from other IDSM areas. The key residential retrofit programs include; Home Energy Efficiency Surveys, Appliance Recycling, Home Energy Efficiency Rebates, and Multifamily Energy Efficiency Rebates. Within these programs, the IOUs focus on a variety of measures including, lighting, HVAC-whole house, and appliances. They also recently expanded program offerings to include consumer electronics, workforce education and training, low income programs and demand side management integration.

According to the interview, there are no explicit regulatory goals or program performance metrics for the residential programs regarding integration. As an example, while the Whole House program may have goals associated with looking for, identifying and executing one or more integration opportunities, the program team does not have metrics on how many integrated units to sign up; nor does the CSI team have specific CPUC unit goals associated with integrating with the whole house program. However, PG&E does assign where appropriate, goals to program managers to make sure they pursue such opportunities.

Integration Resources and Support

The specific resources PG&E makes available to help the residential team integrate their programs with other IDSM programs are mainly internal meetings and marketing materials that support integration. According to the interview, the manager of the residential team attends a monthly managers meeting for those managers involved in assessing integration possibilities. PG&E's IDSM consultant runs these meetings. The purpose of the meetings are for PG&E managers to be aware of what is going on in the integration space, and to leverage best practices or projects being launched. The residential team also receives direct support from the consultants. The consultant, along with other team members, work together to help identified integration opportunities; the consultant will then facilitate conversations on how to best integrate these opportunities with other IDSM areas such as solar. There is also resource sharing of marketing materials. For example, the low income energy savings assistance program will include messages for several different programs including DR and the CARE rate, in their marketing.

The team reported that while they do solicit feedback from third parties, they do not solicit feedback specifically on integration. With regards to contractors, the team has met with contractors on several occasions to discuss how certain opportunities are working such as Whole House and solar, HVAC, and quality maintenance. In these discussions the team looks for evidence on how the affiliate program is working.

A key component for identifying resources or removing barriers that would help the residential programs better integrate across all DSM areas is maintaining regular communications and providing guidance that integration is a priority. The key is making sure there are regular manager meetings and making sure all employees are aware of the importance of providing an integrated customer energy solution as opposed to a specific EE or DR or other program options. The team sees the regional meetings with the energy solutions team as a key piece in reinforcing the “look for integration solutions”.

Internal/External Integration

The residential team believes the Home Energy Efficiency Surveys (HEES) and the My Energy Online tools provide the best opportunities for integrating programs internally. According to the interview, the Home Energy Efficiency Survey and the My Energy tool are a great way to make sure information about integration opportunities are kept current. The team also sees connecting the progressive energy audit tool with solar or other opportunities as a great platform for integration.

When it comes to program managers sharing integration lessons internally with other program managers, the team states that there are enough opportunities to talk with solar and DR counterparts (beyond the monthly IDSM manager’s meeting). The team also stated that members of the residential team (who are not included in the monthly IDSM manager’s meeting) also meet with the solar or DR folks regularly. According to the interview, the team meets frequently enough with other PMs and does not see that there would be value in regularly scheduled meetings because integration is a core part of what they are doing.

The team sees its participation in the internal IDSM monthly meets as an opportunity to report out on what the team is doing and to hear about what others are doing in the IDSM space. The participants in these meetings make up PG&E’s internal IDSM Task Force. The meetings are where they disseminate regulatory guidance from ED, prepare the quarterly reports, and oversee the IDSM process.

The team also works with external parties to promote integration and mentioned its work with Sacramento Municipal Utility Department (SMUD) as an example. The team has worked with SMUD on the Whole House program; SMUD pays the electric portion and PG&E pay the gas portion. The program was initially American Recovery and Reinvestment Act (ARRA)-funded and continues post-ARRA funding. From PG&E’s perspective, it needs to make such offerings where one utility serves electric and the other serves gas as seamless and aligned as possible.

Integration Successes and Challenges

When it comes to success in residential program integration, the team attributes success to the good working relationship it has with retailers. The residential team meets quarterly, or anytime

there is an opportunity, with the account team to share its experiences either with the retail channel or with the customer. The team believes it has been able to unlock opportunities for each other based on that close working relationship.

In regards to challenges, the team is facing a challenge with the loss of the Smart AC program for small and medium businesses. At the present, the team does not see any solutions to replace this DR solution for small and medium business. According to the interview, there is concern that there seems to be an expectation from the regulators that everything will be integrated all the time; “there are definitely good opportunities, things we should be taking advantage of and for the most part are. In addition, there are other situations where just because we want a customer or contractor to do something integrated, the customer may not want or need it at the time. The contractor’s business model may not align with it. We need to be sensitive to the fact these programs are operating in a space where an integrated solution may not be the right solution all the time.” The team believes that it is important to have a dialog with regulators on where integration makes sense and where it does not in order to manage expectations.

Suggestions provided during the interview on actions to consider in the short-medium term and longer term to help reduce barriers to integration include:

- In the short term, anything that can be done to simplify and streamline the programs is good for the program. It also makes it easier for the program to connect with another IDSM area or program.
- In the longer term, dealing with the challenge of different regulatory buckets for EE, DR, and DG funding and different program cycles. The team recognizes that trying to align filings for all IDSM areas at once can get unwieldy. It suggests pushing the cycles out a year or two where they overlap some but also provide enough time to put the individual filings together. According to the interview, the team sees good opportunities for integrated marketing and having a combined budget could help make it happen.

When it comes to integration with programs that facilitate generation or storage on the customer’s side of the meter, there appears to be room for improvement. According to the interview, one thing that would make things easier is having continuity and agreement on policies among the various regulatory filings for EE, DG and storage. For example, on the CSI solar thermal side, propane customers are allowed to participate, whereas fuel switching is a problem on the EE side. Having clarity in how to address such inconsistencies and acknowledging they exist will help reduce barriers for the residential team to better integrate with such programs.

Customer segments that are most likely to pursue integrated solutions depend on the customer’s financial status. Single family homeowners are more likely to undertake investment-grade

opportunities like solar or whole house retrofits. Low-income customers are less likely to undertake such actions. Either customer can participate in Smart AC and receive an incentive without having to make an investment. According to the interview, for most customer segments there is at least one integration opportunity. However, finding integration actions that small/medium business customers will consider is challenging without access to Smart AC.

IDSM Knowledge Enhancement

The team was not given any specific metrics or objectives to incorporate IDSM into the residential EE programs. According to the interview, PG&E's senior management set the vision of how the team is to deliver IDSM to its customers.

The residential team was advised to look for opportunities to deliver a customer energy solution that is meaningful for the customer. Such solutions do not necessarily mean a specific program or rebate, but mean understanding the customer's need and providing a solution that meets that need. For some customers, addressing their needs can incorporate only EE or using the progressive energy tool online. In other cases the need might include a comprehensive EE, DR, and solar solution. The team's guidance is to look for opportunities holistically, and plan and deliver programs that are meaningful for customers, not just within strictly defined regulatory budgets or program definitions.

Members of the residential team attended the annual IDSM training. According to the interview, the training has reinforced what the team talks about every day and what it talked about at the monthly IDSM task force meetings.

Tracking and Evaluation of Integration

The residential team has access to program participation tracking for its programs down to the site or customer account level. They can also query whether the customer has participated in more than one EE program or whether the customer is a Smart Rate customer. However, the team does not have access to electronic integration tracking for its program and other IDSM areas such as CSI. The team believes that there is some capability to obtain integration tracking at the customer level from multiple databases. The only internal reporting on IDSM, to the team's knowledge, is quarterly and comes from the IDSM Task Force.

Marketing

In the data response, PG&E described its residential retrofit integrated marketing and outreach plan as rooted in:

- Insight and analysis of customer behavior from the customer database,
- History and analysis of customer engagement in residential programs,

- Lessons learned and best practices from Smart Meter outreach, and
- Early work integrating multiple programs and messages through Power a Brighter Future campaign, retail partnerships and other efforts.

PG&E has done an extensive amount of work in creating an aggregate customer intelligence data system where it has analyzed customer participation history along with census data and economic factors that may influence their participation propensity. PG&E uses this information to develop insights on how to develop message themes and target customer segments. PG&E's integrated residential marketing consists of multi-channel delivery of three different campaign themes, each building on the other. The goal of the campaign themes were to educate the customer on the benefits of the smart meter and raise awareness of the integrated services and programs they could access to help them manage their energy use. The integrated residential marketing campaign themes were: *See Your Power (to raise awareness of smart rate and My Energy)*; *Power a Brighter Future (raise awareness of smart meters, time varying pricing, DR events)*; *Breathe Easy Solutions (raise awareness of Energy Savings Assistance Program, CARE)*. The multi-channel delivery for these campaigns included retailers such as Sears, Best Buy (both had kiosk displays), online, direct mail, mobile tour, and TV. PG&E also ran integrated messages for residential customers in its regular fall, winter and summer seasonal campaigns. The integrated themes included in all of the campaigns addressed ways for customers to save energy with EE rebates; instructed them on how to understand and manage their energy with My Energy; provided information on the benefits from DR through Smart Rate, Smart AC; and provided information on the environment benefits of CSI.

When asked how well does the integrated residential marketing materials serve the needs of the residential customers, the residential team rated the integrated marketing material a 4.5 on a 5 point scale where 5 is the best. The team sees having message consistency through the materials as good and that pointing customers toward *My Energy* and the online tool help the customer identify opportunities for saving energy across multiple IDSM options. In contrast, the primary purpose of the *energy efficiency* marketing materials is to drive participation to EE programs where there are more EE solutions. The residential program team is planning an integrated marketing campaign for residential customers this summer, and depending on the outcome it will probably do more integrated marketing.

From the team's perspective, what resonates most with customers when it comes to marketing integration is not the label "integration" but the perception from the customer that there is someone who understands their needs and are being responsive by having programs that meet those needs.

The residential team uses multiple outreach strategies to engage customers about integration. The team relies on the smarter energy line, a specialty call center that is trained to answers

customer inquiries about residential solar, low-income and EE. The team uses targeted mailings or email where it includes at least one integrated message and encourages customer to visit the Smarter Energy line (the number is included on applications) or the My Energy portal on pge.com. Customers using the My Energy portal can log into their account and look at their smart meter data and related tips. Most of the integrated marketing is aimed at driving customers to either Smarter Energy Line or My Energy.

The residential team believes the My Energy web portal is probably the most effective marketing strategy. According to the interview, this vehicle is about meeting the customer on their terms and getting them involved with the web portal to take the progressive energy audit. Other methods the team uses to meet customers on their terms are making sure retail partners have information about the programs and services PG&E offers at point-of-purchase. The team also uses the in-store opportunity (if it is in a home energy department) to talk about smart rate, or AMI, EE rebates, and appliance recycling. A specific example of integrated marketing by the residential team was a direct email campaign, where the campaign included messaging on smart rate, the upcoming end of the dishwasher rebate and information about My Energy.

AMI Integration with the Program

The residential team has already begun to integrate with the Smart Meter/AMI deployment in limited efforts. The team described an engagement where the residential team brought in the EE retail channel partner, Best Buy in San Carlos, to set up a kiosk that provides hands-on learning regarding the smart meter. The kiosk helps customers understand what smart meter is and how it connects to some of the devices in the home.

According to the interview, it is too soon to tell how the technologies in the residential program will be enhanced by Smart Meter/AMI since all the home area network efforts are in their pilot stages. At this time, the team does not have any AMI-enabling technology to promote, but the team meets quarterly with the home area network team to stay abreast of what is going on and what type of program it may need to support.

The residential team believes there are a number of disaggregation tools that the program could use to help it better integrate with Smart Meter technology and data. The team is already doing some disaggregation for customers when it conducts in-home surveys. The surveyor goes into the home armed with some information on what to look at as well as getting the customer to sign into My Energy. The surveyor demonstrates to the customer how they can do some of their own forensics to find out when their energy use is highest and understand how to control it. This activity is currently in the pilot stage. However, the team sees that the future of more information resulting in customer action is linked to having better information and better resources to respond.

Incentives

According to the interview, the residential team believes that the current incentives adequately motivate customers to integrate across all IDSM areas including AMI-enabling technologies. The team sees integration as more about telling a story than providing additional incentives for integrating. The team also noted that no one on the team receives financial incentives for integration.

Hard to Reach Customers

The residential team has performance metrics associated with the hard-to-reach customers. As such, the team will coordinate with the Energy Savings Assistance Program team to help reach the targets.

2.8.3 Conclusions

From the interviews and review of the data provided there is strong evidence that PG&E is proactively promoting a culture of integrated DSM. All of the employees are aware they should actively look for opportunities to include some element of DSM integration in their programs as feasible despite the barriers of having separate regulatory and funding silos. Program teams are finding ways to reach out to the other areas and pick up integration opportunities that have minimal barriers. The teams have been especially active in integrating marketing materials.

However, it is also clear that more can be done by PG&E, and with collaboration with the CPUC, to encourage more aggressive moves toward integration. For example, PG&E can further enhance the current customer intelligence database to include all elements of IDSM for tracking integration at the customer and site level; that is, they can add solar and SmartAC to the current structure. PG&E program teams can then mine this data to provide insights for integration opportunities similar to how they mine the data for EE propensity factors. The CPUC can examine its IDSM Task Force to determine if it has adequate representation from all IDSM areas (EE, DR, DG, and AMI). The CPUC can re-examine the rationale for discontinuing the SmartAC program for small/medium business customers since utilities are struggling to find a comparable integrated replacement for this customer segment.

2.8.4 Recommendations

As stated above, there are more actions PG&E and the CPUC can take to help improve integration within existing programs. Following are specific recommendations to consider.

- PG&E should enhance the current customer intelligence database to include DG/Solar participants. This can help the DG/Solar and EE teams come up with desired program bundles based on what are the most popular EE actions solar customers take. This could also facilitate the DG/Solar team's desire to offer a bundled incentive option for solar

customers and possibly reduce the “push back” from solar contractors who are resistant to telling customers about EE.

- PG&E and the CPUC IDSM Task Force should investigate what DR alternatives they can consider that would replace the lost opportunity for DR via SmartAC for small/medium business customers. It is possible that the CPUC has already provided the rationale for why it instructed the IOUs to discontinue offering this program to the small/medium business customers. If that is the case, then PG&E should make sure it communicates this rationale to the affected program managers.
- PG&E and the CPUC IDSM Task Force (that includes a CPUC representative from all IDSM program areas) should work together to first identify all of the regulatory policies from each proceeding that may produce a conflict if projects are integrated (i.e., policies regarding fuel switching, budget allocations for marketing, scheduling, etc.). Once identified, then the two teams should develop a plan that identifies what areas that the IOUs can address in program changes that will not require regulatory action and which changes that should provide background for a scoping document in upcoming proceedings.

2.9 Reporting and Tracking

2.9.1 Reporting

It did not appear from the data response documents or the interviews that regular reports generated from program tracking data bases on integrated accomplishments are generated/disseminated to the IDSM, Program, Pilot or Account Representative Teams. PG&E does generate the quarterly reports provided to the IDSM task force.

Integrated tracking efforts that are included in the quarterly report are circulated to all contributors, relevant managers and directors and the information is regularly updated on a designated SharePoint site that includes IDSM reports, tracking, presentations and meeting notes. Integrated successes, activities and the Statewide Quarterly Reports are presented at the monthly IDSM Managers meeting held on the third Tuesday of every month. Third, integrated accomplishments are presented at the IDSM Training Sessions that are held annually to provide a forum for educating on and sharing IDSM approaches. Finally, integrated accomplishments are presented to management at the Director and Vice President level at a Quarterly Program Update meeting.

2.9.2 Information Tools

PG&E’s data response also provided information on the various tools and data sources available to most staff, especially the customer-facing functions, giving them access to customer data and to facilitate analysis on characteristics of the customers in specific communities.

The Segment Campaign Automated Reporting Tool provides Account Representatives and Customer Relationship Managers (CRMs), staff who respond to customer queries via phone, with aggregate and individual customer data and has the ability to produce customer targeting lists. *The Business Opportunity Look-Up Tool* provides analytics on customer energy use and participation in the EE DR, and Winter Gas Savings programs. Future iterations of the tool plan to include solar participation data. PG&E also maintains a customer database that combines and manages customer data from multiple internal PG&E and external sources. It provides a holistic view of PG&E customers and assists in creating more efficient and effective outreach and education to customers. According to the data provided, PG&E's IDSM team and others find these databases effective for observing the integrated participation between the EE and DR programs. The program managers commented that they are able to query the various tools and sources to determine whether the customers had participated in more than one EE program or whether the customer is a SmartRate customer or participating in Smart AC.

2.9.3 Tracking

The interviews indicated that PMs and Account Representatives are not aware of any efforts to integrate tracking IDSM accomplishments in one central database (such as Marketing Decision Support System). The account representatives indicated that they track their own IDSM accomplishments separately and report them into the SharePoint site mentioned earlier. From the interviews, we learned that there are at least three distinct tracking efforts primarily using Excel for IDSM efforts; these are: Zero Net Energy, SmartAC, and Account Representatives reporting of Integrated Projects.

The ZNE Pilot is tracking the activity for the nine case studies that are its pilot goals. Other metrics the ZNE team ultimately intends to track are the kBtu/sf performance achieved with the reduced combination of x lighting, y HVAC, and z plug load. As stated, these tracking data will be separate from Marketing Decision Support System but is not completed yet. The team is also tracking the completion of deliverables in sixteen different areas for the pilot.

The SmartAC program maintains an install database comprised of a simple Excel spreadsheet that tracks the affiliate code attached to each installation. It is through this that the program team discovered it was not seeing installation through outreach through the non-profits and decided to throw its efforts behind the HVAC professionals. The SmartAC team, in working with its laptop software developer, who works with a database that shows only households with central AC, has been able to leverage data for all customers who have gone through EE related to their central AC in order to streamline their marketing and only target households with central AC. This creates a better overall customer experience for Smart AC by targeting only those who could use the influence of the program. Additionally, with the incorporation of SmartMeter data, the SmartAC team will be able to track more closely which households, even if they have not gone through an EE AC program, show spikes that indicate AC.

Account Representatives find it difficult to track the EE/DR/DG options they suggest to customers in addition to those projects that are actually adopted. Individual account representatives use the Customer Management Tool (CMT) to input and track sales leads. Account managers are also able to track the implementation success of audit recommendations. However, they do not have access to each piece of the puzzle, and often have to track down other managers to get it. Only one manager specifically reported sitting down at the end of every year with the other program managers to aggregate data for their customers.

Program managers do not have access to integration tracking outside their program and for other IDSM areas such as CSI. Some program managers interviewed felt limited by what data was available to them outside of EE and DR. They do learn about program participation in IDSM efforts or initiatives through the IDSM task force reports at the aggregate program-level. However, this information is based on individual task team member reporting as opposed to an extract from an IDSM database. While each program manager could track program participation down to the site or customer account level, they did not have access to participation in other programs by their customers. The program managers in their interviews insisted that it was possible to extrapolate a picture of integrated program participation, but it was not something done regularly. Indeed, it is even unclear whether the accounts and meters may be matched up at all.

The evaluation team does not have access to the data collection forms and spreadsheets used by program managers, and requests for documentation have not been responded to yet.

2.9.4 Conclusions

One of the key goals of the CPUC IDSM Task Force is to assess the effectiveness in terms of energy savings and costs for implementing IDSM. To do so, the task force will need to have access to project accomplishments and estimated project savings and implementation costs across all integrated elements (EE, DR, DG and AMI) across projects and programs. PG&E at this time only tracks EE and DR (SmartRate) across programs and projects within the Marketing Decision Support System tracking system. Other DSM efforts, (DG, ZNE, SmartAC,) and integrated projects are tracked in separate spreadsheets by the various program leads. Not having access to detailed program information across all IDSM impedes taking a comprehensive view of integration effectiveness for both the CPUC and PG&E. It is not possible to tell quantitatively, whether EE is providing a platform for entering into DG and/or DR or vice versa. While from a technical perspective there may be substantial delays to moving to a more comprehensive IDSM tracking system, there are still methods PG&E can deploy now to help improve gaining access to comprehensive and consistent metrics for IDSM beyond the high-level project reporting included in the quarterly reports.

Unlike the account representatives who do track their integration projects (but do not always track recommendations), there is a notable lack of interest by some program staff to follow the customer adoption of integration across IDSM areas beyond their program area. While the majority of the program interviewees believe it is possible to extract detailed metrics to create better reports on IDSM accomplishments across all areas, none saw the need to request such reports.

PG&E appears to provide its customer-facing and program staff with access to sophisticated data sources and tools that help them better understand their customers based on usage and participation patterns aligned with demographic data. These tools and data sources aide in helping the staff to optimize program and marketing outreach plans by targeting customers with high propensity to respond/participate in integrated offerings. However, the tools and data sources only address past participation for EE and DR at this time. Having data that can provide diagnostics and propensity scores for DG participation would be a crucial next step.

2.9.5 Recommendations

To address some of the concerns mentioned above and to improve overall tracking and reporting, we provide the following recommendations.

- The CPUC IDSM Task Force and PG&E should collaborate on identifying key metrics that are needed to determine energy savings and costs for the respective IDSM area. They should begin by looking closely at what reporting metrics each area is currently collecting (i.e., site information, customer information, measures installed, installation dates, measures replaced, baseline practices, measure/installation costs, expected energy savings, EUL, etc.). Once all metrics currently collected are identified, staff/evaluators can work with PG&E to determine gaps and approach for collecting any missing key variables.
- Using the results from the above recommendations, PG&E should provide detailed plans on how it will produce integrated tracking reports on all IDSM projects that include comprehensive metrics on energy savings, costs, etc. at the project and program level across all IDSM areas. This report will need to expand beyond the project tracking from the account representatives to include both residential and nonresidential customers and expected savings.
- PG&E should begin disseminating regular reports internally from the tracking system (and other sources) to raise awareness of what projects are in play for integration. That is, reports should indicate whether the customer is looking into adding any other areas of DSM to the existing project (i.e., for solar customers, should indicate what EE elements came up during the audit and when to expect installation of EE improvements).

3

Southern California Edison

3.1 Knowledge Enhancement/Training

The 17 individuals interviewed at SCE for this report all showed a good working knowledge of IDSM, although the emphasis in most cases was on the integration of EE and DR. The research team also explored the degree and frequency of inter-departmental integration, which varied considerably.

3.1.1 Definitions of IDSM from Interviewees

When asked to define IDSM, the word “holistic” was used frequently. “It’s a holistic way to approach the customers, with all the services in a one-stop shop.” “Customers want holistic solutions, IDSM brings all the ways we can help them, together.” Another interviewee stressed, “To me it’s just a term, it’s just a nice way of putting EE and DR in one holistic overview for the customer.” Several Account Reps mentioned in their definitions that “one size does not fit all, I think every customer can do EE, but not every customer can do DR, because they don’t have enough load to make it worth their while.” Another defined IDSM as, “It’s the combining of EE and DR, into an integrated offer.”

Most of the interviewees mentioned DG at some point in their description of IDSM, but somewhat dismissively. “I tell my customers, if someone comes in with a proposal, look at it, if you want us to review it, and it makes sense, we’ll help you get incentives to put this stuff in. But most of them don’t make sense. It’s mostly EE and DR, and the DR is either Demand Bidding or Auto DR. So the DR is really pretty limited, and the DG doesn’t make sense to most of my customers.”

Another aspect of integration was brought forward in D. 08-11-031, where the CPUC defined the word “integration” in the context of the Energy Savings Assistance Program as follows:

“Integration constitutes an organization’s *internal* efforts among its various departments and programs to identify, develop, and enact cooperative relationships that increase the effectiveness of customer demand side management programs and resources. Integration should result in more economic efficiency and energy savings than would have occurred in the absence of integration efforts.”

This more operational and cross-programmatic meaning of “integration” was also explored in the interviews, with the question “Do you work with your program managers to discuss potential integration opportunities?” The answers were generally “no”, not with the specific focus on integration. “Not unless it’s warranted, if I have a question or problem, like with the Auto DR, or something unusual.” Integration might be discussed at meetings of Account Reps, if one of them had an integrated project underway, but meetings were not regularly held to discuss integration strategies, sales techniques and support.

3.1.2 Workshops and Training

SCE provided the IDSM Research Team with an Agenda and presentation material from a half-day IDSM workshop for the Business Customer Division (BCD) that was conducted on November 17, 2011. Two hundred and seventeen SCE personnel were invited to attend the meeting; 183 were present, 34 were absent. A consultant presented an overview of the CPUC’s directives on IDSM, followed by a discussion of an integrated sales approach from two SCE employees. Six success stories were presented by account executives. Integrated audits were the subject of another presentation. An “IDSM Leadership Panel” concluded the day, with panelists speaking about EE, DR, DG, Engineering and Self-Generation Support and Marketing. At the end of the workshop, a survey was distributed, intended to serve as a discussion document. Each of these segments is briefly described below.

Integration Overview¹

The first 15 of 128 slides that were presented gave an overview of the CPUC’s directives for IDSM, starting with definitions. What is IDSM? The slide included four different aspects of integration: 1) IDSM organizational structure; 2) Integrated Applications; 3) IDSM Marketing; and 4) IDSM delivery to customers. The next slide gives the regulatory definition of IDSM as: “Integrating EE, DR and DG/Solar (also Low Income Programs and Marketing via Advanced Metering”. The challenges of the different “silos” for funding and program administration at the CPUC and the IOUs were noted, along with customers being “inundated with information from different delivery channels”, via multiple points of contact with the customers: Core EE Programs, Third Party EE Vendors; DR Programs, Third Party DR Vendors, Solar Vendors, Local Government Programs. The case for a consolidated approach was made.

¹ Barakat Consulting, Elizabeth Lowe, Presentation, November 17, 2011.

The next set of slides involves regulatory requirements for IDSM and metrics. The metrics given were:

- Integrated audits
 - “SCE needs to make sure all customers are being offered integrated audits and that the audits meet the requirements set out by the CPUC.”
 - “SCE needs to be tracking audits and program participation as a result of integrated audits.”
- Integrated efforts and organization – “SCE needs to have internal integrated meetings and track efforts for Quarterly reporting and post-portfolio measurement.”
- Integrated Awareness
 - “Awareness and knowledge among relevant IOU program staff regarding how IDSM impacts their efforts and programs.”
 - “Today’s training and the survey at the end are critical to meeting this metric around IDSM Awareness.”

The Overview ends by noting the benefits of integration: better regulatory coordination, leveraging of marketing campaigns, alignment of programs with customer needs, improved efficiencies and potential for reduced costs of marketing and delivery.

Integrated Sales Strategy and Customer Approach

The next section, “Integrated Sales Strategy and Customer Approach” was presented by Business Customer Division Management. The presenters began by explaining that integration is good for the company, improving efficiencies, collaboration, communications, and reducing duplication. They noted that integration is not a new concept. Business Customer Division reps often pull from a variety of programs to present to customers, and that the reps are valuable resources for Marketing and Program Managers to learn from because of their knowledge of customers and their needs, and how to bundle integrated offerings. The next several slides drill down into why and how efficiencies will be improved and duplication reduced, thereby improving customer satisfaction.

Success Stories

This section of the presentation highlights six integrated projects. Each gives a brief overview of the project, including the customers’ names, the kWh saved and kW reduced, the amount of the rebates given, the Programs that the projects drew from, and whether there was DG involved. Successes and challenges affecting each project were noted.

Challenges for each project included:

- Success Story 1: Phase One and Phase Two Applications (for one multi-year project) that each consisted of 500 pages, plus a 24 page Technical Assistance & Technical Incentive Application.
- Success Story 2: “Application process is too slow.”
- Success Story 3: “Application process is a challenge...”
- Success Story 4: “Process too slow and requires continuous follow-up with both Programs and customer.”
- Success Story 5: “Customer limits use of Customized Solutions because of very long lead times from start to finish.”²
- Success Story 6: High cost to install automation for participation in Technical Assistance & Technical Incentives program, and issues regarding Direct Access account and contractual coordination.

Integrated Audits – What’s New

The next 23 slides gave training in the integrated audit templates and note changes in the forms that give more emphasis to DR and self-generation. How and who performs the audits is presented.

Integrated Audits with Third Parties

The Business Portfolio has 20 projects implemented through Third Parties, mostly focused on EE. Business Portfolio has expanded some of these projects to include integrated audits for both customer and contractors. One slide had a breakdown of six sector programs’ budget and goals for EE and DR: 1) Data Centers; 2) Retail; 3) Office; 4) Chemical; 5) Beverage & Manufacturing; and 6) Monitoring Based Persistence Commissioning (Commercial).

IDSM Leadership Panel

Five individuals each presented different views of IDSM. The first was focused on EE, defining it, identifying market barriers, ways to overcome market barriers, and what a customer-centric model looks like. This presentation concluded with a slide noting examples of how EE can be integrated with DR and DG.

The second presentation focused on DR. It began with a listing of four types of Dimming Ballasts and notes that while the Leadership in Energy and Environmental Design (LEED) certification gives only one point for manual DR capabilities, two are given if DR is automated. A hotel project is presented, the first hotel in CA to use Auto DR in its building design. A final slide notes “continued policy support for DR at state and national level” along with “rate

² This customer brought in a third party to handle and expedite the audit, contracting and post-installation inspections, to overcome this issue.

challenge impacts to DR” and that there may be impacts to Business Customer Division with the then-forthcoming CPUC decision on bridge funding for the 2013-14 period.

Solar and self-generation solutions were discussed by the third panelist. The California Solar Initiative (CSI) and the Self-Generation Incentive Program (SGIP) are discussed. Updates and volume growth are given. A slide presents the integration of different SCE Programs with the DG/CSI Programs. Another slide notes the benefits of closer integration, including:

- Faster application processing,
- More cost-effective program administration,
- More cost-effective use of ratepayer money,
- More appropriate program participation,
- Better customer awareness of options, and
- Higher customer satisfaction levels.

The closing slide notes challenges to integration, including CPUC budget issues, changing CSI and SGIP requirements, new generation and energy storage technologies, and evolving customer expectations. It recommends that these challenges be overcome by working closely with CPUC Energy Division, Program Administrators, and other SCE organizations.

The next panelist discussed Project Management Technical Services. This group provides technical support to Business Customer Division “to mitigate risk of loss of load due to self generation and municipalization”. They review customer generation projects at the customer’s request if a Letter of Intent is not yet signed.

The last panelist to speak was from Customer Relationship Management who gave an overview of integrated marketing. Based on research, business customers are segmented into 12 different groups and action plans are created for each segment. The objective is for each segment to receive three integrated messages per year presenting energy solutions via multi-channels. Customers are segmented on demographics, psychographics, purchase behaviors, geographical region, size of business, and NAICS codes, with a goal of matching needs and wants with products, services and rates. The speaker describes the benefits of this approach as follows:

- Integrated approach to SCE’s programs/services/rates,
- Extends marketing dollars allowing for 3+ touch points in multi-media channels,
- Complements program marketing efforts,
- Incorporates events, trade organizations, trade publications and periodicals,
- Allows customized message that resonates with segment,

- Positions SCE as leader in energy solutions,
- Maintain/Increases customer satisfaction ratings, and
- Produces measureable RESULTS (participation and kWh).

A “Needs Assessment Survey was distributed at the end of the session, with topics covered in the training session. Although the survey is titled “Questions for IDSM Needs Discussion” and instructs, “This sheet will not be collected at the end of the discussion. Please jot down your initial responses,” the slide presentation says that the surveys were distributed and collected.

The training session concluded with closing remarks from Business Customer Division Management.

3.1.3 Summary

Comparing and contrasting the interviewees’ opinions and beliefs about IDSM with the content of the training they received, a few themes emerge. First, there is a somewhat awkward fit between the utility-run programs in EE and DR and the DG programs that are, of necessity and by law, run by third parties. This is reflected in both the dubious comments about self-generation and solar made by a few of the account executives, quoted at the outset of this section, as well as by the presentation by the IDSM Leadership Panelist from Project Management Technical Services, whose function is to “mitigate the risk of loss of load” due to self-generation – the very thing that the IDSM approach strives to promote. They act, in effect and upon the CPUC’s direction, as referrals to their company’s competitors – no surprise that there is not a stronger emphasis on DG. Given that regulated utilities are no longer the sole generators of electricity in their service territories in California; this may be an irresolvable tension that reflects the state of the market, as well as its evolution.

Second, it is revealing to note what is missing in the DR offerings, which emerged from the account executives’ interviews and will be further discussed in that section, below. There are very few DR programs, in general, and they are all aimed at the larger, >200 kW customer. While this is an artifact of the pre-AMI era, the world has changed. The small and medium sized customer is an important sector of the market, and once the SCE SmartConnect™ system is rolled out, it will be exciting to see what SCE offers by way of designing and implementing new integrated DR programs and technologies aimed at these customers.

3.1.4 Conclusions

- General knowledge of IDSM was good, but attitude that “there’s nothing new here,” particularly among the more experienced reps, could be refreshed, possibly with some new approaches or tools to delivering integrated program messaging.
- EE and DR are better integrated than either is with DG.
- The November 2011 IDSM Training seemed like a well-rounded program, although some way of reinforcing the messages received there, possibly with smaller, more frequent meetings, and/or highlighting of IDSM success stories in progress, may help to reinforce the themes of IDSM.

3.1.5 Recommendations

- Have more frequent, smaller training sessions and meetings highlighting the themes and techniques of IDSM.
- Raise the level of emphasis and education of SCE’s staff on DG options so that they become advocates and experts and help their customers with DG projects.
- Measure the effectiveness of the training sessions in achieving more integrated projects.

3.2 Pilots

The Pilot programs that have been selected as IDSM Pilots were initially designed for other purposes, but because they incorporate two or more of the IDSM domains, they have been selected as IDSM Pilots as well. This will be further described below. Interviews were conducted with managers of the following Pilots:

1. Food Processing Pilot;
2. Sustainable Communities Pilot; and
3. DR Pilots in the IDSM Portfolio.

In addition to the interviews, various documents were reviewed which are referenced.

Summary of Pilot Integration

All of the pilots exhibited some degree of integration of EE, DR and DG, as follows:

- The Integrated DSM Food Processing Pilot is integrating EE and DR.
- The Sustainable Communities Pilot is integrating EE, DR, DG, Greenhouse Gas reductions and water conservation.

- The DR Pilots in the IDSM Portfolio are integrating EE and DR.

All of the Pilot program managers interviewed expressed a good working knowledge of IDSM.

3.2.1 Integrated DSM Food Processing Pilot: SCE-L-003

According to the interviewee, the Food Processing Pilot has several objectives. First is the identification of EE and DR opportunities in a food processing environment, specifically, the inclusion of DR opportunities in audits that were formerly focused on EE. Second is the selection of mid-sized (200-500 kW) businesses with complex, end-to-end processes, that is, companies that grow, harvest, and process their products, but that are not large enough to have an in-house energy champion. Third, the Pilot is testing the addition of a Resource Energy Manager to the process.

A Resource Energy Manager is a third-party contractor who is responsible for finding mid-sized food processors that meet the above requirements and that have the financial means to carry through projects. The Resource Energy Manager is the energy champion. The Pilot is testing the feasibility of using Resource Energy Managers to improve the completion rates of EE and DR projects. This Pilot is aimed at the mid-size food-processing segment because SCE believes it has substantial energy saving potential, but customers are busy running their businesses and do not have a focus on achieving energy savings and completing projects. The Resource Energy Manager is being brought in to the process to see if the provision of an energy champion knowledgeable in EE, DR, and available IOU programs can help bring more projects to completion.

The Resource Energy Manager must pre-qualify customers before the audit. The Resource Energy Manager provides the account executives with a customer usage evaluation template to screen customers for load characteristics which make them a good target for implementing both EE and DR projects, targeting summer month usage demand data fluctuations³. The account executive then evaluates the target customers and adds or deletes customers based on factors such as their recent participation in SCE programs, availability of funds for participation, or lack of an internal energy champion. The Resource Energy Manager then coordinates the customer contact with the account executive and a phone or in-person screening interview is scheduled.

If the customer is then found eligible to participate, the Resource Energy Manager does the audit, the preliminary engineering review, scopes the project, and puts some scenarios and financial projections together that would meet the customer's needs. The Resource Energy Manager presents the proposed project to the customer. If the customer decides they want to move

³ Integrated Demand Side Resource Energy Management for Food Processors Program, Program Marketing Plan, TRC, Revised on March 19, 2012, p. 2.

forward with the project, or part of the project, the Resource Energy Manager brings in two or three Third Party Implementers that have appropriate expertise to fulfill the customer's needs. These contractors are selected via competitive solicitations and have Purchase Orders with Edison. The Third Party Implementers make presentations to the customer as to their qualifications and approach that they would propose, and the customer selects one, or two if the projects are specialized.

The Resource Energy Manager is incented to not spend time on customers that are not likely to lead to projects by the terms of its contract with SCE. The Resource Energy Managers are paid on a time and materials basis, but their contract will be terminated if at least 10 out of 14 of their integrated audits do not result in customers continuing on to implement EE and DR projects⁴. Resource Energy Managers have incentive to stay and work with the customer through a project's phases.

The Resource Energy Manager supervises the Third Party Implementer as the work is undertaken. The Third Party Implementers are paid on a "pay for performance" basis. The Resource Energy Manager watches over them to ensure that all the elements are done properly: the energy calculations, the paperwork to apply for incentives, the pre and post savings measurements, and that the incentives are delivered to the customer. The interviewee believes that this will help drive up the net-to-gross ratios because they are targeting customers who, without this help, would likely do nothing.

Marketing and Outreach

The Resource Energy Manager is also doing an outreach effort to industry and associations relevant to the mid-sized food processing segment. It will include a number of organizations, such as the CA League of Food Processors, the California Farm Bureau, Refrigerating Engineers and Technicians Association, as well as the California Climate Action Registry, among others⁵. The Resource Energy Manager will develop several pieces of marketing collateral for industry trade show, meetings and other outreach activities, including a brochure, DR program summary, web content, targeted direct mail, customer presentations, presentations for industry meetings and contributions to industry publications, subject to approval by the SCE Program Manager⁶.

The interviewee felt that the Resource Energy Manager and the Third Party Implementers are well trained on IDSM. Their contracts were updated adding incentives for the number of customers they sign up for DR programs. The Pilot does not include DG technologies.

⁴ Ibid, p.1

⁵ Ibid, Appendix A.

⁶ Ibid, p. 6.

Budget and Spending

The budget of \$689,060⁷ may not be spent because the Pilot started at the end of 2011. Because of the downturn in the economy, it is hard to find customers who have the capital to do projects. If possible, the interviewee would like to have the unspent funds roll forward into 2013-14.

Potential Issues

One area that the interviewee felt may be a problem is if the customer does not want any of the Third Party Implementers that have been prequalified and given Purchase Orders in the program. If the customer wants to bring in their own installers, who are not among the recommended contractors, SCE cannot pay for them. The qualifying equipment can still be submitted to receive the incentives, but SCE cannot pay for the installation and other services.

3.2.2 Sustainable Communities Pilot: SCE TP-034

General Description

The interviewee manages a group of project managers; one of the managers is managing the Sustainable Communities Pilot. Three years ago, he himself managed and wrote the Program Implementation Plans and the Advice Letter for the 2009-11 program.

The Sustainable Communities Pilot was originally part of the 2006-08 Pilots; then it was included in the 2010-12 program plans. The interviewee thinks the CPUC staff selected Sustainable Communities Pilot to be an IDSM pilot.

Originally, in 2006, the Sustainable Communities Pilot was studying Master Planned Communities, high-performance buildings, and how best to intervene to create sustainable communities. The economy was booming and many buildings and communities were going up. This was also when the Strategic Plan and the Big Bold Energy Efficiency Strategy came out with emphasis on market transformation, Zero Net Energy, and IDSM. Given the updated emphasis of the Strategic Plan, SCE repositioned this Pilot to address some of those initiatives.

In the 2006-2008 program cycle, Sustainable Communities Pilot was a Resource Program, paying incentives and claiming savings. However, according to this interviewee, treating the Pilot as a Resource Program caused problems internally, because it was competing for customers with existing Programs. Hence, the Sustainable Communities Pilot was reconfigured to be a Non-Resource pilot. Designating the Sustainable Communities Pilot as a Non-Resource Pilot enables it to serve as a conduit into existing Programs. The Pilot identifies a project and takes it through final design, and then it is picked up by one of SCE's existing new construction Resource Programs, which pay out the incentives and claim savings.

⁷ 2009-2011 SCE Energy Efficiency Plans, March 2009, p.1

There are four design objectives or purposes to Sustainable Communities:

1. To promote ZNE commercial buildings;
2. To promote ZNE residential buildings;
3. To promote holistic, whole neighborhood designs; and
4. To coordinate the DSM team on special projects, such as the Santa Catalina Island Initiative.

The whole neighborhood designs area was where SCE expected to do IDSM work. It was intended to integrate not just EE, DR, and DG, but also water and Greenhouse Gas (GHG) reductions, from lower-emission transit corridors and better planning. But because of the downturn in the economy, there hasn't been as much work done in this sub-pilot area as in the first two categories. Also, pertinent decisions at the CPUC and the Air Resources Board that were expected and necessary for SCE to quantify the energy value of water saved and GHG reductions have been delayed. Hence, while the Pilot was intended to track the influence of the program over factors such as water conservation, reduction in heat islands from skinnier roads in planned communities, reductions in vehicle miles traveled and GHG emissions, these have not materialized.

When the program was initially conceived, it was not intended to be an IDSM pilot; it was trying to achieve many of the Commission's directives, particularly ZNE buildings and achieving the CPUC's Big Bold Energy Efficiency Goals such as market transformation. IDSM became more of a priority in the 2010-12 Plan.

Residential and Commercial ZNE

There has been considerable progress in residential and commercial new ZNE buildings and the Santa Catalina projects. A production home is being built, the ABC Home (for Affordable, Buildable and Certified). It is a mass production prototype home, on a 1,600 square foot slab, single family detached, and will show that a high efficiency home can be built relatively inexpensively. The intent of the Pilot is to hold the home open for a year for tours and monitoring, and to start building a second home, with the goal of building a new home every year. The interviewee emphasized that because the home will be very efficient, and self-generating, it will have limited DR potential. Loads that can be turned off will already be off, with plug sensors and controls; lighting will be absent or turned off when not needed because of daylighting design and occupancy sensors.

The rollout of SCE's smart grid has been delayed but many technologies, like in-home displays, programmable communicating thermostats, Green Plugs, (that turn off all the non-essential plug loads when the occupant leaves the house,) and other circuit-level controls will be demonstrated

in the house. SCE will explore how to integrate smart, communicating appliances and pricing signals as the Home Area Network infrastructure becomes available. (See Section 3.7.1 below)

On the commercial new construction, SCE relocated the DR piece to the core new construction Program, Savings by Design, because there was not a lot of potential as an integrated Pilot piece. In this interviewee's opinion, if really aggressive efficiency is pursued in a new building, there is not a lot of DR. Dimmable ballasts, energy controls and energy management controls already exist in a lot of new commercial buildings, so it was not clear what the Pilot would do in addition to what was already occurring in the market. The new construction sub-pilot was moved to the larger Program, where there are more projects and more market data can be gathered.

In retrofit commercial, SCE has released an RFP for an entity to do outreach to leasing agents for commercial Class A office space. This RFP originated because SCE does not have the capacity to do pre-and-post metering on every office, and lacks the domain expertise and language of office leasing agents. The RFP seeks a firm that is experienced with leasing office space that will set up tenant improvement guidelines for building owners. The tenant improvement guidelines will be marketed to building owners with the goal that they will ask their new tenants to upgrade to high efficiency equipment in every office, when it turns over. Importantly, there is a relatively small group of brokers that work with the vast majority of Class A office space. The aim of the RFP is to find one of them that will take on a "gatekeeper" role, to work with building owners and leasing agents, to show how working with these entities can result in more integrated DSM office spaces.

The firm chosen will try to get building owners to make the guidelines a policy for their buildings, and to highlight the incentives and the benefits that are available to new building tenants through SCE's Programs. SCE assumes that new customers redecorate and reconfigure their offices, tearing out the old equipment and will have to replace them with equipment meeting Title 24. Incentives will go to improvements at least 20% beyond Title 24.⁸

The interviewee also suggested that the measurement and reward metrics may need to be changed in order to increase the effectiveness of this Pilot aimed at the Class A office turnover opportunity. He suggested that a metric using dollars saved per retrofitted square foot via the Program incentives would be easier for leasing agents to communicate to building owners and prospective tenants.

⁸ Southern California Edison, 2010-2012 Energy Efficiency Plans, Sustainable Communities, February 2011.

Catalina Island Initiative

The intent of the Catalina Island Initiative is to “bend the growth curve downward” and integrate demand-side, water, waste-water, and renewable supply side strategies.⁹ The Catalina Island project is a self-contained micro-grid with constrained supply because on-island generation is curtailed due to air quality regulations. Traditionally the island has had lower penetration of EE than mainland customers of SCE. SCE has brought personnel from their small commercial and low income programs to the island. The island’s electric load is driven by water heating, not AC as is common in most of SCE’s territory. Hence, there are fewer opportunities for AC cycling and other DR Programs. As a result, the focus of this part of the Pilot has been primarily EE. The interviewee did not provide an assessment of the Initiative’s progress in achieving its integration goals or whether the utility’s representatives are marketing solar to displace the on-island generation constrained by air quality regulations.

The water desalinating plant on Catalina has been a focus of the Sustainable Communities Pilot. The island has critical water supply issues but the desalination plant uses a substantial quantity of electricity. The Pilot is attempting to achieve deep energy reductions at the plant.

Metrics

The interviewee reports the following metrics achieved for the Sustainable Communities Pilot, giving the source as the 2011 Annual Report – February 2012:

1. Number of ZNE projects in which intervened, for both commercial and residential: 10 projects.
2. Number of master planned communities in which intervened: 2
3. Number of ZNE homes that have been built: 45
4. To show how the intervention communities improved, taking the Leadership in Energy and Environmental Design Neighborhood Development checklist and showing that the communities have been brought to a higher score.

Successes and Setbacks

SCE’s approach to integrated EE, DR, and DG was to find the least-cost way to achieve ZNE new construction. Therefore, it was essential to combine EE and DG in the most economical way. Although the old EE thinking was that EE will always be cheaper than on-site generation, as the “low hanging fruit” is picked, EE gets more expensive, while the cost of solar is falling. SCE is using the Building Energy Optimization Tool (BEPOT) to model the cross-over point where EE becomes more costly than solar. The Building Energy Optimization Tool is a simulation tool designed to help builders get to a particular targeted reduction in usage, given

⁹ Sustainable Communities, SCE-TP-034, February 2011, p.3.

that each builder has different costs, with different suppliers. This interviewee stated that use of this tool reveals that somewhere around a 45% reduction in electricity consumption it becomes cheaper to generate a watt than to save it.

Integration Issues

The interviewee stressed that in new buildings that have been designed to be maximally efficient, there is little DR potential. There is significant effort underway to “float the peak”, which is a term referring to efforts to move a building’s peak consumption to a period that is non-coincident. “Zero Peak as a means to Zero Net is what we’re driving for,” by using measures such as thermal mass and evaporative cooling.

Another issue that impacted SCE’s efforts in new ZNE commercial buildings is that there is a significant difference in the regulatory requirements between the reservation times in the EE and CSI programs. The CSI has a 12 month window over which the system must be designed and installed or the incentive reservation is lost, while EE incentives have a 48 month reserve period. Given the short reserve period for solar incentives, most commercial building developers cannot lock in solar incentives when they design a project, since all but the smallest projects take longer than 12 months to design and build. As a result, the Sustainable Communities Pilot was unable to get builders to include solar in their commercial new construction designs.

In contrast, the ZNE residential new home construction program has been able to combine the EE and CSI programs. Within the residential sector EE and CSI have the same 36 month reservation period. In addition to the ZNE residential new construction program, the New Solar Homes Partnership is also working well. Within the New Solar Homes Partnership, the builder commits to a 15% improvement over Title 24 prior to installing solar.

The interviewee also expressed frustration with the inability to use solar thermal to achieve ZNE. Although solar thermal has been in Title 24 since 1978, and is defined as an EE measure in the Policy Manual, this interviewee reported that staff at the CPUC’s Energy Division have expressed the opinion that solar thermal is 1) a DG source and not EE, 2) that new construction with electric back-up is explicitly excluded and 3) solar thermal cannot therefore be counted toward overall energy performance. The interviewee stated that this is a problem, since the current definition of ZNE is onsite energy, and that all available energy must be gathered off the roof to result in no net purchase from the grid. This definition has lead builders toward all-electric houses. Particularly in a heating climate, solar thermal will be vital to offset space heating, but ED staff’s current interpretation effectively prevents solar thermal in new construction from being used for space heating.

In this interviewee’s opinion, the CPUC’s structure for EE, DR, and DG is also a problem for implementing IDSM. “The DR people have their timelines and reporting requirements and the

EE have different ones, and then the CSI and the self-generation are another set, with different pots of money funding the different programs.” The interviewee says, “We get asked why we’re not doing a better job of integrating, but we feel kind of hamstrung”.

The CPUC has addressed this, in its recent Decision 12-05-015 (May 18, 2012), as follows:

“We urge all Integrated Demand-Side Management taskforce representatives to actively participate in the service lists for all applicable proceedings to develop of a record in each proceeding that would aid in developing a policy, funding opportunities, and mechanisms to promote integration of demand-side energy resources. We also urge the utilities to include in their revised Integrated Demand-Side Management 2013-2014 PIP a plan for how they will coordinate and participate in and between demand-side resource proceedings going forward.

Additionally, it appears that with the adoption of this Decision, the DR portfolio cycle of 2012-2014 and the EE portfolio cycle of 2013-2014 will be in sync starting in 2015. Since not all of the relevant resource proceedings are on concurrent cycles, it is reasonable for the utilities to make their proposals and funding requests for demand-side resource integration activities in their EE applications. We direct the utilities to include the DR, distributed generation, and relevant AMI-portions of their Integrated Demand-Side Management-related costs in the Integrated Demand-Side Management budget requests included in their applications, with justification for why funding should be continued.”

Budget and Spending

About a quarter (\$2 million) of the \$8 million budget for the Pilots has been spent. The SCE management decided to prioritize Resource vs. Non-Resource spending.

AMI Integration

The slow rollout of Smart Connect/AMI Integration has limited the ability of the IDSM Pilots to incorporate AMI enabled technologies. The Affordable, Buildable and Certified house will be a resource for marketing and demonstrations of how to integrate new technologies and AMI.

3.2.3 DR IDSM Pilot Programs

The interviewee has been in this position two years, managing all the DR pilots in the IDSM Portfolio, as well as the Rotating Outage Program and the IDSM Marketing Program.

General Description

The IDSM Pilots include:

- Residential new construction,
- Commercial new construction,
- Workforce Education and Training Smart Students Program,
- Technology Resource Incubator Outreach Program (TRIO), and
- IDSM Food Processing Program.

According to the interviewee, the main theme is integrating existing EE with existing DR offerings to achieve a consolidated portfolio of programs.

1. Residential New Construction

This program integrates with the California Advanced Homes Program to build homes that exceed Title 24 by at least 15%, and provides support to the builders if they choose to install energy management systems that enable DR. An important component of this effort is the Home Area Network (HAN) technology. The Home Area Network lab is testing and piloting limited releases of the system. This Pilot is waiting on the Home Area Network technology to become available). According to this interviewee, at present, those contractors that install energy management systems have to connect at the electrical panel. Once the Home Area Network is in place, the home can be truly responsive through the purchase of smart appliances that respond to system signals, or avoid operation during higher price periods.

2. Commercial New Construction

This program focuses on larger commercial customers to design new buildings that are not only efficient but also demand responsive. It leverages Savings by Design, EE Customers with demand greater than 200kW get incentives for installing an energy management system (EMS) that enables them to respond to system signals. If they receive the incentives, they must participate in a DR rate.¹⁰

¹⁰ The Critical Peak Pricing Program (CPP) asks customers with demand greater than 200 kW, on a day ahead basis, to reduce load up to 15 times during peak periods. In return, the customer receives reduced monthly on-peak demand charges throughout the summer.

One lesson learned from the Pilot is that they are entering the commercial new construction market too late during the design process. By the time the Pilot learns of a new building going up, the builder and owner already have a design in mind. Since some of the most dramatic EE improvements can be accomplished via fundamental design elements like building positioning, day lighting and building envelope choices, timing in the design phase is a significant issue to resolve. The Pilot is seeking to move the program upstream, to pre-educate the engineers, architects, and designers, through memberships in professional organizations, putting on seminars, leveraging SCE's energy education centers to have classes that are designed for this demographic.

3. Workforce Education and Training Smart Students Program

The Smart Students Program is focused on K-12 schools and university campuses. It develops age-appropriate curriculum and delivers it through classroom environments. The college-level classes try to leverage existing sustainability curriculum or the Alliance to Save Energy Green Campus Program. For K-12 students, there are Living Wise kits that the children can take home with special activities. SCE enhanced the classroom curriculum to incorporate DR. The classroom lessons have the children auditing their classrooms with wattage meters, looking at vampire loads, and provide worksheets to calculate how many days of the year and what times of day an end-use is on and not being used, along with rate schedules so they could calculate how much energy costs during those periods.

4. Technology Resource Incubator Outreach Program (TRIO)

The TRIO program is an outreach program for inventors. It tries to stimulate inventors, through symposiums to design EE technologies that also enable DR. As the smart meters roll out, SCE is looking for technologies that enable the meter to communicate into the home.

5. IDSM Food Processing – (See Separate Interview Above)

Metrics

These are Non-Resource Pilots that feed into Resource programs in most cases. (See metrics for the Food Processing Pilot and the discussion of the metrics for the promotion of ZNE commercial buildings, above.) For the schools/education program, the metrics are very difficult to track. There may be long-term benefits associated with the education programs but determining their impact would require process evaluation and the studies may require long time horizons.

Issues

In the opinion of this interviewee, the delay in the Home Area Network platform deployment has slowed the progress of incorporating DR in residential new construction.

Because these pilots are in the DR funding cycle, they have only one year of Bridge Funding, but they are going to apply for more funding in the EE cycle. They would have liked to do an evaluation study, but do not have time before they have to file in July 2012.

This interviewee felt that the IDSM effort has led to extensive communication of the IDSM goals throughout the SCE organization. It has spurred integration in ways that might not have been originally conceived. It has extended IDSM into the mindset of contractors that go into homes to help low-income customers. In addition to qualifying and evaluating low income homes for EE and DR, contractors are now informing customers about several new on-line tools that are integrated, including encouraging customers to enroll in My Account and to undertake the new integrated audit. The interviewee reported “they’re asking for more” ways they can help customers save money.

3.2.4 Conclusions

- **Food Processing Pilot.** Introducing a Resource Energy Manager (REM) with specific incentives to see projects through to completion is a promising innovation.
- **Integrated DR Pilots.** A number of DR applications will be enabled once the Home Area Network (HAN) testing is complete and the Home Area Networks are deployed into the residential new construction pilot.

3.2.5 Recommendations

- **Food Processing Pilot:** If the introduction of the Resource Energy Manager to the process is successful in achieving a higher percentage of completed, integrated projects, it should be emulated in the Programs. As in this Pilot, this could be achieved by linking renewal of contracts with third parties to the number of their completed, integrated projects in their current contracts.
- **Integrated DR Pilots:** Outreach needs to occur earlier in order to reach building architects and developers before design begins in order to achieve maximum savings and DR, through professional organizations, events and educational seminars aimed at this sector.
- **Overarching:** Both the California New Homes Program and the New Solar Homes Partnership require that new construction of residential homes that receive incentives should be at least 15% more energy efficient than Title 24. As more DR technologies become enabled for the home, both Programs should include incentives for DR as well and possibly be merged into one Program.

3.2.6 Recommendations for the CPUC

- ***Sustainable Communities Pilot:*** There should be a consistent reservation period between new construction EE and CSI reservation periods in order to incent builders to design new buildings with both solar and maximally efficiency equipment.
- ***Sustainable Communities Pilot:*** Solar thermal should be included in technologies that qualify for ZNE construction since hot water produced during peak periods is valuable.
- ***Organizational:*** The CPUC could ask its own staff to model integrated behavior for the IOUs by establishing inter-DSM protocols for meeting guidelines and coordination between EE, DR and CSI/SGIP staff.

3.3 Emerging Technologies

3.3.1 Introduction

At the time of the interviews conducted for this research, SCE was tracking three Integrated Emerging Technologies programs: Office of the Future (OTF), Internally Illuminated Menu Boards for Multiple Applications, and Smart Corridor Bi-Level Lighting for Office Applications. Additional emerging technology projects are added on an ongoing basis. The Technical Specialist and Founder of Office of the Future were interviewed for this report.

Office of the Future was started in 2006, and the essence of the effort was “to do a systems approach, not a widget approach.” The program includes integrating chillers, control platforms which enable DR, ballasts and lighting. The core challenge of the project was to determine how, and where, to do an integrated approach. “Everything must have the capability to do both EE and DR.”

The Office of the Future is focused on leased office space automation of EE and DR. DG is not addressed, as a typical leased office retrofit or redecoration would not involve consideration of DG

Development of the Office of the Future

SCE decided to focus on the office environment for several reasons. First, the sector was not achieving the desired level of EE and DR program participation, and SCE wanted to understand why their participation was lagging. Second, office spaces are usually clearly delineated both in square footage and in end-uses, making them easier to define and measure than some other non-residential sectors. Finally, the sector generally utilizes a lot of leased space, so it offers the opportunity to study the challenges inherent in the landlord-tenant energy consumption decision making process.

Initially, SCE hired consultants to go out and measure a sample of office buildings' plug loads, to develop a baseline of how electricity was used in offices. Then, an Office of the Future Collaborative was created, led by SCE, with a number of the largest utilities in the U.S., the CA Lighting and Technology Center at Davis, and the DOE. All of the utilities were to run pilot programs focusing on various aspects of Class A office space, with customers that had multiple sites around the country. Four years ago, the New Building Institute was brought in to be the project manager and collect and collate the data from the utility Office of the Future pilots. Three utility pilots have been completed, including this Pilot.

An outgrowth of the program was that the California Advanced Lighting Training Control Program was begun because SCE found that contractors were installing control equipment incorrectly. This program trains contractors on correct installation procedures for lighting controllers and other equipment new to the lighting market. Another achievement was the inclusion in Title 24 of controllable ballasts, so that all new commercial and industrial ballasts installed in California will be, by code, required to be able to respond to signals sent by controllers. "This also came out of what we learned in OTF."

Office of the Future Projects and IDSM Knowledge for Emerging Technologies

There are three projects in SCE's Office of the Future program:

1. Landmark Square/Brookfield Office Properties

This project involved a 2000 square foot office suite where an integrated system was installed, including:

- T8 fluorescent lamps with dimming and ballast controls, along with CFLs and LEDs;
- targeted light levels for each space's lighting needs;
- occupancy sensors;
- daylighting sensors;
- dimming controls;
- after-hours lighting controls;
- programming lighting controls to automatically respond to DR events; and
- plug load devices, which control the consumption of active and switch off inactive equipment.

This project achieved a 75% reduction in lighting energy use and a 35% drop in lighting during a DR event.¹¹

2. Wilshire Federal Building, FBI

One half of the 12 floors of the Los Angeles Federal Building, where the FBI is housed, was the treatment area. The east half of the floor was relighted using state-of-the-art technology, and the west half was left in its original condition. Energy monitoring before and after the relighting allowed actual energy savings achieved to be tracked. Additionally, the new lighting is responsive to DR signals. One of the challenges faced by the project was the presence of asbestos, which resulted in the lighting system being attached to the furniture. The building also had not had seismic upgrading; over 12,000 lbs. of old light fixtures were removed from the ceilings to lessen seismic loads, and a new ceiling using reflective ceiling tiles was installed to increase efficiency.

The results show that a high-performance lighting design with controls delivers much greater savings than code-calculated estimates; the sum is much greater than the sum of the parts. *During daytime occupied hours the site's consumption is roughly half of what simple code calculations would predict.* Comparing the treated half with the untreated half of the floor, the new system reduced the connected load by 56%. The DR of the lighting and control systems was monitored in one-minute intervals. Testing was conducted on five occasions during the same hour on three different days in July of 2011. Five different settings in the DR levels were used: 10%, 15%, 20%, 25%, and 30% reductions were tested. The response at 30% setting was .073W/sf, for an average power savings of 17%.¹²

The results also revealed how complex it is to measure and monitor loads. For example, the workstation task lights were included in the plug circuit measurements, while the lighting circuit and the plug-load circuit were monitored separately, due to the specific configuration and constraints of this work space.¹³

3. Edison GO 4 Executive Suite

This project targeted Class A executive office spaces, using Edison's own executive offices on the fourth floor of a building owned and managed by SCE. The 14,635 square foot space has 20 occupants in 10 private offices, an open office area and a video conference room. The lighting was last updated in 1999; the building was built in 1984. The goals were to 1) test the performance of highly controlled lighting systems in a real office compared to existing lighting

¹¹ SCE Energy Management Success Story, Brookfield Office Properties, 2011 brochure NR-780-V1-1211, p. 2.

¹² Office of the Future Demand Response Tests at a Typical Office Space in a Federal Building, December 2011, p.2.

¹³ Office of the Future Federal Building Demonstration, August 2011, p. 2

and applicable codes; 2) monitor plug load energy use; 3) test the DR capabilities of an advanced lighting control system (ACLS); and 4) provide measured and technical data back to Office of the Future consortium members. The results showed that “a high performance lighting design with controls delivers savings considerably beyond code-calculated estimates. Measured results show that during daytime occupied hours the site uses, on average, at least 54% less energy than code calculations.”¹⁴ Following the program installations and activities, on-peak demand declined by half. A similar testing strategy for DR to that in the Federal Building was followed, with five different levels and three testing events in September of 2011. A similar level of DR from the advance lighting control system managing the lighting was observed, with a drop of 0.07 W/sf at the 30% DR setting. The new system of high-performance lighting design with controls reduced the connected loads by 53%. The lighting system redesign also improved the aesthetics of the work environment through changes in illumination levels, contrasts and remote controls.¹⁵

Proof of Concept

The goal of the Office of the Future project was to determine the efficacy of a systems approach to lighting. All of the demonstrations discussed above illustrate that a systems approach to lighting has the potential to reduce energy consumption and peak demand. These pilot projects showed that it was possible to incorporate both EE and DR into a lighting retrofit in an office setting, helping to achieve both energy reduction and peak demand savings during critical events.

There have been many challenges with the Office of the Future project. Challenges highlighted by the interviewee included:

- 1) Inter-device Communications: Although these Pilots were designed with systems components that communicate with each other, in the general market it is a challenge because some of the technologies are proprietary, and do not communicate with other components. The interviewee stated that the manufacturers recognize this and are working on the problem.
- 2) EMS System Simplification: Some of the dashboards of the controllers, the energy management systems, are not intuitive, and require too much time to train the building manager. They need to be simplified.
- 3) High First Cost: Dimmable ballasts are still about a third more expensive than standard ballasts. Dimmable ballast saves a lot more energy relative to standard ballast so they have a short payback, but the initial cost is relatively high. To help overcome the higher initial costs, SCE has the first dimmable ballast incentive in the country.

¹⁴ Office of the Future Executive Suite Demonstration, June, 2011, p.1

¹⁵ Ibid, p.2

4) Human Factor Variability: Five buildings could be exactly the same, but get five different results when the equipment is put in because of the people that occupy the buildings and how the buildings are used. It makes it difficult to quantify and forecast with confidence the average reduction in energy reduction and peak demand.

5) Underestimation of Savings from the Integrated Systems: The CPUC requires the use of Title 24 as a baseline, but this interviewee believes that is not reflective of reality and undervalues the savings achieved from integrated systems. In his experience, most existing office buildings, for whatever reason, are consuming much more than their Title 24 allotments. But because the CPUC allows only the improvement over Title 24, when an integrated system goes in that achieves a 50% improvement over what the building was consuming before, SCE can only claim an improvement of 30-40%. The interviewee believes the Title 24 baseline is a good baseline for new commercial, but not for retrofit, unless the office is turning over.

Inclusion of Integration-Enabling ET

The Office of the Future tests have shown that more energy can be saved with integrated systems than is predicted by the sum of the DEER-endorsed calculations for the measures installed separately. The additional reduction in usage and peak demand from an integrated systems approach using both EE and DR elements is substantial and validates the CPUC's vision in its emphasis on IDSM in the Strategic Plan and subsequent orders and decisions. But, since the CPUC is using a measure-by-measure approach to estimate impacts, and the Account Reps have kWh and kW goals to meet, this interviewee stressed that the reps are not doing as much as they could be if the CPUC *really* endorsed it by adopting impact measurement goals that incented integration via some separate, specific goal for integrated projects. When the CPUC urges the utilities to do integrated systems, but only gives incentives on a measure-by-measure basis, the result is likely to be fewer systems are installed that are designed to be completely integrated than may be possible with an incentive mechanism that is specifically rewarding the installation of integrated projects.

The interviewee believes that a much greater energy and peak saving could be achieved, for example, if instead of simply giving incentives for this ballast and that bulb, "if you also put in an occupancy sensor, a well-designed lighting system, a daylight harvester, and a controller, then you'd have a huge impact. It's more expensive, but it has far greater results. It's not happening because of the way the rewards are structured and the baseline being set at a level that is higher than it is in reality, and the Account Reps not getting credit for all the extra hassle." The interviewee went on to propose that the solution to this is to go to performance-based rewards, which would reward on the basis of the delta between what the building consumed before and after an integrated system went in. That would result in a much bigger incentive for the

customer as well as the Account Rep and the utility. He made the comment: “If we don’t do that, or something like it, we’re never going to get to the Commission’s goals.”

3.3.2 Conclusions

- The Office of the Future is an exciting and promising area of research, and SCE’s leadership of the consortium has placed it and California in the forefront of national R&D into how to drive down energy costs and consumption in this important sector.
- According to the Office of the Future studies previously cited, the additional reduction in usage and peak demand from an integrated systems approach using both EE and DR elements is substantial (reaching 75% reduction in energy use and 35% DR in lighting, in existing buildings). This validates the CPUC’s vision in its emphasis on IDSM in the Strategic Plan and subsequent orders and decisions.

3.3.3 Recommendation

- Since the CPUC is using a measure-by-measure approach to estimate impacts, and the Account Reps have kWh and kW goals to meet, more EE and DR could be accomplished if some way of measuring and incenting an integrated systems approach to building retrofit was created, either by before and after performance measurement or by some other means.

3.4 Integrated Home Audit

As defined in Decision D. 09-09-047, the California IOUs have been directed by the CPUC to develop cross-utility standardized integrated audit tools in an effort to identify integrated strategies to reduce and conserve energy. According to the statewide IDSM PIP developed for the 2010–2012 program cycle, evaluation studies over the last decade have provided evidence to show that energy surveys and customer site audits are powerful tools that develop customer awareness and identify energy conservation potential using EE, DR, and DG programs and technologies. By providing customers with customized information about available EE programs, energy conservation tips, how their rates are affected by energy use on “reduce your use” event days, and how solar panels can reduce demand for energy provided by the IOUs, integrated audit tools could help them develop a broader understanding of how various demand side management options can be integrated.

The CPUC directed the IOUs to develop standardized audit tools that will customize audit recommendations in the same way based upon customer profiles, operating characteristics, market sector potential, and cost-effectiveness of the recommendations. The PIP lists the following areas that are to be incorporated into the development of the IOUs’ Integrated Customer Energy Audit Tools (ICEATs).

- Incorporate electricity/gas, EE, DR and self-generation analysis in all tools and single customer report for each type of audit, as appropriate.
- Incorporate water conservation analysis in association with electricity and gas savings.
- Incorporate green house gas reduction calculators and/or conversion tables, as applicable.
- Refer to or incorporate in audit tools applicable rate analysis modules as appropriate.
- Incorporate IOUs' adopted and recommended emerging technologies, as appropriate.
- Coordination with the nonresidential Continuous Energy Improvement (CEI) sub-program.¹⁶

Development of the integrated audit tools by the IOUs has been ongoing over the program cycle and during the spring of 2012, each of the utilities have been presenting the capabilities of their tools to the CPUC. Appendix C of Advice Letter 08-07-021 lists the Characteristics Expected of Enhanced Energy Audits and Expected Integrated Audit Report Content, and SCE followed this template in developing its tool.

3.4.1 SCE's Residential and Small Commercial Integrated Audit Tool

The lead Project Manager in SCE's on-line residential energy audit tool, Home Energy Advisor, was interviewed. He explained that SCE experienced delays in issuing its RFP for the tool, which specified a launch date of March 31, 2012. The firm that was initially selected as SCE's top choice was unable to meet that launch date and the launch date could not be moved back. Hence, it was awarded to a second contractor, Efficiency 2.0, which could meet the release date. Home Energy Advisor launched in late March, 2012. This interview was conducted in April 2012.

3.4.2 Program and Integration Goals

The Home Energy Advisor (HEA) is a web-based interactive platform, and the requirements for it follow closely the Commission's requirements as given above, with one important exception which will be discussed below. The major update of The Home Energy Advisor from the preexisting tool, the Home Energy Efficiency Survey, is that the preexisting tool is only an EE audit. The new tool is designed to educate about EE, DR, and DG and enable customers to sign up for programs incorporating all forms of DSM. The Home Energy Advisor's DR capabilities are still fairly limited. Two DR programs that are offered at present via Home Energy Advisor are Summer Discount Program (SDP) for customers with central air conditioning (AC cycling) and Save Power Days (SPD) for customers to sign up for reducing demand on alert days (Peak

¹⁶ 2010-2012 Energy Efficiency Programs: SW Integrated Demand Side Management Program Implementation Plan, p.8-9.

Time Rebate (PTR). The Home Energy Advisor does not currently support Home Area Networks (HAN) because these platforms are just being rolled out in testing phases

Customer Implementation of the Home Energy Advisor

An evaluation team member undertook SCE's on-line integrated audit. Upon entering the Home Energy Advisor's portal, the user's zip code is requested, signing up the customer for the program. The audit is not linked to a customer's account number or a customer's billing history.¹⁷ The tool uses proxy data to build a profile, "My Home Profile" for the customer and to come up with "All Actions for You with Estimated Yearly Savings". The tool is interactive; if the user clicks on an action to indicate that they have completed the action, an affirmative statement comes back. For example, "Replace your home lights with CFLs" estimates savings for this user's home as \$91. When "I did it" is clicked, the site responds "Super!" The user is also asked what type of house is lived in, (house, small building/apartment/townhouse) how many rooms, and how many appliances the user has, how washing is done, whether there is an automatic dishwasher present in the house, and so on. More specific recommendations such as washing in cold water are then generated. Next to the recommendations, there is a "Learn More" button which offers "Programs to save more by conserving when many others are consuming on high usage days." If the user clicks the button, another page opens where the DR Programs, Save Power Days and Summer Discount Program are explained, along with a link to sign up for these programs.

The side-bar also includes an "Interested in Solar?" button that takes the user to basic information about the California Solar Incentive (CSI) Program. The tool generates an estimate of the user's electricity consumption and monthly bill, based on proxy data for average dwellings of that type in that zip code. Clicking on a "Next" button asks, as a first step, "Have you considered ways to save energy in your home or business?" "Next" takes the user to a solar cost calculator that asks users to indicate what level of reduction they intend: "I plan to reduce my energy use through energy efficient measures by..." 0% to 30%. When the user indicates what level of reduction they plan, the size, cost and payback of the solar system is presented. In the example this researcher looked at, the system (after EE of 30%) would produce 801 watts, costing \$5,604. The calculation therefore results in a cost of solar of \$6.99/watt¹⁸. After a Federal Tax credit of \$1,681 (there was no CSI rebate given in the example,) the net cost of the system was given as \$3,923. The calculated annual savings was \$176, with a payback of 23 years. Financing options such as solar leases are listed.

¹⁷ The evaluation team member who signed up for the integrated audit was not an SCE customer. The only proof of customer status required is an SCE eligible zip code.

¹⁸ As of 6/13/12, the California Solar Statistics website, which is the official public reporting site of the CSI, gives average cost/watt of <10kW systems as \$7.81.

Clicking on “Getting Started with Solar” takes the user to four steps to start the process: 1) Print the on-line audit, 2) Fill in name, address and date, 3) Choose a solar contractor and set up appointment, and 4) Provide energy audit to your chosen solar contractor who will need to submit it with your application.

The tool is graphically lively and interesting. However, because it has no customer account information and relies only on modeling and self-report to generate its recommended actions it is less useful for households that may have higher or lower usage than a tool that employs actual household usage data. In addition, the lack of actual household usage data may reduce the applicability of the information provided for households whose end-uses are different than the norm in the zip code. The level of specificity that was envisioned in the CPUC’s requirements for this tool is not present, for reasons discussed below.

Integrated Resources and Support

The integrated audit tool is being coordinated on a statewide level, with the initial requirements detailed by the CPUC. SCE’s RFP that was issued closely followed these requirements. One of the requirements was that the tool not be started from scratch, so SCE looked for a vendor that had something “off-the-shelf” that could be modified for its needs. The vendor it selected had a tool with an “extra” feature that SCE believed would be useful, a “rewards program.” This is like a frequent flyer program that offers points and rewards for actions taken. According to this interviewee, the program has been very successful in other jurisdictions in which it has been offered. However, this function of the tool has been placed on hold pending discussions with various departments within SCE. SCE’s E-Commerce department is reviewing the rewards program to ensure that it would be offered in accordance with company guidelines.

Internal/External Integration

Each utility has chosen a different vendor to develop the integrated on-line audit tool that has the required capabilities as given in Advice Letter 08-07-021, Appendix C. According to the interviewee, there were several reasons why multiple vendors were chosen. PG&E made a commitment to a vendor before SCE had even issued its RFP and SCE was not comfortable going along with PG&E’s vendor without an RFP process and the knowledge enhancement that would come from it. It was then thought that SDGE and SCG could team up with SCE but they did not prefer the contractor that SCE chose, so the three/four utilities went with different vendors. However, the company that is now in the process of designing the small commercial audit for PG&E just acquired Efficiency 2.0 so it appears that the market is consolidating the delivery channels independently.

Successes and Challenges

An important success of the effort was its on-time launch. Because it is now live, customer service reps can use the tool to educate customers about EE, DR, and DG Programs which might benefit them. The tool encourages and informs about a variety of EE actions and Programs, such as a refrigerator and freezer recycling program that will pay participants \$35 when their second refrigerator or a freezer is picked up. The tool can be used to refer and sign up customers for the Summer Savings and Discount Programs, as well as giving information about solar rebates and how to get further information about many Programs. The Home Energy Advisor is being used as a gateway for summer readiness marketing programs that will help customers prepare for the possibility of power shortages and the need for them to participate in DR/DG this summer¹⁹.

The most important challenge that SCE faces with the Home Energy Advisor is that it is currently limited to proxy data and not linked to any specific customer data. The reason given by the interviewee as to why the tool can only work with proxy data is that the CPUC's Rule 25 limits the utilities' ability to share customer data with third parties. The data the customer enters into the tool goes to the third party vendor's server, and hence providing actual customer data would be in violation of Rule 25. This rule, issued in July of 2011, makes use of the data from even the pre-existing Home Energy Efficiency Survey problematic, because it, too, is housed on a third-party server. When that survey was first implemented, this rule had not yet been issued, and data could be passed more freely to third parties. Some way around this problem needs to be found in order for this tool to show its full value.²⁰

It may be possible to work around this problem by authenticating the customer data on the utility side, rather than the vendor side, then sending it in some protected form to the vendor. But SCE is not currently able to do this because its website is being re-platformed. The web re-platforming needs to be completed before attempts to authenticate and reformat or protect customer data can go forward.

Marketing

The Home Energy Advisor and the Small Commercial audit tools will be the gateways that customers will be directed to in order to sign up for programs and "get ready" for the possibility of power being in short supply, or very expensive, on hot summer afternoons during the upcoming summer. According to this interviewee, there will be banner advertising, television

¹⁹ The San Onofre power station has been off-line for most of the summer of 2012. The plant has been shut down by the Nuclear Regulatory Commission for serious leaks of radioactive material.

²⁰ According to Mark Martinez, SCE IDSM Task Force Member, as of September 2012 the privacy issues have been addressed and the use of customer-specific data in the on-line integrated audit is expected in December 2012.

and radio ads, emails to targeted sectors, and the new integrated on-line tools will be highlighted during these marketing efforts.

3.4.3 Conclusions

- The integrated home audit tool is lively and fun to interact with and to navigate. But because the home and business energy account data cannot at present be delivered to third parties because of privacy issues, it is of limited value. The actions reported being taken may or may not in fact be taken and so the impacts of any purported action are impossible to estimate with any confidence.
- The portal's linkages to Summer Discount Program, Save Power Days and the Solar Calculator are important integration features.

3.4.4 Recommendations

- Privacy issues with the tool need to be addressed so customer account data can be entered in the enrollment process, enabling measurement of the savings and load impact of actions reported. This recommendation is already being implemented and the tool is expected to be able to utilize and report actual customer data in December 2012.
- Enrollments in Summer Discount Program, Save Power Days and CSI rebate applications (if possible) stemming from the portal should be carefully tracked and recorded.

3.5 Account Executives

The account representatives are on the front lines of utility efforts to integrate DSM. Called account executives at SCE, seven were interviewed for this study, with a broad array of experience. The sample ranged from a very new account executive, who had only been working as an account executive for 10 months, up to a well-experienced, long-term employee with 34 years at SCE. This group had an average of 20 years work experience at SCE and five of the seven had worked at SCE for more than 15 years. The sample was randomly selected from a total of 217 account executives that were invited to attend IDSM training in November of 2011, with two selected because they had not attended training. Obviously, due to the small number of people the budget allowed to be interviewed for this report, this is not a representative sample.

3.5.1 Summary

Account executives oversaw the completion of 78 projects in 2010-2011, some of which were initiated in prior years. The breakdowns for these projects are as follows:

- Sixty-five of the projects integrated EE and DR
- Thirteen of the projects integrated EE, DR and DG

- One account executive oversaw the completion of four projects that included DG; all the other nine account executives that had projects including DG had one each.²¹

3.5.2 Need for Training

As might be expected, the longer-term employees believed they did not need training on IDSM, “We’ve been doing this holistic approach for years.” On the other hand, the newer account executives were eager for training, and for a mentoring program where they could go out with a seasoned account executive to present an integrated approach to customers. One of the longer-term account executives mentioned there used to be a mentoring program of this type for new account executives, and that it was a very effective way for new reps to learn how to present integrated opportunities to customers. “What you’re going to present, what you’re going to take with you, is going to vary by customer type and by size, and it’s not always easy for the new guys, until they’ve gotten to know their customers. It’s like cops on a beat, you can have all the training in the world but when you ride along, watch someone actually doing it, you “get it”, it all comes together.”

Virtually all of the seven account executives defined IDSM as including EE and DR, and while DG was often not initially mentioned. Their failure to mention DG may be reflective of the account executives’ customer base, such as large industrial customers. “DG will be a problem for a lot of my customers this summer, because though they may have it, they can’t run it due to air quality regulations, and that could be a problem with San Onofre out.” Another account executive who deals mostly with small commercial, in the 0-99 kW range, did not have much opportunity to apply what he knows and has been trained to offer about DR because, he said, the minimum size to participate in the Critical Peak Pricing (CPP) Program is 200 kW and most of the DR Programs apply to this size or greater. The only DR Program presently available to SCE’s small commercial customers is the Summer Discount Plan for AC cycling.²²

The two account executives that had missed the IDSM training, both long-term account executives, did not exhibit a lack of knowledge of IDSM or differ markedly from the rest of the sample in their definitions of IDSM.

²¹ SCE Integrated Projects Data Request Information 2010-2012, March 4, 2012.

²² When small residential customers are enrolled into the smart meters program, they are automatically defaulted into the Save Power Days Program, which gives bill credits to customers who reduce demand during peak periods (2-6 pm) on up to 12 event days each summer. When small commercial customers are enrolled, they are not yet defaulted to the Save Power Days Program rate as it has not yet been designed and approved (personal communication, Mark Martinez, June 28, 2012).

3.5.3 Best Tools and Forms

One of the account executives mentioned a form that he had received at the training, that he felt facilitates IDSM. He subsequently provided it to the Research Team. This “Audit Checklist”, a two page spread sheet, includes 15 different sections as follows:

1. Integrated Solutions EE/DR (Dimming Ballasts, EMS)
2. Energy Efficiency Lighting Recommendations
 - a. Lighting Control Recommendations
 - b. Office Recommendations
 - c. HVAC Recommendations
 - d. Food Service Recommendations
 - e. Compressed Air Recommendations
 - f. Other Recommendations
3. Demand Response
 - a. General (install energy management systems, dim lighting, etc.)
 - b. Industrial
 - c. Other
 - d. DR Program Recommendations
4. Self-Generation Programs
5. Self-Generation Technologies
6. Self-Generation Rate Information

The account executive felt that this was a very helpful form, in fact it was the only thing this interviewee found useful from the training session he attended. It gives not only measures for specific customer types, like food service and refrigeration, but also lists all the Programs that an account executive should discuss if appropriate.

3.5.4 Best Integrated Programs & Funding Issues

Many of the account executives felt that Technical Assistance & Technical Incentive (TA/TI) and Auto DR were the best internally integrated programs. In the Technical Assistance & Technical Incentive Program, technical assistance is provided to customers in the form of free EE and DR assessments and audits, and incentives of \$125/kW are given for equipment that automates response during periods of peak demands. There are many forms of automated load control systems eligible for the Technical Assistance & Technical Incentive program. Qualifying technologies include energy management systems, dual level lighting, remote controlled switches, building automation and other enhanced automation technologies for managing energy consumption and reducing peak load. Customers must enroll in a DR Program to participate in the Technical Assistance & Technical Incentive program.

Many of the Technical Assistance & Technical Incentive participants enroll in Auto DR. The Auto DR Program pays customers incentives up to \$300 per kW of verified load reduction, and applies to non-residential customers with automated load control systems that are on interval or smart meters. Participants must agree to participate for at least 12 months in one of the DR Programs, and have over 200 kW of aggregated demand. At the time the interviews with account executives were conducted (April 2012), the Auto DR program had been so popular that it ran out of money and had been placed on hold, so customers that wanted to join were placed on a wait list. Additional funding has been allocated to the program and the program is accepting new customers.

3.5.5 Barriers to Integration – Issues with the Incentive Applications

All of the senior account executives mentioned difficulties with the incentive application process. It is an on-line process, but once the application enters the system, several of the account executives complained that they lose contact with the application's progress within the system and are not informed if the application has missing data. One account executive said "It takes for-ev-er. If the customer gets one thing wrong, or doesn't fill in something like a code they don't know, the system will kick them out and you won't know. It could sit there on someone's desk for three or four weeks and you don't even know. In the past people would call you and tell you what you needed to fix but no more." Another account executive described multiple layers of scrutiny given the applications: "There is a side of the house that does all the entering on the service contracts, I can't enter them myself. The Center of Excellence, they look for errors. Then another branch oversees the Service Contract. I don't know when or at what point they put it into the Customer Relationship Management (CRM) system, but somehow it's linked in there so we can go in and find the Application number, even though it's not always kept up-to-date." Yet another comment was "the process is terrible. It makes us look like dinosaurs. It needs to be totally revamped. They put projects on hold, we lose momentum, we lose the customer's budget that's been set aside, and we're losing projects." This issue will be examined in the Tracking and Reporting Section later in the report.

3.5.6 Timing of Payments to Third Parties

Several account executives stated that the timing of payments to third-party engineering firms that do the audits and potential installations for larger customers need to be modified. The third parties are firms that have contracts with SCE to do audits and install measures for customers. These account executives felt that the third parties, although vital to the process, need to have their remuneration stream structured differently. While the process varies from customer to customer, the typical process has the account executive bringing in third party engineering firms that have the relevant expertise for the project. The third party engineering firm does an audit, and provides the customer with a proposal that identifies the equipment they recommend the customer install, along with the operational savings, the capital cost, the incentives that are

available for that equipment, and the Return on Investment. The customer decides whether to go ahead with all, part, or none of the recommendations. If they decide to move forward, the Incentive Application is submitted and the third party gets paid most of the money for its services at that time. In the account executives' view, while some of the third party's payment is withheld until the equipment is installed, the fact that most of it is already paid lessens the contractors' motivation to stick with the project until the end.

While it would be natural for the customer to think that once the project has received approval from his/her management, an Incentive Application has been submitted, and motivation and enthusiasm for the project are high, that they will soon be installing new highly efficient and demand responsive equipment, that is rarely the case. Submitting the Application is just the start of what appears to be, from the account executive's views quoted above and from interviews with large customers conducted for another evaluation of CA IOU's EE programs,²³ a very long journey. The customer could be waiting for months for the incentive to be approved, particularly for the Custom Program, a Program which many of the account executives in this sample work with. Sometimes, for complex projects, it can take years for a project to move from Incentive Application to completion. In the interim, while they're waiting for the Application to be approved many business events can interfere with the completion of the project: The customer may run out of capital to complete the project, the program may run out of funds, or the customer may have needed to get the equipment installed for business purposes, so they just go out and install whatever equipment they can get. The interviewees felt that equipment installed outside the Program is rarely the high efficiency equipment incentivized by the Programs.

There is a pilot underway at SCE that is testing a new approach to managing third parties, which is described in Section 3.2.1.

3.5.7 Account Executive Integration Goals

All account executives were questioned about the integrations goals and whether they personally received any additional incentives associated with integrated projects. The account executives reported having kWh savings and kW reduction goals, but no specific integrated goals. There are no additional incentives given for achieving integrated projects, according to this group of account executives.

3.5.8 Customer Integrated Incentive Structure

All of the account executives believe that customers would be more likely to participate in more than one DSM program if the additional participation was itself rewarded, over the incentives awarded for participation in each program. This could be achieved by additional incentives being given, for example, if a customer picked three or more EE and DR measures for

²³ Net to Gross Interviews Conducted in 2012, for WO 33 – Custom Programs Impact Evaluation, Itron.

simultaneous installation, like high-efficiency lighting, dimmable ballasts and motion sensors. Additionally, there were comments about the incentive structure itself. A tiered incentive approach was suggested. The account executives suggest that the largest incentives be provided for costly measures, like chillers and dimmable ballasts, mid-level incentives be given for things like controls, motors, and refrigeration, and less, if any, incentives for lighting, except for LED lighting, for which several account executives suggested greater incentives.

3.5.9 Internal/External Integration

The account executives meet with their teams fairly frequently, at least once a month, but not for the purposes of integration. If one of their team members is doing an integrated project, they discuss it, but it is not the purpose of the meeting. One of the account executives interviewed was very well-integrated externally as the account executive for the State of California and had done multiple integrated projects at University of California and California State University campuses. Another was an account executive whose module included cities and counties, metropolitan water districts and hospitals. Cities and counties, in this account executive's view, were more likely to pursue integrated projects because they have more on-peak load flexibility than do hospitals, and they may have capital for energy projects from state or federal funds.

3.5.10 Marketing

The question "On a scale of 1-5, with 5 being the best and 1 being worst, how well do the marketing materials serve the integration needs of your customers?" elicited an average score of 3.28 among the seven account executives interviewed, and a lot of comment. There was a strong desire for more electronic media, for materials that could be downloaded or called up on cell phones and note pads. It was suggested that the website should have a banner directing customers looking at a specific EE project to click on a link to a DR or DG project that would take them to a video showing an integrated project. Most of the respondents felt that the marketing materials could do a better job of showing the value to the customer of integrated projects. The emphasis among account executives serving larger customers, however, was more on the need to present solutions tailored to the customers' needs, through knowing the customer. "It's not a one-size fits all. If my customer can't do DR because his process requires continuous power, all the marketing and communications in the world isn't going to help me convince him to do it." Another said, "The fact sheets are good, but the most important thing in getting customers to participate is our customer relationships. They know me, they know I'm not going to get them to do something that's not helpful to their business; I'm not going to waste their time telling them about a program they can't participate in."

While most of the account executives felt that the messages that most resonate with their customers were those emphasizing energy and monetary savings from integrated projects, there were a few that felt that emphasizing social stewardship, sustainability, good environmental leadership, was also important and was growing in importance to many customers. "It's about

the bottom line, but it's also important to a lot of customers that they do the right thing, and we should come up with a boilerplate that addresses the whole value chain.”

3.5.11 Conclusions

- The Technical Assistance & Technical Incentive Program and Auto DR were viewed by many of the account executives interviewed as successful examples of integrated programs.
- The incentive application process takes too long, in the view of many of the account executives interviewed.
- Missing data from applications sometimes holds up incentive approvals without the account executive's knowledge. The account executives are not given additional incentives for completion of integrated projects.
- Third party engineering firms sometimes do not stay with projects all the way through to completion.
- Meetings solely for the purpose of discussing integration are not regularly held.

3.5.11 Recommendations

- A mentoring program to specifically focus on how to do integrated sales calls to customers may be helpful for newer account executives.
- The Technical Assistance & Technical Incentive program, combining EE audits and incentives for EE and DR equipment should be emulated, especially as SmartConnect rollout is completed and Programs are designed for the < 200 kW non-residential customers,
- Automatically notify the account executives when an Application is missing data or is stalled for any reason.
- Study the Application review process and find ways to streamline and simplify it; establish time limits for various stages in the process, especially for large customized projects where the customer has set aside large amounts of capital pending project approval.
- Give account executives goals for and incentivize completion of integrated projects.
- Study ways of incentivizing third parties (engineering firms) to stay involved in projects after Applications have been submitted and project is completed.
- Include integrated projects at regularly held sales meetings, featuring “how to,” “lessons learned,” and “challenges.”

3.6 SCE Integrated Marketing and Outreach

Nearly every chapter of the Strategic Plan stresses the importance of marketing, education and outreach (ME&O) and integrated marketing, both between utilities and across DSM programs. Marketing of opportunities across all customer classes is Milestone One. The IOUs are directed to place more emphasis on promoting the “integration message” and identifying examples that more fully integrate all demand-side technologies.

Many different types of SCE’s marketing collateral were reviewed for this report: case studies, two minute videos, bill inserts, and others. The marketing presentation given to the IDSM Task Force at their May 2, 2012 Meeting was reviewed. Two marketing managers were interviewed from SCE’s Customer Experience Management Department (CEM). One Manager had experience both at Edison and another utility company in marketing DSM programs, while the other is a fairly new Project Manager who has been with Edison since 2010. She puts together business case studies and energy success stories. They were interviewed separately, but their responses to various questions in the interview have been consolidated. They both work in Business to Business marketing.

3.6.1 Definition of Integrated Marketing

When asked the question, “What is your definition of “integrated marketing and outreach”? What message are you trying to get across to your customers? Answers from the two interviewees were somewhat similar:

“We want to be more than just their energy provider, we want to be their info source for all their energy needs, and provide energy management solutions. So we look at all that SCE can offer a customer, and try to bundle that together with what would resonate with that particular kind of business. That would include EE, DR and CSI, audits to help them, our call center, certainly our Business Customer Division reps, (business consultants or account reps) and bundle that for them so they can get all the information for their particular type of business at one place.”

The other interviewee said, “It’s about energy management solutions, it could be EE, or a lighting seminar, or to utilize the audit tool on-line, we want to have something for everyone.”

Both these answers refer to an eclectic version of IDSM, including not just the specific EE, DR, and DG domains, but different delivery mechanisms, such as the Internet, seminars, account reps, and/or audits.

IDSM Marketing Collateral Development

Usually, the Program Managers come to the Customer Experience Management department with a need for some type of marketing for a particular customer type. The Customer Experience Management department then decides how best to integrate that need with other DSM Program(s), which are then also brought into the process of creating the piece.

Business Segmentation

Customer Experience Management has created 12 different segments for business, which include segmenting by NAICS Codes, how the customers use energy, and what programs and services they might find useful based on that information. The segments are:

- Retail,
- Office,
- Manufacturing/Food Processing,
- Restaurant,
- Lodging/Hospitality,
- Agriculture,
- Healthcare,
- Government,
- Schools (K-12, and Universities), and
- Warehouses.

A Segment Optimization Action Plan is created for each segment, with a goal to “deliver the right message, through the preferred channel, at the right time.”²⁴ For the Office sector, this would include preferred communication channels (SCE Account Manager, Direct Mail, Email, Business Onsert & Power Bulletin, and SCE.com); Building Events (Building Owners and Managers Association, HVAC Equipment Shows); and Social Media (Facebook, YouTube and Twitter), with messaging featuring energy management solutions, customer testimonials, segment-specific messaging, energy saving tips, and so forth.

²⁴ SCE Presentation, Integrated Marketing Overview, May 2, 2012, Slide 30.

Residential Segmentation

The May 2, 2012 SCE Integrated Marketing Presentation to the IDSM Task Force described “in concept only” five “lifestyle segments” that customers will or are being segmented by:²⁵

- Comfort (“make your life easier...”),
- Saver (“make your dollars go further...”),
- Green (“living sustainably...”),
- Tech Adv (“manage energy anytime, anywhere...”), and
- Income Qualified (“receive a helping hand...”).

For example, the Green Lifestyle customer is an innovator, family oriented, younger middle age adult(s) with children living at home, engages in “green” activities, adopts technology early, is a heavy internet/TV/newspaper user, actively recycles, and tends to share household decisions.²⁶ Components of the marketing campaign to them might include: Save Power Day Incentive, My Account, Online Billing and Payment, the on-line integrated audit, Save Power Day Incentive Alerts, Conservation Tips Emails, and marketing opportunities after signup that include Energy Upgrade California and the CSI.²⁷ It is not clear from the presentation how the different customer groups will be identified; again, the slides were marked “concept only” which presumably means this lifestyle approach to segmentation is still evolving and not yet ready to be adopted or proposed.

Integrated Marketing Materials

Seven two minute videos have been placed on SCE.com and on YouTube that are aimed at the different business segments. These are changed and updated on an ongoing basis. The following were reviewed to evaluate their integrated components:

1. “*Conserving Energy without Compromising Comfort.*” This video of the Marriott Hotel includes testimonials from a Vice President and energy managers as to the EE and DR programs they participated in, and emphasizes the Technical Assistance & Technical

25 These five segments were also described in one of the marketing manager interviews, although the manager described the segments as being determined by more than just lifestyle. Her factors included demographics, use of energy, where the customers fall in Tiered pricing, whether they use AC, and whether they have swimming pools.

26 Ibid, Slide 28.

27 Ibid.

Incentive program, which installs DR enabled energy efficient equipment, as enabling their participation in Auto DR.²⁸

2. *“Water Basin Municipal Water District Puts Power into Energy Savings at Recycling Facility.”* This video opens with a description of a solar array which saves the water district 900,000 kWh per year. Pumps tests resulted in Variable Frequency Drives (VFDs) being installed. They participate in Technical Assistance & Technical Incentive, Auto DR and Savings by Design²⁹ for their new construction projects.
3. *“Suburban Water System Turns to SCE to Enhance Pump Efficiencies.”* This video includes energy managers describing the savings achieved through EE and their participation in DR; when a Critical Peak Pricing Day is called, they can automatically turn off pumps at five or six locations. The manager also mentions using “Cost Manager,” an on-line display of their daily energy usage, to track their plants’ energy costs.
4. *“Mission Foods Puts Energy Management to Work in Manufacturing Process.”* This video includes managers describing their experience with saving energy through SCE’s programs and how they curtail 800 kW on alert days via their participation in Auto DR.
5. *“SCE’s Energy Management Solutions Help Coastal Pacific Save Money Year Round.”* Discussion of occupancy sensors, their participation in Savings by Design in their new construction, VFDs, and DR participation in the CPP Program.
6. *“Auto DR Puts Railex on Energy Savings Track.”* This video showcases the company’s participation in the Savings by Design Program for a new cold storage warehouse they built to higher-than-Title 24 Standards. Through the Auto DR Program they automated reductions of 300 kW a month, saving them \$32,000 a year in peak power costs.
7. *“Chino Valley Unified School District Sets High Standards with Energy Savings.”* 18 different school sites participate in Express and Customized Solutions,³⁰ outdoor and indoor lighting retrofits, pool pumping variable frequency drives, participation in the DR CPP Program, they reduce AC as soon as kids leave school in the afternoons, and have saved about 20% of their energy costs.

²⁸ The Technical Assistance & Technical Incentive program is more fully described in the Account Executive Section.

²⁹ Savings by Design assists SCE customers to make new construction projects maximally efficient and demand responsive.

³⁰ Express Solutions is a Program that gives pre-determined incentives for installation of high-efficiency and demand responsive equipment, while the Customized Solutions Program gives incentives based on the type of solutions installed and the kilowatt-hour (kWh) saved over a 12-month period and the permanent kilowatts (kW) reduction as defined by the Database for Energy Efficiency Resources (DEER).

All of these videos are designed to be persuasive to customers that might be considering participation in one or more of SCE's programs, featuring a peer-to-peer type of testimonial. They all are integrated, full of information, and are very persuasive, emphasizing not only cost savings from the program, but also messaging environmental stewardship, leadership and "it's the right thing to do" as reasons to participate in SCE's programs. They are at <http://www.sce.com/CaseStudies/commercial.htm>. They were easy-to-find on YouTube along with many other short videos SCE produces, on safety, emergencies and educating about other matters such as the Smart Grid deployment.

A six-page 8x10 brochure "Energy Management Solutions for Your Business, Your Guide to Energy Saving Opportunities" was mentioned by one of the SCE marketing managers as an example of a well-integrated piece of marketing collateral. The cover page has photos of a farm, an office, some money in a drawer, and photos, which are also scattered throughout the piece. The second page is a general introduction to motivate the customer to learn how they can save money through EE and DR, introducing the terms and various tools and services (on-line self-assessments and on-site testing, free rate analysis, among others) to help customers begin to understand their energy consumption. The third page lists a number of specific programs and services, each described in a short paragraph, and reflecting a mixture of EE & DR, which include:

1. Get long-term savings from permanent energy reductions,
2. Express solutions,
3. Customized solutions,
4. Retro-commissioning,
5. Industry expertise,
6. Savings by Design,
7. Temporary energy reductions,
8. Price responsive programs, and
9. Reliability based programs.

The fourth page, "More Services to Help You Save," has listings for: 1) Seminars, workshops and Tours; 2) Contractor/vendor directory, which informs customers about SCE's preferred directory of lighting supply wholesalers, refrigeration specialists and whole-building consultants; 3) Shared successes, which encourages customers to visit sce.com/casestudies and to look at how other customers have benefited from SCE's programs; and 4) Manage your account online, which encourages customers to enroll in My Account and SCE EnergyManager™.

The fifth page contains five different business types and lists the three highest percentages of energy end-uses for those businesses. The segments are 1) Warehouses; 2) Convenience Food Stores; 3) Retail Spaces; 4) Restaurants; and 5) Office Buildings. The sixth and last page is mostly photos.

Overall, the piece is well-integrated with respect to EE and DR, although there was no mention of DG.

Successes and Challenges

One of the Customer Experience Management personnel felt that IDSM marketing collateral is challenged by the way it is funded. It is funded more by the DR and Customer Energy Efficiency Services (CEES) Programs, and each Program Manager wants his/her program to be featured rather than offering an integrated message across several programs. Each time an IDSM piece is initiated, there are multiple internal order numbers that they have to bill to, by percentage. In addition to the Programs, they also have to go through the normal hierarchy of reviewers that all communications collateral goes through. All collateral is reviewed by the Program Manager whose Program is mentioned, that Program's Management, Business Customer Division Sales, the Call Center, Billing, Regulatory, Legal and Communications Council. Hence, an already-layered process becomes more so with the efforts to include more than one DSM Program in a piece of collateral.

The interviewee believes that the CPUC is moving to address this problem by directing the utilities to file their next Applications with IDSM in mind. In her interpretation, this means that there will be specific budgets for Customer Experience Management to use to develop integrated marketing collateral, without having to go to the Programs for funding. Customer Experience Management would still work with the PMs to create the pieces; but it would speed up production if they had their own funding sources to work with, in this interviewee's opinion.

Both managers were very positive about an integrated approach to marketing DSM programs, and believe it results in greater energy savings beyond what might result if the programs were only marketed on an individual basis. "The holistic approach is working. You can leverage each touch point with multiple messages, rather than just a single focus. For example, this summer is forecast to be rather warm, and without the San Onofre Nuclear Generation Station (SONGS),³¹ we really need our customers to get ready for summer. We really need them to both conserve and to participate in DR programs. So we're providing them with DR information, EE tips, also looking at conservation, including some water tips. We've got a one-stop approach for summer, now's the time and this is what you need to do."

³¹ San Onofre Nuclear Generation Station was out-of-service this summer because of serious leaks of radioactive material.

Neither manager mentioned DG or DG marketing in their interviews. There are many case studies on the website, however, that feature solar and other DG-integrated projects.

3.6.2 Conclusions

- SCE's Customer Experience Management department seems to have fully embraced the integration of DSM marketing, based on the interviews conducted and the collateral reviewed.
- There was evidence of many inter-DSM collaborations and consultations in the creation and execution of the marketing campaigns and collateral.
- While much of the collateral contains two DSM domains, the value proposition for the integrated approach (i.e., how much more savings could be attained, reduction in emissions from EE/DR/DG participation on peak days, etc.) was not observed in much of the print media.

3.6.3 Recommendations

- More control over integrated collateral development should be given to marketing by way of some independent funding to Customer Experience Management.
- Marketing collateral that highlights the value proposition of customer engagement with more than one DSM area should be emphasized, not just collateral that contains two or more DSM domains.

3.7 SCE Smart Meters and IDSM

As a recent update to the Strategic Plan notes, “The development of Smart Grid technologies that enable active, real-time energy management in homes and businesses also will play a critical role in the packaging of integrated DSM services.”³² The delivery of electricity services is truly entering a new age with the advent of Smart Meters and Advance Metering Infrastructure (AMI), which enable so many new functions. Most importantly, through the provision of interval data the digital, communicating meters and infrastructure will permit even small and low-income consumers to easily participate in both EE and DR Programs. The new meters and programs will open up a whole new world of ways for consumers to become more aware of their patterns of energy consumption and the changeable nature of its cost at different times of day. Eventually, it is hoped, the meters and the programs that take advantage of the new hourly load information will lead customers to behavioral changes that will reduce energy consumption. As the market transforms, consumers will invest in new technologies and appliances that communicate with the smart meters, helping to automate their home and small business' energy management. Appliances will be able to warn consumers that their operation at a given time will be expensive.

³² California Energy Efficiency Strategic Plan, January 2011 Update, p. 67

Lighting will be dimmed for non-essential tasks at periods of peak demand through the installation of controllers and dimmable ballasts that respond to system signals. DG will also be encouraged as consumers are able to understand that a solar PV system, producing power during peak periods, would help reduce their energy bills. AMI is the key to unlocking a vastly different, and much more integrated world of energy services.

3.7.1 SCE's SmartConnect™

SCE is in the midst of rolling out its smart meter program, SmartConnect™ to residential and small commercial customers (>200 kW). The new meters will enable a variety of new functionalities:

- Wireless remote meter reading,
- Integrated Home Area Network Communications,
- Peer to Peer Self-Healing Mesh Network,
- On-Board Memory,
- Hourly and 15 minute interval recording, and
- Web Presentment each morning of the previous day's hourly energy consumption.

There are several steps to the process of installing the smart meter infrastructure. The meters are being installed district by district; approximately 4.3 million have been installed. A total of 4.2 million are logged on to the Meter Data Management System (MDMS), where they can be read remotely. Once a group of accounts has been “cut over” to operations (COTO) they begin getting billed on interval data. Approximately 2.89 million customers, or 67% of the meters, have been “cut over”. The provision of this interval data is key to participation in DR programs.

Integrated DSM Programs Enabled by AMI

When customers are cut over to operations, they are sent a communication campaign, via mail, to educate them about the new tools and applications that are available to them through the installation of the SmartConnect™ system. This material also presents opportunities to sign up for DR programs such as the Save Power Days/Peak Time Rebate (PTR) tariff, which gives customers bill credits for reducing power during events. Other DR programs that SmartConnect™ enables are the Summer Advantage Incentive (Critical Peak Pricing, or CPP), Time of Use rates (Off-Peak Savings Plan) and the Programmable Communicating Thermostat (PCT) which will enable customers to enroll in a Summer Discount Plan (AC Cycling Program).

Several Web Presentment Tools have been developed to encourage EE using the SmartConnect™ web portal. Customers can go on-line and participate in an integrated audit by enrolling in the Home Energy Advisor, (more fully described in Section 3.4.2). The Home

Energy Advisor provides recommendations for a number of EE actions they can take, EE Programs they can enroll in, and opportunities to learn more about their DR and DG options. Customers can look at their usage data for the previous day, at “*My Account*”. They can look at their hourly load, historical monthly usage and bill, the projected next bill, their current \$/kWh and Bill to Date. The “Projected Next Bill” has graphic representations of the Tiers that make up the customer’s bill, along with where the customer is at that time of the month in the Tier progression. The graphics of the Tiers presentments show the cost of each Tier in the projections of “next bill”. The graphics are particularly useful in explaining and illustrating the different tiers in the structure of California IOU’s electricity bills, which can be difficult for consumers to grasp.

Customers can sign up for “*Budget Assistant*”, a smart meter-enabled behavioral program. Budget Assistant participants set spending goals, and receive alerts via text message, emails or voice, either weekly or “only-when-over” their kWh goal budget. Theoretically, the receipt of alerts will encourage the customer to change their behavior and reduce their energy consumption. SCE plans to have energy saving tips go out with the email alerts, denoting, for example, things that can be done to reduce costs for using AC in homes and businesses. Plans to incorporate saving tips in the alerts, however, are on hold until early next year because of the re-platforming of the SCE website.

SCE started enrolling customers in *Budget Assistant* in April of 2011, and as of May 2012 has 165,000 customers enrolled. The SCE Smart Connect interviewee believed that enrollment would double this year. *Budget Assistant* enrollees are mostly residential customers; he stated that “it’s harder to get the attention of small commercial customers”.

A study that was done of the energy conservation effect of *Budget Assistant* in 2011 found a small reduction in energy usage for program participants³³. The initial energy impacts of the program are considered preliminary and may not represent future energy saving potential. During the evaluation period, relatively few customers were participating in Budget Assistant, few geographical areas were eligible to participate, and the program had been operational for only nine months. There were no SmartConnect™ DR events called in 2011 so the impact of the DR presentment tools have not yet been evaluated.³⁴

SmartConnect Integration with DG

When questioned about the opportunities for SmartConnect’s platform of programs to integrate with DG technologies, the interviewee stated that Net Metering customers see their hourly utility electric consumption on their My Account page. If the customer’s on-site generation produces

³³ 2012 Edison SmartConnect Demand Response and Energy Conservation Annual Report, Itron, April 2012, p. 1.

³⁴ Ibid

more electricity in an hour than they consume, the load shape graphs represent negative consumption or excess energy production. Many advances are being made in whole-house energy management systems that link devices and generation, enabling, for example, the building to be automated to reduce load and sell generation at periods of high prices. As these systems proliferate in the market, more applications (such as mobile platforms) that integrate a building's on-site generation with its consumption and DR for greater control, comfort and cost savings will be possible.

Customer Outreach and Communications

Customer outreach of the AMI enabled programs starts 60 days before a customer's smart meter starts communicating to Operations, starting with bill inserts. This is followed by direct mail, email campaigns and outbound calling to encourage customers to enroll in the DR programs enabled by the SmartConnect™ infrastructure and to sign up for *My Account* and *Budget Assistant*.

Home Area Network (HAN)

The SmartConnect interviewee mentioned that a small pilot is being conducted with an In-Home Display (IHD), and the manager of this initiative was contacted. The objective of the Home Area Network deployment is to enable eligible customers that have received smart meters to access near real-time data from their meter via the Home Area Network in support of EE. A second objective is to enable load control commands to be dispatched to Programmable Communicating Thermostats (PCTs) to support the attainment of load reductions during DR events. Five hundred customers have been given in-home devices and another 1,500 are planned to be deployed by the end of 2012, subject to CPUC and SCE management approval.

The Energy Information Displays (EIDs) are either displays that are about the size of a thermostat, or a "dongle", which is a USB flash drive that plugs into a customer's computer. SCE is testing a number of different aspects of the deployment. Six different phases of deployment are planned over the next few years, to evaluate different types of devices, different load control protocols and different delivery mechanisms (i.e., SCE provides, customer buys through a third party, at Best Buy, Verizon, etc.). Programmable communicating thermostats will be offered through retail outlets and almost all of the devices will have rebates, pending Commission approval, and eligibility requirements and processes.

Customers enroll on-line at SCE.com for the Programs enabled by the in-home displays, there is no phone enrollment. It is assumed that customers with energy information displays will enroll in the Save Power Day Program and that customers with programmable communicating thermostats will enroll in the Summer Discount Plan. The Home Area Network devices currently available display near real-time usage and simple text messages, such as Save Power Day events,

and daily price, cost and Tier information. They are also using an experimental design to test the behavioral effect of the real-time cost information provided by the home area network device. The experiment is providing the pricing information to a group of participants and withholding the pricing information from a control group. Evaluation of the quantity and timing of energy usage by the control and participant groups will be used to evaluate the Home Area Network experiment.

Challenges

Perhaps the greatest challenge is that the AMI initiative is occurring real-time, and at the technological forefront of the industry, where there is constant device improvement, competition and tremendous innovation. Meanwhile, the regulated environment in which the utilities operate moves very slowly and cautiously and creates significant drag on the utilities' ability to make the kind of big purchases that will lead to wide integration of communicating appliances with system signals. By the time a new technology is tested and presented to and evaluated by the regulators, it is last year's version and already obsolete.

Another issue is the fact that customers do not really want another device in their homes, according to the Home Area Network initiative manager. Will they buy the devices through a retail chain? It depends on a variety of factors. Some of these are price, ease of installation, sophistication of the DR programs the device enables (such as whether programs allow small reductions in programmable communicating thermostat temperature, or over-rides by the homeowner), the amount of comfort/discomfort the program entails, and the socio-economics of the communities in which the devices are introduced. How they are framed to fit into lifestyles and to appeal to customers' psychosocial values will also be important to adoption rates of these new devices.

The home area network initiative manager also said, "The whole market is moving to the Cloud, and to everything being accessible by cell phone." In the current deployment, the in-home display connects to the SCE website and the customers will be able to connect to that with their smart phones, pending the revamping of the website.

Other issues, beyond the scope of this report, will be associated with programmable communicating thermostats: how to incentivize these more intrusive devices, how to provision them on a daily basis, and other operational issues. In addition, there is the issue of the ratification of open communication standards for Home Area Network and appliance communications which is necessary to realize the promise of market transformation that these devices represent.

3.7.2 Conclusions

- It is still relatively early in the process of deploying AMI in SCE's service territory. The integration that will be enabled by the new infrastructure has yet to be realized.
- Early measurement has revealed a small EE effect of new on-line tools such as Budget Assistant.³⁵

3.7.3 Recommendations

- As stated elsewhere in this report, the effectiveness of new technologies in the home enabled by AMI in stimulating consumers to take more efficient actions, reduce load at peak and invest in self-generation should be carefully monitored.
- A number of opportunities for experimental design are possible as AMI-enabled appliances and applications become available, and should be explored in future research.

3.8 Energy Savings Assistance Program and IDSM

The California IOUs have been assisting low income customers with their energy expenses for decades, primarily through two programs: 1) the California Alternative Rates for Energy program gives discounts to low-income customers and 2) the Energy Savings Assistance (ESA) Program (formerly known as Low Income Energy Efficiency), which helps with the installation of energy-efficient equipment and is offered at no cost to qualifying customers. The Strategic Plan has a goal that "by 2020, 100% of eligible customers will have received all cost-effective low income energy measures."³⁶ The Research Team interviewed the Manager of the Energy Savings Assistance Program because low-income customers are a particular focus of interest of the CPUC as well as a particularly challenging sector for integration, given the preponderance of rental and multi-family housing, where opportunities for integration of EE with DR and DG may be more limited than in more affluent households.

The CPUC recently issued a Proposed Decision (PD) on Large Investor-Owned Utilities' 2012-2014 Energy Savings Assistance (ESA) and California Alternate Rates For Energy (CARE) Applications (Mailed 5/4/2012). This proposed decision both re-iterates and reaffirms the Commission's commitment to an integrated approach to delivering DSM to low income communities. Specifically with respect to Integration, the proposed decision requires that, going forward, the Energy Savings Assistance Programs must:

³⁵ Ibid.

³⁶ Strategic Plan, p. 23.

- Achieve consistency, where possible, with the Commission’s demand side programs to effectuate a cost-effective, efficient, integrated and coherent delivery of those programs.³⁷
- Continue all their ongoing integration efforts amongst the IOUs’ Energy Savings Assistance Program, California Alternative Rates for Energy Program, EE programs, DR programs, California Solar Initiative, and any other of the IOUs’ demand side programs.³⁸
- Must look to and creatively integrate, leverage, and partner with—wherever possible—countless local, State, and federal governmental and non-governmental programs and efforts directed at energy use, energy savings, energy education, and other energy-related efforts.³⁹
- “We have learned that the IOUs seem to work best when they are given guidance and directions with discretion rather than rigid prescriptive directions. Such approach should continue.”⁴⁰
- Directs that an Energy Savings Assistance Working Group (ESA Integration Working Group) be formed to develop an Energy Savings Assistance Program specific integration plan.⁴¹

SCE’s Energy Savings Assistance Program interview was conducted before this proposed decision was released, so it was not possible to ask specific questions about it during the interview. However, the interviewee mentioned the pending decision and provided it to the evaluator, subsequently. Where relevant, it will be referred to below.

3.8.1 Goals of the Program

According to the interviewee, the goals of SCE’s Energy Savings Assistance Program are to treat all income-eligible households in their service territory by 2020 and to educate low income customers as to EE opportunities, DR programs and other programs SCE offers to help them save money. The program targets customers on California Alternative Rates for Energy who have not previously participated in the Energy Savings Assistance Program. This is tracked through the Energy Management Assistance Partnership System (EMAPS), more fully discussed below. They contract out delivery of the services to community based organizations and private service providers. The program has internal kWh energy savings and kW reduction goals.

³⁷ PD, Application 11-05-017 et al, Mailed 5/04/2012, p.7

³⁸ Ibid, p.8

³⁹ Ibid.

⁴⁰ Ibid.

⁴¹ Ibid, p. 35.

3.8.2 Integration Resource and Support

The “assessors” that go out to the homes receive four days of enrollment and assessment training, which includes Energy Education training and a refresher course after a year consisting of one to three days of training. Both the initial training and the refresher course must cover a number of subjects, including all of SCE’s residential EE, DR, and DG program offerings; the eligibility requirements for the Energy Savings Assistance Program; usage of the relevant databases; screening procedures; customer privacy requirements; enrollment procedures; auditing procedures; regulatory requirements; marketing materials; and others.

The interviewee stated that the Energy Education component of the program is designed to provide approximately 20 minutes of descriptive information on IDSM options available to the customer. This component of the program informs customers about other programs and services available to help them conserve energy, reduce their peak consumption, and save money. The contractor explains that electricity costs more to produce during periods of peak demand. With the recent roll-out of the AMI meters and the SmartConnect programs, the education component has been updated to include information about SCE’s Summer Readiness education program and services now available on-line. The assessors are encouraging and helping customers enroll in My Account, SCE’s web portal that provides customers with information on their hourly electricity usage and easy access to enrollment information for several additional programs. The assessors use the My Account access to inform customers about SCE’s Budget Assistant, a notification program designed to reduce usage, and the Home Energy Advisor on-line audit tool. The assessors also inform customers about signing up for notification under the Save Power Day Incentive or PTR rate and explain the benefits associated with the Summer Discount Program, SCE’s AC cycling program. The interviewee also mentioned that he and his team meet with Program Managers of various programs throughout SCE to learn about new or changed offerings that need to be incorporated into their Energy Education component, such as when incentive levels are changed for various programs.

Sources of Resources and which DSM Options Integrated

There are about 300 assessors who are contracted with SCE to provide Energy Savings Assistance Program services. The Energy Savings Assistance Program provides them with the resources to enroll customers into the SCE program as well as Southern California Gas’ (SCG) Energy Savings Assistance Program. The contractors offer Energy Savings Assistance Program customers programs that are free to the customer, i.e., information, rates, and direct install programs. If the customer is not eligible for the free EE programs, the assessor promotes the rebate programs.

3.8.3 Internal/External Integration

In the interviewee's opinion, the programs most commonly integrated with the Energy Savings Assistance Program are the Energy Upgrade California (EUC) program⁴² and the Summer Discount Program. Their assessors also enroll customers into the SCG Energy Savings Assistance Program and Energy Upgrade California programs, as well as the federal/state Low Income Home Energy Assistance Program, which assists low-income customers with paying their utility bills. The SCE Energy Savings Assistance Program meets on an as-needed basis with the SCG Energy Savings Assistance Program to go over its program offerings. The SCE Energy Savings Assistance Program sends out daily communications to the contractors, detailing procedural changes or any particular products that are being promoted.

The SCE Energy Savings Assistance Program interviewee stated that the program also works with local government groups, particularly as complexes are identified that could have whole-complex solutions. The Program tries to bring local government groups into the early stages of the whole-complex solution process. The SCE interviewee stated that the Energy Savings Assistance Program recently participated in upgrading a Coachella Valley senior housing complex that included EE equipment and a solar installation. The upgrade went exceedingly well, in part because the Energy Savings Assistance Program worked with local government groups early in the process. The Coachella Valley project received funds from many entities: SCE, SCG, State of California, CSI, and ARRA funds. The solar permits were approved quickly because the local government agencies knew about and expected the applications.

3.8.4 Integration Successes and Challenges

One IDSM challenge identified by this interviewee is getting timely information about program changes. Because he sends out a daily update to his assessors, he has to check multiple sources to verify that all his information is correct. This is a daily time-consuming process.

Another issue, in the interviewee's opinion, is the way the assessors are incented to qualify and install EE equipment. Because they are paid by the number of customers visited, the assessors' financial motivation is to visit as many customers as possible, not necessarily to spend time educating each customer. If they shorten the Energy Education part of the visit they can move on and qualify another customer. The Energy Education part of the visit is the time in which they are delivering general energy, DR, and DG knowledge, as well as other integrated services such as access to SCE's web portals. Shortening or omitting the Energy Education component could effectively limit the integrated component of the Energy Savings Assistance Program.

⁴² Energy Upgrade California is a collaborative program administered by the California Energy Commission in partnership with public and private utilities, the California Public Utilities Commission and participating counties. The program is funded by grants and contracts from the U.S. Department of Energy, the Energy Commission, and California utility customers.

The interviewee reported that the Energy Savings Assistance Program is discussing ways of modifying the assessors' incentives. For example, some incentives could be given to the assessors if they get customers to sign up for one of the programs included in the Summer Readiness Program or SCE's web-based programs. The assessors' incentives could also be tied to the number of customers they enroll in both the Budget Assistant and Summer Discount/Save Power Days. With the proliferation of smart phones, even homes without computers can be enrolled in My Account and Budget Assistant, because of the smart phone applications that have been developed. Given that the CPUC has specifically given flexibility to the IOUs to pursue promising ideas within the CPUC's guidance and directives, as noted above, giving some additional incentives to assessors to enroll customers in the new on-line tools may be a way of strengthening the integrated components of the Energy Savings Assistance Program. On the other hand, the interviewee noted one potential conflict associated with this strategy is that providing incentives to assessors to encourage enrollment in the new behavioral and rate based programs enabled by AMI meters does not ensure that the assessors have provided the customers with the education necessary to ensure that the customers benefit from the programs. One way this issue could be addressed is by having the customer "sign" some kind of affirmative on-line statement that the assessor had explained key, specific features of the program enrolled for, such as the options to have "Budget Assistant" alerts sent either weekly or "only when over," as a part of the enrollment process. This would be similar to the CSI Program's Affirmative Statement and Signature, that the customer has been presented and understands the information. An incentive program encouraging assessors to facilitate enrollment in AMI enabled programs would require a careful review and evaluation of the program results to determine its effectiveness.

Reducing Barriers to Integration

The interviewee believes that a new tool that they are developing for energy education, which uses a tablet PC technology base, will be important to enable contractors to engage customers and to help contractors quickly develop an energy plan for an individual household based on its characteristics. The software they're building will be compatible with nearly every tablet, including the iPad. They would also like to use it to give the customer a "menu" of all of the other offerings that the customer may be eligible for, based on the customer's unique profile, and enroll them in the programs while on-site.

3.8.5 Tracking of Programs

The Energy Savings Assistance Program's performance is tracked through the Energy Management Assistance Partnership System (EMAPS). The Energy Management Assistance Partnership System is a web-based application that tracks customer program participation, as well as which houses have previously participated. It doesn't currently track customers'

participation in DR programs, but SCE has proposed it begin doing so, according to the interviewee.

3.8.6 Use of Marketing Materials

On a scale of 1 to 5, with five being the best and one being the worst, this interviewee gave a score of 4 to the integrated marketing materials that have been developed for the Energy Savings Assistance Program. He reported that they rarely offer just the Energy Savings Assistance Program materials, that they typically include other program marketing collateral to the contractors. He thinks his contractors could improve their effectiveness in enrolling customers in more than one DSM program by getting more customer engagement, perhaps through the new tablet technology or providing customers with more interactive information through one of the on-line programs. A key message for the Energy Savings Assistance Program demographic is that items offered are low or no cost, and they won't take a lot of time to install.

3.8.7 Conclusions

- With its assessor training sessions and daily communications, SCE Energy Savings Assistance Program has established a good pattern for communications and updates about IDSM opportunities. The Energy Management Assistance Partnership System (Web-based applications that track program participation) is critical components to meeting the CPUC's Strategic Plan Goal of 100% of all eligible customers receiving all cost-effective low-income energy measures.
- The PC Tablets that are being developed are important components to speed and aide enrollment of customers in programs and to enhance their knowledge of opportunities to save through enrollment in integrated programs.

3.8.8 Recommendations

- The integration component of the site visit could be strengthened by specifically incenting the assessor for customer enrollment in DR programs and/or registering customers for My Account and Budget Assistant, but this should be carefully evaluated to avoid incenting the assessors to merely enroll customers in programs rather than educating the customers as to how the programs will benefit them, and how best to use them.
- The Energy Management Assistance Partnership System (web-based applications that track customer program participation) should be expanded to include tracking of customers signing up for Summer Readiness or SCE's web-based programs.
- The PC tablet technology that is being developed should be designed to open up a number of interactive possibilities to engage and educate the customer in integrated solutions.

3.9 SCE Roadmap to Integrated Programs

Moving a technology or idea from inception to successful execution is difficult in any environment, but especially so in a large organization that is a regulated monopoly. New ideas can be destabilizing, and risky. Utilities are not rewarded for taking risks; they are rewarded for being reliable. New ideas can be “sticky”, in that they may affect lots of different parts of an organization, and not all of them to everyone’s benefit. For example, a really good idea that automates and improves employee efficiency such as the smart grid can lead to layoffs in meter readers, though jobs will be gained in other parts of the company, such as in IT and data processing, and in other industries building the tools and platforms for a new electrical grid. Multiple layers of deciders both at the utility and at the CPUC further impact the process, in that the more approvers there are the more likely it is that one of them will stop an idea from moving forward.

And yet many good ideas and technologies do make it through the approval process, in part because large smart organizations know that new ideas are their life blood. SCE’s approach to fostering and nurturing ideas from inception to testing, from ET to Pilots to testing deployment, to rollout and incentivizing in Programs, is known as the Idea Management (IM) Review. Idea management is a process for encouraging and managing the path from ETs to program measures at SCE. The goal is to ensure that a continual flow of ideas are mainstreamed into programs. The process takes concepts through planning, design and development to testing and deployment in program portfolios.

A manager of the Idea Management process was interviewed for this report, and a presentation explaining the process was reviewed.

3.9.1 The IM Process

Ideas are submitted to the Idea Management’s DSM Ideas email inbox on-line using an Idea Proposal Form. Anyone can submit an idea, including parties external to SCE. The form asks for the following information:

- An abstract that includes the type of technology/idea, the market segment it addresses, market barriers and expected outcomes.
- To briefly explain the technology and how it works; what current or past technology it replaces.
- To specify and explain technology application.
- To specify the market status of the technology, e.g., product development stage, where it is available, who is the manufacturer and where they are located.
- To explain why this is new or different idea, technology, or use of a technology.

- To explain how this will save energy.
- To identify the potential challenges and complications.⁴³

The submittal of an Idea Proposal Form initiates the process of review, selection, prioritization and feedback of and from an idea, technology, or product. The ideas then go through an Idea Clearinghouse.

Ideas that are eligible and deemed adoptable are considered for further evaluation and become part of a pipeline. Market and program-oriented prioritization and evaluation are also part of the process. The target market and size is identified. New measures are prioritized. Fit with programs and cost-effectiveness is estimated as needed. Customer Experience Management is brought in to develop messaging and positioning offerings for launch. Underutilized measures are identified and targeted for increased adoption.

The Idea Management Team (IMT) consists of subject matter experts whose members track, review, sponsor, and adopt new measures into the Programs. Representatives come from many different parts of SCE's organization:

- Design & Engineering Services,
- Customer Experience Management/Marketing,
- Business Customer Division/Account Executives/Account Reps,
- Partnerships,
- Third Parties,
- Tariff Programs & Services,
- Residential,
- Strategic Planning, and
- Energy Engineering Group.

The Idea Management Team meets monthly and they review Pipeline activities, they are updated on new Idea Proposals, and yearly projections for new Program offerings are presented. Decisions regarding the addition of new measures into the Programs are also made at these meetings. A work paper needs to be developed for Deemed measures. A "New" measure can include one that may have initially been offered via the Custom Program but is now to be offered through a Deemed delivery channel, not only a technology that has never been offered before.

⁴³ Idea Management Review, Presentation, Special Projects & Integration, May 10, 2010.

The Idea Management Oversight Committee meets quarterly. Attendees primarily provide oversight of the IMT process and monitor results versus goals. They get yearly projections of new offerings for the Programs, review process enhancements, and provide direction to the IMT's efforts. Members include mid-level and upper-level management, including a director from Business Customer Division.

The Idea Mainstreaming Council (IMC) meets semiannually: The primary focus of the Idea Mainstreaming Council is to alert a wide range of stakeholders regarding new measure roll-outs so that all of the affected parts of the organization can prepare and do integrated planning. Members include Customer Energy Efficiency and Solar (CEES), Business Customer Division, Tariff Programs & Services (TPS), Customer Experience Management/Marketing, and SCE Corporate Communications. Mid-level and upper-level management, including several directors, attend these meetings.

An example of how the Idea Management team works in practice may be illustrative. Earlier in this report the Office of the Future was described in the Emerging Technology section. The Office of the Future was itself a kind of idea management prototype in that the need for a focus on office energy usage was conceived by an individual and then brought forward and approved by SCE management as an area of research. It became part of the Emerging Technologies Programs. It grew beyond SCE, and other utilities and DOE joined the effort. It became an Office of the Future consortium, which offered to host pilot projects at different utilities to test different aspects of high efficiency office equipments' energy use and DR potential. At SCE, a number of lighting innovations were studied as part of the Office of the Future project, particularly dimmable ballasts. These also came up through the idea management process. The Office of the Future technologies or system of technologies have higher first costs, but are also responsive to system signals and therefore enable DR. Following the ET evaluation, measurement of savings and different levels of DR, these technologies were moved from ET to Programs. There, they are being incented to encourage adoption and defray the high first cost. The project manager is rightfully proud of SCE being the first utility in the country to offer incentives for dimmable ballasts. The movement of the Office of the Future from ET to Programs was facilitated by the idea management process.

As described in the ET section, it was learned in the effort to retrofit Class A offices under the Office of the Future project that it was crucial to be able to intervene at the time of turnover in order to achieve maximal efficiency in an office redesign. Once it was understood that retrofitting at the time of turnover was key to achieving the savings associated with Office of the Future, the idea of getting leasing agents and building owners engaged in the process was conceived and the idea went into the idea management process. That led to the development of an RFP aimed at contracting with leasing agents. The winning agent organization will work with building owners to encourage new tenants to sign contracts that would bring their new offices up

to greater-than-Title 24 standards. An RFP is being released by the Sustainable Communities Pilot to this effect. These examples show the idea management process working to shepherd good ideas through the SCE organization to the energy marketplace.

The idea management team is enhancing a detailed tracking system and dashboard for its reporting, which will be further described in the next section of this report.

3.9.2 Conclusions

- The idea management process is a comprehensive and eclectic process for moving technologies and practices from the ideation to the realization stage in Programs.
- It appears to track a number of important variables affecting measures across many different parts of the organization, and to thus be well-integrated internally within SCE. The degree the idea management program tracks the deployment of measures into integrated projects was not explored in this round of IDSM research.

3.9.3 Recommendations

- The deployment of measures, technologies and practices emerging from the IM process into integrated projects should be tracked.
- Examples of the success of the idea management process, particularly in achieving integrated projects such as the Office of the Future and dimmable ballasts, should be widely disseminated throughout and beyond the SCE organization.

3.10 SCE Reporting and Tracking

In a regulated business, reporting and tracking processes are vital to the organization's success; unlike unregulated companies whose success is measured against "the competition," a utility must demonstrate its competence to its regulators in order to be given a rate of return sufficient for it to continue to provide services and make a profit for its shareholders. Elaborate tracking and reporting rules have been developed for regulated energy public utilities, for such purposes as equity and capital market assessments, public safety, and ratepayer protection against abuse. Even more elaborate processes have been created to track EE, DR, and DG programs, which are dispersing huge amounts of ratepayer funds to incent the installation of highly efficient, responsive and distributed generation equipment. The present study adds yet another layer of elaboration to the IOUs' tracking and reporting challenge, asking the question, "how well are the IOUs doing in achieving the CPUC's vision to install more integrated DSM projects, that is, projects that include two of the three DSM domains. Is SCE tracking the installation of integrated projects?"

To answer those questions and place them in context, this section will review the seven interviews with Account Executives (AEs) and two reports: 1) The 2004 National Energy Efficiency Best Practices Study; and 2) Program Assessments Core Calculated Report, a current study of the California IOUs' nonresidential programs, which also looks at best practices and updates the earlier list.

The 2004 "National Energy Efficiency Best Practices Study"⁴⁴ is a study of 10 non-residential large comprehensive incentive programs nationwide. Best practices are grouped into eight categories, one of which is Reporting and Tracking. The Reporting and Tracking Best Practices are:

- Integrate all program data, including measure-level data, into a single database,
- Integrate or link with other appropriate systems such as cross-program databases, customer information systems (CIS) and marketing or customer relationship management (CRM) systems,
- Use automated or otherwise regularly scheduled notification to achieve close monitoring and management of project progress,
- Utilize electronic workflow management and web-based communications,
- For programs with proactive marketing efforts, track program prospects early and drive program intervention around major equipment-related events, and
- Balance the level of tracking against resource availability.

The second report, The Program Assessments Core Calculated Report, characterizes the current practices of the California IOUs' Calculated (non-residential) programs, while also modifying and updating a set of best practices.⁴⁵ The report highlights a SAP⁴⁶-driven enterprise system that SCE transitioned to less than a year ago, noting that it enables several features of integration as follows.

- **Horizontal Systems Integration.** This type of tracking involves integration across all the systems that track IOU Programs, including program/project, (which may include separate databases for tracking projects and tracking program performance); customer; and invoicing systems. The program/project databases are those that keep the project details, calculations, savings totals, measure types etc. and often include applicant information that is redundant to the customer tracking systems. The customer database,

⁴⁴ Non-Residential Large Comprehensive Incentive Programs Best Practices Report, Quantum Consulting, Inc., Mike Rufo, Study Prime Contractor Lead, December 2004.

⁴⁵ Program Assessments Core Calculated Report, Itron & ERS, Draft, June 2012.

⁴⁶ SAP is a German multinational software corporation that makes enterprise software to manage business operations and customer relations.

Customer Relationship Management in SCE's case, houses customer contact and billing information. Invoicing systems are systems for accounts payable and receivables, and include payments for incentives for customers and payments to contracts that support programs.⁴⁷

- **Vertical Systems Integration.** This is where the system integrates upstream and downstream partners and stakeholders, including customers, account executives, Third Parties, evaluators and the CPUC. Application processing, lead tracking and generation and pipeline activities are upstream activities. According to this report, application processing is still handled by hand at all the CA IOUs, even SCE, entering information from an application that a customer, account executive, Vendor, or 3P has filled out. This can lead to data entry error and creates extra administrative work. It also delays the processing of applications. SCE is trying to automate this process, via a web-based application that automatically enters into the database.⁴⁸ Other upstream integration enables pre-application data to be entered, which could allow third-party program projections to be integrated earlier in the process, since they are often developing savings well before applications are submitted. Downstream integration capabilities can support customer and stakeholder satisfaction by automatically alerting customers, account executives, and others as to the status of projects moving through the process, which can help expedite the process. Other downstream integrated capabilities include evaluation and regulatory filings, where SCE could automate the filings of its monthly and quarterly reports. Downstream integration could also enable and speed the provision of information to evaluators, who presently must go through a time-consuming and expensive data request process that often results in data being provided so late in an evaluation that it may no longer be relevant.
- **Up-to-Date and Comprehensive Data.** Propagating data through these large organizations is a problem if integrated systems are not in place. According to the Program Assessments report, SCE initially had a large and heavy uplift to bring all the customer data up-to-date, but now that it is done all changes moving forward propagate instantly and in real-time.⁴⁹

The Program Assessments Report also notes, specifically with respect to SCE, “the organization is still in transition to this new system—organizational culture and processes always adapt more slowly to a changing system than the system itself—which means that many of the benefits have yet to be captured.”⁵⁰ There are at least two representations of the truth of this statement which are present in this IDSM study. As noted in Section 2 above, many of SCE's account executives

⁴⁷ Ibid, p. 65.

⁴⁸ Ibid, p.66

⁴⁹ Ibid.

⁵⁰ Ibid, p. 65.

were highly critical of the new system, particularly the longer-term employees. They do not yet see its value. But the system has been in place for less than a year. If the system starts showing its potential benefits, for example by producing more timely alerts to the account executive's on the status of an application, it is likely that it will gain wide appreciation within the organization. If the system is able to link up with external actors, like Third Parties, ED staff and evaluators, who will be able to get measure, project and program data more easily it will gain the appreciate beyond SCE.

According to SCE's 2011 Smart Grid Plan,

“The CSBU Customer Data Warehouse will be responsible for storing and managing vast amounts of customer data, *including interval usage data*. This transactional data forms the basis for SCE's meter to cash process, and also provides data for web presentment tools and call center use. A primary purpose of the Customer Relationship Management system is to manage, track, and report the company's Demand Side Management (DSM) programs, including EE and DR. The Customer Relationship Management also integrates with other customer systems such as SCE.com, Alerts and Notifications System, and Customer Data Warehouse.”⁵¹

This description implies that the Customer Relationship Management system is capable of tracking and reporting the amount of EE and DR at each site. But whether the system is able to identify sites that signed up for DR but did not get any automation equipment is not known at time of writing, Also not known is whether it tracks sequential enrollment of a site into EE, DR, and DG, and how far back it goes. There is no mention of DG in the description and it is also not known at time of writing whether the system tracks DG. The account executives reported that there was no field in the Customer Relationship Management data entry that would allow them to indicate that a site was enrolled in more than one DSM Program.

The SAP-driven enterprise management system that SCE has invested in was, according to the Program Assessments report, “very promising, embodying much of what the ideal system should include.”⁵² Though all the California IOUs are moving in this direction, SCE is the only one that has undertaken the massive effort to integrate all its systems.

3.10.1 Tracking of the Idea Management Review

The current MS Access-based idea management database is being migrated and enhanced in an MS SQL Server based system to further expand the Idea Management process described in Section 3.9. This will allow SCE to better track the uptake of new technologies via program

⁵¹ SCE, Smart Grid Plan, 2011, p.78; emphasis added.

⁵² Ibid.

participation in EE and DR. It is unclear, at time of writing, how much DG tracking is occurring, if any. Although the idea management database does not appear at present to call out integrated projects separately, as a separate report, it appears that this could be done, at least for EE and DR measures as they move through the process. The idea management database includes Quarterly summaries of activities, new measure adoptions by sector, gross savings to date, and recommendation summaries. The idea management database will pull information from the Design and Engineering Services Database, the Energy Engineering Group Database, and the Regulatory Database and/or Customer Relationship Management. The idea management database output goes to the CPUC's ED, which needs to approve deemed measures before they are offered in Programs if a workpaper is required. The measures are prioritized by 1) identifying target markets; 2) estimating market size; and 3) prioritizing adoptable new measures (fit with programs, cost-effectiveness, messaging and positioning offerings for launch, and broad management oversight). Identifying and targeting underutilized measures for increased adoption may also be addressed.

The Idea Management Dashboard is a set of graphics that track a number of different aspects of the IMT process of measure proliferation and adoption. SCE presents New Measure Adoptions over time and the top New Measures, giving results by Four Year Energy Savings and by Demand Reduction. SCE has also presented Four Year Energy Savings and Demand Reduction forecasts for Top "In Pipeline" Measures.

The data available to the idea management process show that SCE is integrating across a wide variety of databases. While the fundamental data issues of designing and training of personnel on how to use the systems are still in process, tracking of integrated projects through this system is a logical next step.

3.10.2 Tracking of Marketing Collateral

One of the marketing managers interviewed mentioned that that they were not capturing whether and how their integrated collateral was being used except for some things like the integrated on-line audit tool, which could be measured by numbers of hits and downloads. She commented, "The reps don't go into the system and say if they've used the materials and Customer Relationship Management is not set up to record it". The new SAP-driven management enterprise system should be tracking at least the number of hits the integrated audit tool is getting.

3.10.3 Conclusion

SCE's new enterprise management system promises to deliver very impressive and integrated capabilities.

3.10.4 Recommendations

Training for the account executives on how to access key data in the system, such as status of projects:

- Creation and generation of reports for integrated projects combining EE with DR or DG, including some kind of time dimension to allow review of change in frequency of integrated projects over time.
- Creation and generation of reports showing, by Business Customer Division segment, which types of customers participate in integrated projects.
- Inclusion in the Incentive Application of a field for entry, a question to the effect of “is this project combining EE with DR and/or DG?”
- Tracking of account executives’ success in achieving integrated projects.
- Tracking of the improvement in the speed of Application processing that the new system should achieve, and broad communication of that improvement throughout Business Customer Division.
- Tracking of the number of customers accessing the on-line integrated audit tool, and other attributes of its effectiveness, such as number of actions the customer claims to have taken in response. (When the customer’s actual energy usage becomes available, a number of other impacts could obviously be measured, such as the impact of the tool on actual demand and consumption, the most-effective and most frequently-implemented recommendations, and other indicators of the efficacy of the tool.)

3.10.5 SCE Best Practices

- Creation of the California Advanced Lighting Training Control Program, because SCE found that contractors were installing control equipment incorrectly.
- Inclusion of controllable ballasts in the next update to Title 24 Building Standards (2014), so that all new ballasts installed in California will be controllable.
- Providing incentives for dimmable ballasts between now and 2014, to stimulate commercial and industrial customers to install them before the new standards go into effect.
- Adopting and promoting a “systems approach” to office design, achieving greater actual savings and demand impacts than a measure-by-measure approach would have predicted.
- Investing in an enterprise system that allows integration of multiple data fields, and that should allow much better tracking of not just integrated projects, but their cost, time to install, involved personnel, and many other important tracking variables.

3.10.6 Recommendations for the CPUC

- ***Sustainable Communities Pilot:*** There should be a consistent reservation period between new construction EE and CSI reservation periods in order to incent builders to design new buildings with both solar and maximal efficiency equipment.
- ***Sustainable Communities Pilot:*** Solar thermal should be included in technologies that qualify for ZNE construction, since hot water produced during peak periods is valuable.
- ***Organizational:*** The CPUC could ask its own staff to model integrated behavior for the IOUs by establishing inter-DSM protocols for meeting guidelines and coordination between EE, DR and CSI/SGIP staff.
- ***Incenting Integrated Approaches:*** Since the CPUC is using a measure-by-measure approach to estimate impacts, and the Account Reps have kWh and kW goals to meet, more EE and DR could be accomplished if some way of measuring and incenting an integrated systems approach to building retrofits was created, either by before and after performance measurement or by some other means.

4

San Diego Gas & Electric

4.1 Knowledge Enhancement/Training

In the past, DSM options to save energy have been presented to customers based on a single-program approach by the California IOUs. EE, DR, and DG programs were often presented separately and overlapping information about the programs or the benefits of participating in programs across DSM options was not emphasized. This approach required interested customers to seek out information for different programs, a cumbersome undertaking that may have required customers to interact with numerous contacts at their utilities. To minimize this burden and to maximize energy savings for customers, the CPUC's Energy Efficiency Long Term Strategic Plan has directed the IOUs to integrate their EE, DR, advanced metering, and DG programs.

As part of this move towards integrated DSM, it is vital that the staff of the IOUs are not only knowledgeable about the concept but also that they can put it into practice when they offer solutions to their customers. This section of the report focuses upon the existing understanding of the IDSM concept for interviewed employees at SDG&E and on the types of workshops and training sessions that were held there to further expose employees to how IDSM options can be presented to customers.

Overall, IDSM knowledge and training at SDG&E encompasses EE, DR, and DG, though less emphasis has been placed on the role of AMI in the training sessions.

4.1.1 SDG&E Interviewee Definitions of IDSM

In order to assess IOU staff knowledge regarding IDSM, the research team asked each interviewee to describe their understanding of what IDSM means. Definitions varied across those interviewed, but generally speaking, they all noted that IDSM consists of comprehensive customer solutions that integrate EE and DR options. Most interviewees also mentioned that any integrated solution should include DG. Other elements included in the definition of IDSM were the incorporation of the advanced metering infrastructure (AMI) and home area networks (HAN), minimizing greenhouse gas (GHG) emissions, energy conservation, sustainability, and energy rates.

Some of the responses received when interviewees were asked what IDSM means to them are as follows:

“It provides a total package of solutions to customers. We used to talk about one program (at a time). Now we understand the customer’s view and present a set of solutions that includes EE, DR, and DG as much as we have it.”

“It includes EE, DR, and co-generation. Those three elements and being able to talk about all of those issues on the customer side and attempt to help them reduce energy usage and their costs.”

“It is a bundling of our offerings to our customers to conserve or save energy, demand, and to integrate various program elements. The most important, based on loading order, are EE, DR, and renewable technologies. These should be integrated together and offered to customers in a comprehensive manner.”

“It is providing the customers an opportunity through DR to respond to price signals along with the EE programs offered. We try to offer these so they come through one channel.”

“It is a comprehensive view of customers where they look at rates, energy efficiency, demand response, all customer offerings including DG, solar, and try to figure out what is the best overall mix for the customer. Though solar is not managed by the California Center for Sustainable Energy, it is important to partner with them to include it as part of the offerings available to customers.”

Based on the above definitions provided by the interviewees, it is clear that they believe that IDSM is a bundled solution to saving energy that includes EE, DR, and DG.

4.1.2 Workshops and Training

The evaluation team sent a data request to SDG&E asking for information about any workshops and/or training sessions that have been held for its employees on the subject of IDSM. In response, SDG&E stated that it held a three-hour IDSM training on October 27, 2011 for program management and implementation staff. A make-up training session was held soon after on November 8, 2011. The presentation, made by Elizabeth Lowe of Barakat Consulting, was designed to teach attendees about the CPUC directives related to IDSM and the efforts taken by SDG&E to integrate the DSM options available for its customers. In addition, the training session presented success stories in the field. According to the response to the data request, this course was a required activity.

The objectives of the course were listed as follows:

- Describe the purpose of integration, the reasons for it, and the bottom line benefits,

- Understand the regulatory view of integration, integration requirements and delivery methods,
- List the kinds of demand side management programs that are required to be integrated, and
- Understand how to facilitate the delivery of integrated offerings to customer.

Based on the training presentation, IDSM has many definitions, depending on what it is referring to. IDSM can refer to an integrated organizational structure of the IOU, an effort to create an integrated application, integrated marketing which packages energy savings solutions into a single marketing brochure, or an integrated program delivery structure which presents customers with the various programs across DSM options that they can use to maximize their energy savings.

The training presentation described the challenge faced by the IOUs regarding the “siloed” nature of the various DSM options and how the IOUs are set up so that each has separate budgets for implementation and marketing, separate regulatory proceedings with different timelines, and separate teams who are responsible for the management and implementation of these programs. With such a complex structure, customers must interact with numerous points of contact if they want to find an optimal energy savings strategy.

Much of the presentation focuses on how IDSM should be used to “simplify the existing programs into fewer, clearer and more coordinated programs that customers can more easily access and understand...Ultimately IDSM should be about aligning rate options, EE, DR and DG programs with customer wants and needs.”¹ It describes the strategies for IDSM that were laid out in the Strategic Plan, describes the role of the Statewide IDSM Task Force, and presents the eight directives that have been laid out by the CPUC to lead the IOUs towards IDSM.

A sizable portion of the presentation includes slides that describe IDSM metrics, which are to be tracked during the 2010–2012 program cycle and reported once the period is over. The metrics are focused upon integrated audits, integrated efforts and organization, and integrated awareness. With regard to integrated audits, the IOUs will be required to develop and make available to residential and non-residential customers integrated audits or surveys (both online and on-site). The IOUs are to track the integrated audits that are completed as well as who completes these audits. The evaluation team recommends that SDG&E should track is whether the integrated audits are leading to program participation based on the recommendations made.

¹ SDG&E Integrated Demand Side Management Kick-Off Meeting. PowerPoint presentation made by Elizabeth Lowe of Barakat Consulting on October 27, 2011.

With regard to integrated efforts, SDG&E is to develop and provide status reports that identify how well it has been integrating DSM options including lessons learned, best practices, and improvement plans. The purpose of these status updates is to describe the internal and external frameworks that have been put in place to support IDSM programs and technologies. The IDSM Task Force has carried out this effort by developing joint CA IOU quarterly reports since the beginning of this program cycle. Last, the IOUs will report on the awareness and knowledge of relevant staff, such as program managers, account executives, marketing staff, emerging technologies staff and others. This will be completed through trainings, such as the one at which this concept was discussed, as well as through surveys that show what staff has retained and learned.

The remainder of the presentation described the various IDSM efforts being carried out at SDG&E including integrated pilots, integrated emerging technologies, integrated audits, integrated marketing, and integrated training sessions. It also presented success stories of IDSM carried out by Sempra customers, such as Harrah's Casino in Rincon, University of San Diego, and the Genomics Institute of the Novartis Research Foundation. Each of these cases was presented and included a description of how different EE, DR, and/or DG programs were used in concert to enhance these customers' achievable energy savings.

According to one interviewee, the training included group exercises where various individuals came together to talk about how to integrate DSM from a program delivery point of view and from an education and outreach point of view.

4.1.3 Training Feedback Survey

The evaluation team learned that SDG&E surveyed its training attendees to get an understanding of who attended the training and what concepts they took from the presentation they attended. A data request was sent to SDG&E and in response, the evaluation team received a presentation of the survey findings. SDG&E relied upon this survey and the findings as one of the metrics of the IDSM initiative. In addition to assessing the awareness of IDSM amongst SDG&E staff, the survey was also used to identify the barriers to IDSM the surveyors believe exist and how they can be overcome.

A total of 122 participants completed surveys. Close to 70% of the training participants who completed surveys have been employed by SDG&E less than five years, while a total of 10% have been with the organization over 10 years. Most of the attendees work with EE programs (over 60%), but attendees who work with DR, residential, non-residential, new construction, low income, and other programs were also present. Based on the survey results, 92% of the participants agreed that they understand the CPUC requirements for IOUs to integrate their DSM program offerings to customers and 85% listed at least two of four programs required for integration (EE, DR, DG, and Low Income). What is interesting is that IDSM includes more

than just these four options. Given this finding, it seems that SDG&E staff needs a more thorough understanding of how IDSM can also include GHG reduction strategies, water efficiency, advanced metering, and resource conservation.

Almost all attendees who were surveyed (96%) correctly identified all the benefits of integration, which were listed as:

- Improved coordination on the regulatory and program front,
- Better leveraging of marketing campaigns,
- Better alignment of programs with customer needs, and
- Improved efficiencies and potential for reduced cost of marketing and delivery.

The most interesting survey findings were that 71% of attendees stated that they already coordinate with other programs to integrate offerings, while 93% believe there are barriers to integrating effectively. The top barriers that were listed include internal silos/communication (61%), budgets and funding (54%), and CPUC/regulatory policy (35%). About half of the surveyed attendees felt that they have adequate tools and resources to deliver integrated offerings to customers (53%) while just fewer than 40% felt they did not.

The top tools that attendees felt would be most useful to deliver integrated DSM offerings, in ranked order, included integrated database tracking, cross promotional data/cross training for employees, training materials and web tools, searchable success stories, and fact sheets on who works on what programs. This process evaluation is looking to determine if the IOUs are starting to implement these suggestions and if so, whether they are helping to lead to successful implementation of IDSM.

4.1.4 SDG&E Staff Impressions on Training

Many of the staff members who were interviewed were asked whether they attended training and if so, what sort of guidance they were given to help them implement the concepts they learned. They were also asked if they themselves have assisted with trainings or made presentations to smaller groups to inform others they work with about IDSM. Of the interviewees who were asked whether they attended SDG&E's IDSM training, most stated that they did. Their general impressions were that the information presented was useful, worth their time, and that it was an effective way to make sure everyone had a common understanding of IDSM. One interviewee said that the training "broadened his knowledge about what he can offer to his customers." Another said that the training was successful in building her knowledge of IDSM. After the training, virtually all participants who were surveyed stated that they understood how programs or projects could contribute to integrated solutions for customers.

A few of the interviewees felt that the training was at a high level and that it needed to go deeper to truly provide them with an understanding of how to integrate programs across DSM domains. One interviewee stated that the training was a little bit of “checking the box” in terms of requirements and that it did not have enough “meat on the bones”. There are plans to conduct future trainings and some of the employees felt it would be very important to go more in depth. In addition, a few employees also mentioned that the training would have been more relevant to their work had it been held earlier. The program cycle began in 2010, yet the training was not held until the end of the 2011 year.

4.1.5 Conclusions

- From a thorough review of the data, training presentation slides, marketing materials provided to the evaluation team and the notes taken during interviews, it is clear that SDG&E staff has a good understanding of what IDSM entails. Definitions of IDSM varied across interviewed SDG&E staff, but generally speaking, they all noted that IDSM consists of comprehensive customer solutions that integrate EE and DR options. Most interviewees also mentioned that any integrated solution should include DG.
- A survey was conducted after the IDSM training took place to assess the awareness of IDSM amongst SDG&E staff and to identify the barriers to IDSM the surveyors believe exist. According to the results, 92% of the participants agreed that they understand the CPUC requirements for IOUs to integrate their DSM program offerings and 85% listed at least two of four programs required for integration (EE, DR, DG, and Low Income). The top barriers that were listed include internal silos/communication (61%), budgets and funding (54%), and CPUC/regulatory policy (35%).
- A few of the interviewees felt that the training was at a high level and that it needed to go deeper to truly provide them with an understanding of how to integrate programs across DSM domains.

4.1.6 Recommendations

- Continue to hold refresher training courses for SDG&E employees to make sure they fully understand what IDSM entails, not just how it is defined. Emphasize that though SDG&E does not implement DG programs, it does have a major role in IDSM options that customers should consider. Additional training with concrete examples of integration will provide staff with a deeper understanding of IDSM.
- SDG&E staff listed internal silos/communication and budgets and funding as the top barriers to IDSM. Based on the findings from this study, the evaluation team agrees that these barriers exist and need to be overcome. SDG&E’s recent reorganization is a good attempt to help break down the existing silos between DSM programs and staff. Another way to encourage communication is to hold quarterly meetings to discuss staff successes and setbacks with IDSM. The barrier regarding budgets and funding also needs to be

addressed. If the difficulties stem from the regulatory policy established by the CPUC, a change needs to come down that allows SDG&E and the other CA IOUs to use funds for IDSM initiatives.

4.2 Integrated Pilots

The implementation of integrated pilot programs is one of the strategies described in the California Long Term Energy Efficiency Strategic Plan to pursue IDSM. As part of their 2010-2012 portfolios, the IOUs were instructed to consider the development of pilot programs to inform future policy and program submissions regarding integration best practices, offer bundled products that include elements of EE, consumer generation, DR, and the best available AMI technology, and offer different forms of delivery (including third party and local government platforms) and information access. The 2010-2012 Implementation Goals states the following: “Propose and launch program delivery pilots testing capabilities and effectiveness in the marketplace, including: EE, DR, AMI, and DG.”

According to the IDSM Task Force Quarterly Report (Q4 2011), SDG&E has two major pilot programs that are considered integrated. These are the Local Island (LI) Pilot Program and the Local Sustainable Communities (SC) Pilot Program. An additional pilot, the Erma Road project, is listed but according to the tracking report, it is under consideration to be classified as an integrated pilot. The research team learned of an additional pilot that was not included on the list of integrated pilots in the IDSM Task Force Quarterly Report (Q4 2011), but based on its description, it believes the program fits the definition of an integrated pilot and merits discussion in this section of the process evaluation. This is the Home Area Network (HAN) Pilot Program. Interviews with the program managers of these pilots were conducted in order to determine the purpose of the pilots, how far each pilot program has progressed, whether or not the PMs were provided with any guidance or directives to integrate across DSM options, which DSM options are integrated in the offerings to customers, and most importantly, assess whether the pilots have integrated DSM options in the program implementation stage.

Generally speaking, the Local Island Pilot encompasses EE, DR, and DG. Advanced Metering Infrastructure (AMI) has not been featured as prominently in this integrated pilot.

The Local Sustainable Communities Pilot is encompassing EE, DR, and DG. Construction of the sustainable community is still in progress so AMI has not played a significant role to date.

The Home Area Network pilot encompasses EE, DR, and advanced metering infrastructure/home area network technologies. DG was not featured in this pilot.

4.2.1 Local Island Pilot Program – SDGE3137

General Description

From its inception, the Local Island Pilot Program was designed to leverage EE, DR, and DG programs to allow customers to pursue integrated whole house/building solutions in a geographically targeted area (Borrego Springs, California).² As stated in the Local Island Pilot Program Implementation Plan (PIP), SDG&E will implement “all cost effective EE measures within the locus of customers served by the selected substation, cutting across the Low Income, Residential, and Non-Residential sectors. In addition to energy efficiency (EE), there will be significant activity to increase penetration of our demand response (DR) programs, as well as supporting the placement of renewable sources of power and clean, efficient distributed generation.” This program brings together integrated program offerings and was explicitly designed in accordance with the California Long Term Energy Efficiency Plan, the Energy Action Plan (EAP), the California Solar Initiative (CSI), the Advanced Metering Infrastructure (AMI), and the California Clean Generation Program. SDG&E has used this pilot as a ‘proving ground’ to show that customers can use a variety of demand-side options simultaneously to reduce energy usage and help them conserve in order to achieve deep energy savings. The Local Island Pilot provides IDSM solutions to both residential and non-residential customers, as described below.

Residential Focus

Through this program, residential customers of Borrego Springs receive free comprehensive home energy audits from a third-party vendor in order to determine appropriate EE improvements and DR controls/upgrades, as well as the self-generation projects that the customer could consider. Upon the completion of the audit, the auditor sits down with the customer and makes recommendations about the various solutions available to reduce, conserve, and generate energy. The recommendations entail single-family and multi-family EE and DR home improvement packages that drive participants to, or at least towards, Zero Net Energy (ZNE).³ The solutions include EE and DR programs offered by SDG&E as well as co-generation solutions from the California Center for Sustainable Energy (CCSE). The customer is also provided with a checklist of recommendations and energy savings tips to address behavioral changes that can reduce energy usage. In addition to the programs offered by SDG&E and the California Center for Sustainable Energy, the auditor also presents state and federal opportunities

² Borrego Springs, CA is located in the desert in San Diego County and is in the desert. The average temperature in the summer months is often greater than 100 degrees Fahrenheit, which makes it a prime location for the installation of solar panels.

³ For this pilot, Zero Net Energy is defined as the average of the site’s gas and electric energy savings compared to the previous year’s usage.

that could be layered on top of SDG&E's program offerings. Once recommendations are made the customer decides on the solutions that are best for them.

The monetary incentives and direct install measures offered by SDG&E are based upon the set of measures and/or controls selected by the customer. There are three levels of incentives available depending on the solutions adopted by the customer. The incentive structure is designed to motivate customers to choose higher tiered bundles of measures/controls.

- At 10% ZNE achieved, the customer will receive \$1,000 that will be applied towards additional qualified measures listed on the audit report.
- At 20% ZNE achieved, the bonus incentive increases to \$2,000.
- At 50% ZNE achieved, the incentive increases again to \$5,000.

In all cases, the bonus incentive may only be applied toward qualified audit measures.⁴

Non-Residential Focus

The program operates very similarly for residential and non-residential customers. Eligible non-residential customers receive free comprehensive audits with recommendations of EE, DR, and self-generation products and services using SDG&E's Continuous Energy Improvement (CEI) approach. Customers are provided with line-item reports of recommendations regardless of whether an incentive is available through SDG&E. The report serves as a roadmap to, or at least towards, ZNE, much in the same way the audit reports are developed for residential customers. The program provides customers with information about federal and state tax credits and programs related to energy and greenhouse gas measurements and tracking, thereby encompassing the plethora of IDSM options that are incorporated into this pilot.

Financial incentives are available to non-residential customers who adopt rebated measures through SDG&E's statewide deemed programs. In addition, customers can receive "bonus" incentives based on their progress toward ZNE. These bonus incentives are in the same amounts as those available to residential customers when they adopt bundles of measures/controls through the pilot. Like the residential customers, non-residential customers must also participate in a DR program to be eligible for the bonus incentives. For the highest level of incentive achievable, customers must demonstrate a commitment to install a photovoltaic solar system with a

⁴ The incentive structure presented for residential customers differs from what was presented in the Program Implementation Plan for the Local Island Pilot. This change was made based on feedback received from SDG&E.

minimum of 2 kW power production and install an advanced lighting system.⁵ The fully bundled offering for non-residential customers includes a comprehensive audit that focuses upon emerging technologies, participation in DR, energy planning services, and encouragement to enroll in On-Bill Financing and CSI.

Marketing and Outreach

The Local Island Pilot Program is based on direct outreach and interaction with residential customers occurs on a one-on-one basis. As described by the program manager, third-party auditors went directly to customers to offer free comprehensive energy audits based on a screening of residential customers by SDG&E. The screening effort identified potential residential customers in different customer segments such as multi-family, single family, and mobile homes. The program went to single family customers who were the top energy users and worked down to 50% to 65% of the accounts in the Borrego Springs area. Focusing on larger energy users was found to be a successful strategy. According to the interviewee, the program had a high penetration rate for audits and the installation of energy-efficient measures. Many customers in Borrego Springs, however, already had solar panels so the increase in co-generation stemming directly from this pilot was not as sizable as the impact attributable to the installation of energy efficient measures.

Several types of marketing collateral were developed for this pilot and used to inform residential customers in Borrego Springs of the benefits of the program. No collateral directed towards non-residential customers was provided in response the research team's request for data. Postcards, fact sheets, and brochures refer to the pilot as the Borrego Springs Energy Efficiency Program, which provides eligible customers with a free in-home energy assessment, a suite of optional direct install EE measures to be installed by the third party implementer, and up to \$5,000 in monetary incentives for installing energy efficient upgrades. It is notable that none of the materials mention the requirement to participate in a DR program.

Budget and Spending

The Local Island Pilot Program began in the early spring of 2011 and is expected to be completed by the end of June 2012. According to SDG&E's April 2012 Energy Efficiency monthly report, the budget for this program for the 2010–2012 program cycle is \$2,458,480 and expenditures to date are \$956,217. Based on the expenditures, the program has spent approximately 39% of its budget. Given that the program is ending, there is no concern that the program will go over budget. The program manager noted that the program expenditures on the

⁵ The PIP states that all customers must demonstrate a commitment to install a photovoltaic solar system with a minimum capacity of 2 kW power production. Clarification provided by SDG&E stated that this was not the case for residential customers. No clarification was provided about this stipulation for nonresidential customers.

direct installation of measures came in below budget, thereby making these measures a cost-effective way to achieve energy savings.

Successes and Setbacks

When asked about the successes of this integrated pilot, the interviewee noted that much of it came from having a single point of contact with the customer for all the energy solutions available, whether it is related to EE, DR, or DG. By presenting a comprehensive package of energy solutions, the customer develops a level of trust with the auditor. Customers feel that they can go to one source for all information about various ways to save energy. The pilot was implemented in such a way that the auditors had all of the application materials with them and they assisted the customer with the process of filling out the applications. The interviewee stated that follow-up after the completion of the audit has also been key to the program's success, increasing the rate of program participation. SDG&E positioned third-party auditors to implement the program in Borrego Springs by guiding customers through the integration of programs. The vendor has been well received by the community and they have a high aggregate participation rate.

One major setback was noted by the program manager. When the program was initially rolled out, only one DR program (SDG&E's Air Conditioning Cycling program) was available to the customers in Borrego Springs and during the course of the pilot's operation, the DR program had to be discontinued due to technical issues. Since then however, SDG&E has been able to offer its customers with the Peak Time Rebate DR program.

In addition, a high concentration of solar panels had already been installed by customers prior to their participation in the program. As a result, most of the energy savings that came out of this program resulted from the installation of EE measures, as opposed to co-generation of electricity or participation in DR programs. This does not mean that customers are not engaging in IDSM energy solutions but rather that the savings attributable to this program are from EE measures.

Local Sustainable Communities Pilot Program – SDGE3138

General Description

The PIP for the Local Sustainable Communities (SC) Pilot describes it as a flagship program because its design enables market transformation “resulting in measurable EE, integrated DR, DG, renewable, and natural resource savings while optimizing long term ecological, social and economic health of California.” The pilot seeks to incorporate IDSM along with smart growth concepts in order to develop an environmentally conscious and sustainable community that minimizes its carbon footprint. This pilot has also been designed to provide a path to meet California's long-term EE goals, including the pursuit of zero net energy homes for a certain

percentage of residential new construction by 2020. “Incentives and other assistance are available to developers, building owners, and design teams that construct highly energy-efficient buildings with sustainable design, and long-term energy-efficiency....This holistic approach to program design and implementation is coupled with a new management model and evolutionary improvements in energy, water and air quality savings over the project life.”

Initially, SDG&E faced difficulties finding a developer for this pilot program. These difficulties stem from disagreements over the funding terms between SDG&E⁶ and prospective developers (discussed further in the *Successes and Setbacks* subsection below). According to the interviewee, an agreement was reached with developers of the Rancho Mission Viejo development, but this agreement dissolved. The preliminary agreement is now being used by SDG&E to develop a case study since a great deal of planning and progress has been made on the development though it is no longer part of this pilot.

The Local Sustainable Communities Pilot is now underway at Civita,⁷ a master planned community in the Mission Valley area of San Diego. Construction will take place over 20 years. The mixed use community will include apartments, townhomes, single family housing, entertainment, shopping, and business centers, as well as parks. To date, the first phase of the 61 apartment units has just been completed and leasing of these units has begun⁸.

This community, as part of the Local Sustainable Communities pilot program, will include the installation of a variety of EE, DR, and DG related measures. Some of the measures mentioned by the interviewee include energy management systems, pool pump controllers, electrically heated spa controllers, energy-efficient room air conditioners, auto lighting controls, smart appliances, plug load controllers, and in-home displays. As stated by the interviewee, the pilot is looking to aggressively pay 75% to 100% of the costs of the EE measures as an incentive. At this stage, according to the interviewee, the installation of DG technologies has not been incorporated into any of the 61 constructed apartment units to date, but is planned to be included in future units.

When the interviewee was asked about whether this development will get to ZNE, he noted that it will be a good partner in such an endeavor. However, with ZNE it comes down to how much it costs the developers to design and install a community that does not rely upon SDG&E’s grid.

⁶ Both SDG&E and SCG were under one management when the Rancho Mission Viejo development was selected as the site for the Sustainable Communities pilot program. Discussion of the failed attempt to use Rancho Mission Viejo as the community development for the Sustainable Communities program is further elaborated upon in the SCG IDSM Process Evaluation.

⁷ Information about this master-planned community that is being built in cooperation with SDG&E’s Local Sustainable Communities Pilot can be found at www.civitalife.com.

⁸ In addition, information about the current status of development at the Civita planned community was found at <http://www.utsandiego.com/news/2012/apr/04/leasing-starts-civitas-first-apartments/>

He stated that, “if you have a dedicated owner and money, then it will work. Otherwise we are stalled out. The owners (of developments) need a lot of help from utilities to get to ZNE. We also provide design assistance, workforce education and training, and marketing support.” He also mentioned that a DR pilot program was been submitted⁹ to the CPUC and this community is the only one to be involved at this point. The program has a budget of \$1.1 million for three years (2012–2014). This program will also help lead the community towards ZNE.

Marketing and Outreach

According to the interviewee, there are no marketing materials or brochures that have been developed by SDG&E for the sustainable communities’ pilot program. The Civita project does maintain its own website (www.civitalife.com) with information that describes the community’s location, the types of mixed use buildings and homes that will be built, and how the development intends to incorporate sustainability into its construction. The website specifically mentions plans to integrate technology and innovative building materials into every part of the community which will reduce waste and help preserve resources. It also lists plans for “solar orientation and energy management systems” along with a shuttle service that uses alternative fuels and a high-efficiency irrigation system designed for reclaimed water.

Budget and Spending

The Local Sustainable Communities Program began more than eight years ago and now that a site has been established for development, it is planned to extend out for another 20 years. According to SDG&E’s April 2012 Energy Efficiency monthly report, the budget for this program for the 2010–2012 program cycle is \$964,081 and expenditures to date are \$45,170. Based on the expenditures, the program has spent under 5% of its budget. This likely stems from the setbacks faced by SDG&E with regard to finding a developer with whom an agreement could be reached regarding the funding from SDG&E to the developer for participating in the pilot. It is expected that this funding will be carried over into the next funding cycle and that the pilot program will continue.

Successes and Setbacks

After overcoming the initial difficulties with finding a developer who could agree to SDG&E’s contractual terms regarding funding, the local sustainable communities’ pilot has been progressing well. An agreement was reached with the developer Sudberry Development, plans for the mixed use community have been laid out, and the first phase of the project has been completed. Significant progress has been made in the incorporation of IDSM through the design

⁹ In interviews with other SDG&E staff that took place at a later date, the evaluation team learned that the DR pilot program was approved by the CPUC.

and implementation of this pilot. Not only does this pilot integrate EE measures and DR controls, the developers have plans to include renewable energy technology where applicable. In addition, the community addresses water efficiency through drought resistant plants and high efficiency irrigation using reclaimed water. By saving water, Civita also is saving energy as well.

The major setback for this pilot comes from the difficulty of finding a building developer who could agree to SDG&E's funding limitations. SDG&E programs, including this pilot program, are funded on a three-year cycle; therefore the staff working on this pilot could only plan for three years worth of spending. According to the interviewee, developers look for funding commitments that extend over 10 years. This created a disconnect between developers and SDG&E since agreements could not easily be reached. This is what led to the breakdown of negotiations between SDG&E and the developer of the Rancho Mission Viejo project. The Rancho Mission Viejo development is still taking place, though it is not being funded by the Sustainable Communities Pilot.

Home Area Network Pilot Programs

General Description

A total of five residential and small commercial home area network DR pilot programs were designed and implemented by SDG&E during the summer of 2011.¹⁰ They were not included on the list of integrated pilot programs assembled by the IDSM Task Force, but the evaluation team felt that home area networks provided customers with the opportunity to integrate across DSM options. The team felt the pilot programs merited further research to determine if this is the case. An SDG&E manager was asked why these pilots were not included on the list of integrated pilots. In response, the interviewee stated that this pilot was considered more of a technology-related pilot as it was examining customers' receptiveness of home area network (HAN) technology. According to the interviewee, "When it was being designed it was not intended to be (integrated) but it just so happens that it touches a lot of areas and integrates a lot of messages from different areas."

The primary purpose of these pilots was to study how home area network technologies are received and used by different groups of residential, low income, and small commercial customers. It was also used to observe whether customers changed their energy usage in general,

¹⁰ A partial list of the names of these home area network pilots was found in the "Home Area Network Pilots Process Evaluation Final Report" completed by Research Into Action, Inc. for SDG&E, May 15, 2012. They are the Residential Automated Controls Technology Pilot – TECH group, the Residential Automated Controls Technology Pilot – In-Home Display group, the Low-Income In-Home Display Pilot, and the Low-Income Programmable Communicating Thermostat Pilot. The Small Commercial Programmable Communicating Thermostat Pilot was not included in this process evaluation.

and during DR events in particular, when they had access to real-time energy use information and energy price information. Different mixes of energy savings technologies were tested and used to observe how participating customers respond to messages and offers of rewards for energy conservation.

The technologies/services included in this pilot are in-home displays (IHDs), programmable communicable thermostats (PCTs), plug load control devices (PLCs), online access to an energy management website hosted by a third-party vendor, and an invitation to participate in a Biggest Energy Saver contest that ranked participants by kWh energy savings relative to the previous year. Participants received different combinations of these technologies based upon their specific pilot. Customers who participated in the pilots received home area network equipment and its installation at no cost. A third-party vendor provided software and home area network devices to customers. The total number of participants who received home area network technology across the five pilot programs was 715 customers.

Marketing and Outreach

Strategies regarding marketing and outreach differed slightly across the five pilot programs, though there were some common messages sent to all customers participating in any of the pilots. Marketing and outreach was used to inform customers about DR programs and how they operate. The messaging also informed participants about how home area network technology can help them respond to DR events. Participants of the pilots also received notification of DR events one day in advance via email, online web portal, through their in-home displays, or some combination of these so that they were made aware of them ahead of time and could therefore plan to respond appropriately.

In addition to receiving information about DR programs, participants of the two low income home area network pilots also received a series of four different EE emails over the course of the program. These emails included EE tips based on the season during which the emails were sent. The pilots were intended to examine how participants respond to DR events given that they have home area network technologies, yet the message of EE was also used in conjunction to help customers with the goal of energy savings. These marketing materials were not developed with integration as the objective, yet the use of EE related emails sent to the participants of the home area network pilots, exemplifies integration. When asked about the integration of DR and EE in the pilots' marketing and outreach materials, the interviewee stated that the pilot programs, which were targeted towards DR, did also inform customers of EE DSM options (in particular, EE) through email. The pilots did not market or provide information to participants about DG.

Budget and Spending

The budget for this pilot program is not listed as a line item in SDG&E's EE Monthly Reports posted on EEGA. When asked about this, the interviewee stated that the budget for this pilot came from more than one source and that there was not a single budget for the program and that it instead came from different funding sources within SDG&E. The back office (administration) funding came from SDG&E's smart meter program filing and the marketing and installation of home area network devices came from both the low income and residential DR program filings. At the time of the interview, the budget and expenditures to date of the pilots were not known, but the interviewee did state that the overall spending for the pilots did not exceed the overall budget. Given that the funding was pooled from a variety of program filings provides evidence for the integrated nature of these pilots.

Successes and Setbacks

According to the manager at SDG&E, the pilots were launched and implemented successfully. According to the survey results presented in the process evaluation of the home area network pilots, participants positively viewed the in-home displays and the ability to monitor and control their thermostats remotely. A majority of the residential participants stated that the devices affected their energy use and agreed that the in-home displays helped them save on energy costs. Additionally, the study provides evidence to show that customers are using the information from their in-home displays and home area network technologies to take action for DR events.

The main setbacks that were encountered with this pilot were largely associated with technical issues related to the installed technologies. According to the process evaluation completed by Research Into Action, residential and low income customers had misconceptions about the in-home displays. Some thought that the presence of the in-home display itself saves energy/money while others were unclear about how to read the information and thought that the data displayed were inaccurate. Aside from this, program staff did encounter some technical issues with the in-home displays during the beginning of the pilot. A few devices showed very high energy usage or daily costs. These issues were corrected when brought to the attention of SDG&E staff.

In order for these pilots to transition into full programs, participants would have to be trained to fully comprehend the functionality and information of the home area network devices so that they could appropriately respond to the feedback they receive regarding their energy use. This is a promising set of technologies that enable integrated DSM, therefore it would be worthwhile for SDG&E to provide an outreach and education component for participants before providing them with in-home displays.

4.2.2 Conclusions

- Two integrated pilot programs and one additional pilot program that feature home area network technologies were reviewed to determine if SDG&E implemented them in such a way that they inform future policy and program submissions regarding integration best practices. They were also reviewed to determine if they offer bundled products that include elements of EE, consumer generation, DR, and the best available AMI technology. The pilots examined for this study are the Local Island pilot, the Local Sustainable Communities pilot, and the Home Area Network Pilot studies.
 - **Local Island Pilot:** Customers of Borrego Springs receive free comprehensive home energy audits that determine appropriate EE improvements and DR controls/upgrades, as well as the self-generation projects that the customer could consider. The monetary incentives and direct install measures offered by SDG&E are based upon the set of measures and/or controls selected by the customer. In all cases, the bonus incentive may only be applied toward qualified audit measures.
 - When asked about the successes of this integrated pilot, the interviewee noted that much of it came from having a single point of contact with the customer for all the energy solutions available, whether it is related to EE, DR, or DG.
 - One major setback was noted by the program manager. When the program was initially rolled out, only one DR program (SDG&E's Air Conditioning Cycling program) was available to the customers in Borrego Springs and during the course of the pilot's operation, this DR program had to be discontinued due to technical issues. Note that SDG&E has now made the Peak Time Rebate DR program available to customers in this area. In addition, a high concentration of solar panels had already been installed by customers prior to their participation in the program.
 - **Local Sustainable Communities Pilot:** The pilot seeks to incorporate IDSM along with smart growth concepts in order to develop an environmentally conscious and sustainable community that minimizes its carbon footprint. After overcoming the initial difficulties with finding a developer who could agree to SDG&E's contractual terms regarding funding, the local sustainable communities pilot has been progressing well.
 - A major setback for this pilot comes from the difficulty of finding a building developer who could agree to SDG&E's funding limitations. SDG&E programs, including this pilot program, are funded on a three-year cycle; therefore the staff working on this pilot could only plan for three years' worth of spending. According to the interviewee, developers look for funding commitments that extend over 10 years.
 - **Home Area Network Pilot:** A total of five residential and small commercial home area network DR pilot programs were designed and implemented by SDG&E during

the summer of 2011. The primary purpose of these pilots was to study how the home area network technologies are received and used by different groups of residential, low income, and small commercial customers.

- A majority of the residential participants stated that the devices affected their energy use and agreed that the in-home displays helped them save on energy costs.
- The main setbacks that were encountered with this pilot were largely associated with technical issues related to the installed technologies.

4.2.3 Recommendations

- **Home Area Network Pilot:** In order for these pilots to transition into full programs, participants would have to be trained to fully comprehend the functionality and information of the home area network devices so that they could appropriately respond to the feedback they receive regarding their energy use.

4.3 Emerging Technologies

According to the latest IDSM Task Force Compliance Tracking Report (Q4 2011), the Task Force and the CA IOUs are tracking emerging technologies that have some combination of EE, DR, and/or renewable self-generation capabilities, or other integrated relationships to potentially pilot integrated product offerings to customers. An ideal example of an integrated emerging technology is LED lights that can be dimmed during DR events. Implementation of successful emerging technologies across demand side management domains is the next step in the statewide effort to reduce energy usage. The section discusses the efforts of Sempra's Emerging Technologies personnel and others that are working to transition integrated emerging technologies to programs at SDG&E and SCG. Specifically, this section describes Sempra's integrated emerging technologies, what directives or guidance have been provided to its emerging technologies program staff regarding integration, proof of concept of the developed emerging technologies, and the technologies that have been tested and incorporated into programs.

A review of the data and discussion with Sempra's emerging technologies program manager shows that Sempra has been able to incorporate EE and DR technologies into the emerging technologies program. It has not had this same success with DG.

Sempra has one team that works across both SDG&E and SCG on the Emerging Technologies Program (ETP). The team's purpose, according to the emerging technologies program manager is to, "build the pipeline of technologies and measures to get them mature and introduce them

into programs related to EE and DR.”¹¹ The team works towards this goal by pursuing the core program elements that have been described in the Program Implementation Plan (PIP) for Emerging Technologies,¹² which are the following.

- **Technology Assessments** – energy-efficient measures that are new to a market or under-utilized for a given application will be evaluated for performance claims and overall effectiveness in reducing energy consumption and peak demand.
- **Scaled Field Placements** – these projects consist of placing a number of measures at customer sites as a key step to gain market traction and possibly gain market information. The measures will typically have already undergone an assessment or similar evaluation to reduce risk of failure.
- **Demonstration Showcases** – large-scale projects will expose measures to various stakeholders utilizing *in situ*, real-world applications and installations. Monitoring activities on demonstration showcases will be determined, as appropriate.
- **Market and Behavioral Studies** – these projects involve targeted research on customer behavior, decision making, and market behavior to gain a qualitative and quantitative understanding of customer perceptions, customer acceptance of new measures, and market readiness and potential for new measures.
- **Technology Development Support** – product development is the process of taking an early-stage technology or concept and transforming it into a saleable product.
- **Business Incubation Support** – Technology Resource Incubator Outreach (TRIO) is a statewide program that focuses on providing training and networking for entrepreneurs and companies providing energy saving technologies.

Because of budget and personnel limitations, the emerging technologies team focused on the first three elements for the 2010-2012 program cycle. The discussion that follows provides examples of how Sempra’s emerging technologies program manager and staff implemented projects that exhibited the first three program elements while also including the concept of IDSM.

4.3.1 Integration Enabling Emerging Technologies

During the 2010-2012 program cycle, Sempra’s program developed two integrated emerging technologies. The first of these technologies is the Hybrid Demand Control/Demand Response system that can be used to curtail energy demand at a pre-determined set point on a daily basis

¹¹ The interviewee was asked about whether the emerging technologies team considers DG in the development of integrated emerging technologies. He stated that there is a limitation to the inclusion of DG in integrated emerging technologies since it is implemented by the California Center for Sustainable Energy (CCSE).

¹² 2010–2012 Energy Efficiency Programs Statewide Emerging Technologies Program Implementation Plan for SDG&E and for SCG.

and a lower set point during DR events. The second is a Wireless Building Management System that incorporates both EE measures and DR controls. The first has been evaluated and a study completed to assess the usefulness of the technology.¹³ The second technology is currently in the testing phase. In addition to these technologies, Sempra was also involved in the development of a demonstration showcase home with the California Center for Sustainable Energy (CCSE) located in Chula Vista, California. This home integrates EE and co-generation and is discussed below.

Hybrid Demand Control/Demand Response

The Hybrid Demand Control/Demand Response technology targets commercial customers and attempts to expand their energy demand management beyond event-driven, reactive DR to continuous proactive demand control that is independent of projected or actual electricity shortages. In this way, energy demand can be reduced and the associated costs can be avoided on a regular basis for those customers who want to take advantage of this technology. The DC/DR hybrid control can be used to reduce demand in response to events, on a continuous basis, or both. These controls can be used independent of whether customers adopt EE measures in their facilities.

In a case study completed by SDG&E, these controllers were placed in a large San Diego hotel to observe whether energy and demand savings were achieved. The studied controller operates by continuously monitoring building demand and curtails HVAC loads whenever demand exceeds a pre-defined target. Additionally, the controller is able to curtail additional demand during DR events. Up to 20 systems can be programmed to curtail load in an order specified by the customer. The study results showed that the demand control mechanism benefits customers and the grid by lowering demand, but continuous control by these devices also lowers the customers' DR capacity. Actively curtailing demand prior to a DR event leaves limited or no capacity for customers to provide during an event. As stated in the study by Negawatt Consulting, "it implies an inherent optimization challenge during system commissioning that needs to be solved on a case-by-case basis: the more aggressive demand control, the less DR capacity, and in turn the less opportunity to benefit from financially attractive DR programs."¹⁴

The study found that the energy savings from the controllers in kWh are insignificant, regardless of whether they are used for demand control, DR, or both. The hybrid technology was not found to be a cost-effective integrated technology.

¹³ Esser, McKnight, and Manning. Negawatt Consulting. "Automated Hybrid Demand Control and Demand Response in Commercial Accounts," prepared for San Diego Gas and Electric Company, 2011.

¹⁴ Ibid, pg. 8.

Wireless Building Management System

The Wireless Building Management System is being used to control and monitor HVAC equipment such as packaged ACs, chillers, boilers, as well as thermostats. The technology allows customers to control their devices through the customer interface and remote computing. To date, a large resort and a library have been selected and equipped as test sites and a third site is in the process of being established. According to the interviewee, the EE stage of testing for the first two sites is complete and shows savings of 5% of baseline usage. This result shows promise for the technology to be adopted into a program offered by SDG&E. The DR testing stage is now beginning in order to determine if this integrated technology can be called upon to reduce load during energy response events. Preliminary analysis shows the technology is most promising during summer-like weather. If this technology successfully reduces load during peak demand, as is expected, then the next stage of development would be to formalize the results in a report and transition the technology into programs offered by SDG&E.

City of Chula Vista Demonstration Showcase

In addition to the above technologies, the emerging technologies program has worked on the integration of EE and renewable technologies in an IDSM showcase home project that was funded through the California Center for Sustainable Energy. This home, located in the city of Chula Vista, was developed as a demonstration showcase. Sempra's EE program staff, emerging technology program staff, and the California Center for Sustainable Energy amassed the funds to update an existing home to produce an example of how EE measures and co-generation can be successfully integrated. The home is equipped with a General Electric home area network (HAN) to monitor energy consumption, solar panels, and high efficiency appliances. At this stage, the home has been retrofit and tours of the home are being conducted by the City of Chula Vista for a six-month period. At the end of this period, energy savings and costs will be analyzed. The home is currently unoccupied to allow for tours; hence it is not feasible to make these measurements at this time.

4.3.2 IDSM Knowledge for Emerging Technologies

The goal of Sempra's Emerging Technologies Program has evolved over time. In the past, the program was used to forward new and innovative energy savings and DR technologies that can be implemented by customers. There was less of a focus on developing emerging technologies that are integrated. Now, however, the focus of the program has moved towards bringing to fruition those potential technologies that are integrated across demand side management domains. When asked if IDSM has been listed as a priority for the emerging technologies program, the interviewee noted that his staff was not explicitly directed to review integrated technologies or projects. The emerging technologies PM elaborated by stating that the lack of explicit IDSM direction is not because IDSM is not important, but rather because IDSM is inherent in the development of emerging technologies to save energy. When asked if the IOU

provided him and his team with any specific guidance or direction regarding the integration of DSM, he stated that they did not. However, “it is part of our thinking. It makes logical sense. The PIP mentions it (IDSM).” Over time, the program has evolved in such a way that it makes logical sense to work on program offerings that not only are energy-efficient, but that can also respond to signals to reduce energy demand during peak hours and/or when an energy action day is declared.

It was interesting to note that the interviewee mentioned that IDSM is listed as a program itself but in his mind, it is really is more of an initiative. He noted that by 2015, it will have a very strong presence and that most offerings will have an IDSM feature. The interviewee noted that the programs are still “in buckets” but that this will change when Sempra files its program plans for 2015. He recognizes that Sempra staff and managers are moving in the direction of adopting IDSM but as far as he knows, “there is no IDSM program with a budget that requires people to go offer bundled solutions.”

The manager of the Emerging Technologies Program stated that a major limitation to developing integrated emerging technologies is his ability to incorporate renewables into the technologies being developed by Sempra. He stated that, “it is difficult to truly integrate with solar since it has different funding” and that the Energy Efficiency Policy Manual says they are not supposed to integrate renewable technologies. Though it is the case that DG has a separate source of funding, DR programs are also funded separately, yet there does not seem to be the same barrier between EE and DR as there is between EE and DG. Nevertheless, a number of IOU staff members mentioned the perception of difficulties associated with the bundling of DG programs with EE and DR due to the CPUC’s funding policies. The emerging technologies program manager noted that while the CPUC’s recognizes that IDSM must include co-generation in order to meet the ZNE standards, its policies do not facilitate the use of co-generation. Sempra is working with other organizations such as DOE and the California Center for Sustainable Energy to develop integrated projects that include DG as a way to overcome this barrier. Regardless of the separation of funding for renewable programs, the emerging technologies program manager tries to capitalize on the integration of solar projects with EE where he can. If he is unable to, he feels that it will not be possible to meet the requirements of ZNE and Advanced Homes.

4.3.3 Proof of Concept

The Hybrid Demand Control/Demand Response technology has been tested but based on the findings of the aforementioned study by Negawatt Consulting, which found insignificant savings from the adoption of these controls, Sempra is not pursuing its inclusion into programs. Offering an incentive for this measure is not in the interest of the utilities as it does not contribute to their energy and demand savings goals. It does result in reducing peak load demand, which is an objective of DR technologies; however other controllers exist and are available at lower cost.

Proof of concept has yet to be established for the Wireless Building Management System. It is in the testing phase at two sites and initial results show that this technology leads to energy savings. The effectiveness of this technology regarding peak demand reduction is currently being examined. Once this study is complete, a determination of proof of concept will be made and next steps regarding the inclusion of this integrated emerging technology will be made.

4.3.4 Inclusion of Integration-Enabling Emerging Technologies

At this point, the integrated emerging technologies described above are not adopted into programs. As discussed in Section 4.1.1, there are no plans to include the Hybrid Demand Control/Demand Response technology. Though this technology is not going to be included, the concept of developing an integrated technology and testing it was successfully executed. Some technologies will not be incorporated into program offerings, but the steps carried out by the emerging technologies team are necessary and are important to the eventual discovery of integrated emerging technologies that are offered to customers.

The interviewee noted that in certain higher level EE technologies, energy savings and demand reduction go hand in hand. From his past experience, he has noticed more difficulty in finding DR technologies that have significant EE savings than finding EE technologies that result in demand reductions that can be called upon when peak demand is high. Armed with this information, the emerging technologies team is more likely to find integrated emerging technologies when developing EE technologies rather than finding or developing DR technologies.

4.3.5 Conclusions

- Sempra developed two integrated emerging technologies. The first, a Hybrid Demand Control/Demand Response system, did not show significant energy savings and was found not to be cost effective. The second is a Wireless Building Management System that incorporates both EE measures and DR controls and is used to control and monitor HVAC equipment such as packaged ACs, chillers, boilers, as well as thermostats. To date it has shown energy savings of 5% from baseline and it is currently being tested for its impact on DR events.
- The manager of the Emerging Technologies Program stated that a major limitation to developing integrated emerging technologies is his ability to incorporate renewables into the technologies being developed by Sempra. He stated that, “it is difficult to truly integrate with solar since it has different funding” and that the Energy Efficiency Policy Manual says they are not supposed to integrate renewable technologies.
- Some technologies will not be incorporated into program offerings, but the steps carried out by the emerging technologies team are necessary and are important to the eventual discovery of integrated emerging technologies that are offered to customers.

4.3.6 Recommendations

- The emerging technologies team at Sempra should continue to develop and test integrated emerging technologies as they have been. In the process, some will successfully show cost-effective energy savings. It is important that funding be allocated towards the inclusion of DG into integrated emerging technologies in order for the emerging technologies team to be able to consider all DSM options in its research and development. As stated by the emerging technologies PM, ZNE will be difficult to achieve without the inclusion of solar in integrated strategies to reduce energy use and reliance on San Diego's grid.

4.4 Integrated Audits Program

As defined in Decision D. 09-09-047, the CA IOUs have been directed by the CPUC to develop standardized audit tools in an effort to identify IDSM strategies to reduce and conserve energy. According to the statewide IDSM PIP developed for the 2010–2012 program cycle, evaluation studies over the last decade have provided evidence to show that energy surveys and customer site audits are powerful tools that develop customer awareness and identify energy conservation potential using EE, DR, and DG programs and technologies. In the absence of onsite audits, online audit tools can also provide customers with customized information about available EE programs, DR programs, energy conservation tips, how their energy rates are affected by their usage on Reduce Your Use event days, and how the installation of solar panels can reduce demand for energy. In other words, onsite and online integrated audit tools help customers develop a broader understanding of how various demand side management options can be integrated.

Currently, the CA IOUs offer integrated onsite audits to medium and large customers (those with demand upwards of approximately 200kW). The CPUC directed the IOUs to develop standardized statewide audits and survey tool portfolios that will customize energy saving recommendations based upon customer profiles, operating characteristics, market sector potential, and cost-effectiveness. The IDSM PIP lists the following areas that are to be incorporated into the development of all of the CA IOUs' Integrated Customer Energy Audit Tools (ICEATs):

- Incorporate electricity/gas, EE, DR and self-generation analysis in all tools and single customer report for each type of audit, as appropriate,
- Incorporate water conservation analysis in association with electricity and gas savings,
- Incorporate green house gas reduction calculators and/or conversion tables, as applicable,
- Refer to or incorporate in audit tools applicable rate analysis modules as appropriate,

- Incorporate IOUs' adopted and recommended emerging technologies, as appropriate, and
- Coordination with the nonresidential Continuous Energy Improvement (CEI) sub-program.¹⁵

Development of the integrated audit tools by the IOUs has been ongoing over the program cycle and during the spring of 2012, each of the utilities have been presenting the capabilities of their tools to the CPUC.

SDG&E's tool provides customers with customized recommendations about available EE programs, DR programs, co-generation opportunities, energy conservation tips, and how their energy rates are affected by their usage on reduce your use event days. The integrated audits therefore encompass all of the DSM technologies to some degree, including the incorporation of AMI.

4.4.1 Program and Integration Goals

An interview was conducted with a program manager at SDG&E who is knowledgeable about the development of SDG&E's online integrated audit tool. According to the interviewee, the CPUC, SDG&E, and the other CA IOUs have engaged in a high level of coordination so that customers who go through the online audit process will receive similar recommendations regardless of which IOU's tool they use. Another landmark feature of this tool is that it has been designed so that customers can use the tool and save their information by creating profiles through SDG&E's My Account online portal. These profiles can be updated as customers make changes that affect their energy usage; the recommendations provided by the tool will adjust accordingly. In the past, SDG&E had online audit tools available to residential and non-residential customers, but these tools were not integrated in such a way that they considered the wide variety of ways customers could save energy. The tools allowed customers to enter their information and receive recommendations based on their input but did not provide customers with the ability to save their input. If customers wanted to use the audit tool again, they would have to re-enter information and generate a new set of recommendations. In addition, the old online audit tools available only generated recommendations if all questions presented to the customers were answered.¹⁶

When customers log in to their accounts through the My Account portal, they can choose to complete the online audit which is referred to as an Energy Profile. This profile asks specific questions about programs the customers are involved in, their heating and cooling, major

¹⁵ 2010-2012 Energy Efficiency Programs: SW Integrated Demand Side Management Program Implementation Plan, p.8-9.

¹⁶ Recommendations are provided through SDG&E's integrated audit tool even if customers only answer a subset of the questions presented.

appliances, insulation, doors, and windows. Once these data are entered, customers can save it to their profiles and new information can be added to it at a later date. This improves the tool's potential for providing integrated energy solutions. Note that the customers are responsible for entering updates to their data, even if they participate in an EE program and/or DR program that led them to receive rebated equipment. SDG&E's program tracking databases would have this information tracked, but it would not be carried through to the integrated audit tool.

The residential online audit tool recently went live on SDG&E's website and the non-residential tool is expected to be brought online in the fourth quarter of 2012. It has been designed to provide recommendations to customers based upon their interests (e.g., eco-friendly, simple straightforward energy saver, etc.), what types of equipment and/or appliances the customers use, which programs they participate in, etc. Data collected by SDG&E's smart meters is also incorporated into the recommendations generated by the audit tool. These data, according to the interviewee, are used in such a way that it allows the tool to provide well informed output regarding programs and behavioral changes that customers can make to reduce their energy usage as well as their demand. Additional features include a solar calculator, the ability to calculate a customer's carbon footprint, and the usage and costs of water as well.¹⁷ The interviewee stated that the audit tool is not only a "great way to connect with the customers," but also serves as a gateway to all of SDG&E's programs. By providing additional information related to DG and water efficiency as it relates to energy savings, this tool integrates the services of other organizations such as water districts and the California Center for Sustainable Energy. An essential purpose of the tool is to make customers aware of the various integrated program offerings available to them.

According to the interviewee, the audit tool provides customers with recommendations related to EE and DR prior to making recommendations about solar panel systems. By taking into account this loading order, the tool provides a more accurate estimate of the number of solar panels required for a residence/facility once energy consumption is reduced through the adoption of EE measures, participation in DR programs, and changes in energy use behavior. While the tool does make recommendations related to solar energy, it is not meant to replace the tools that are used by the California Center for Sustainable Energy. The interviewee stated that the California Center for Sustainable Energy is in the process of reviewing the solar piece of SDG&E's audit tool to make sure it accurately estimates the size of solar systems that homes and facilities would require.

¹⁷ The calculators for solar, water, and carbon footprint are based on the customer's input of information into the integrated audit tool.

4.4.2 Integrated Resources and Support

According to the interviewee, the CPUC and CA IOUs have worked closely to develop an agreed upon structure for the statewide integrated audit tool. The CPUC provided guidance to the CA IOUs regarding the specifications and objectives of the statewide integrated audit tool. From its guidance provided in D. 09-09-047, the IOUs were provided a list of requirements that they were all to follow in order to assure that each of their audit tools complied to the standards set by the CPUC and that they were standardized across utilities. When asked if the utilities and the CPUC were supportive through the development process, the interviewee affirmed that this was the case. Many stakeholders were engaged in the process through conference calls and meetings to make sure that everyone had the same understanding of the requirements of the audit tool. The interviewee also stated that within SDG&E, resources and personnel were more than adequate to successfully develop and test the tool.

4.4.3 Internal/External Integration

Development of SDG&E's audit tool required input of staff members who manage the EE and DR programs, as well as those who are knowledgeable about SDG&E's rate structure. These individuals worked together to coordinate the information needed in order to make the tool operable. Coordination across organizations, such as the CPUC and other CA IOUs, the California Center for Sustainable Energy, water districts, and local governments was also essential to the development of the tool. The interviewee stated that through the development phase, the IOUs held regularly scheduled meetings to decide what components should be included in the tool and what data sources should be relied upon to develop recommendations. As progress was made on the tool by each of the IOUs, meetings across the IOUs were held on an ad hoc basis.

Another organization that is providing valuable input to SDG&E on its tool is the California Center for Sustainable Energy. This organization is in charge of the Self-Generation Incentive Program (SGIP) and the California Solar Initiative in SDG&E's territory, therefore they are reviewing the solar component of the audit tool. In addition, local government offerings will be incorporated as well, though at the time of the interview, the interviewee was not sure of which programs had been included to date. She said that the flexibility of the tool's development will allow it to make recommendations about local government programs. The programs that are included into the tool are dependent on programmatic funding.

4.4.4 Successes and Challenges

Close communication across the IOUs, their vendors, and the CPUC can be counted as a major success of the tool development process. According to the interviewee, the cooperation between SDG&E staff working on the integrated audit tool, as well as the continuous dialogue held with individuals at the other CA IOUs and the CPUC, has led to a clear understanding of what the

objectives of the audit tool are and how they are to be achieved. Supporting documents have been submitted by the CPUC to provide the IOUs detailed guidance on the development of the integrated audits. As stated in Section 5.9 of Decision D. 09-09-047, “the October 30, 2008 Assigned Commissioner’s Ruling (ACR) directed the utilities to submit DSM integration strategies that included an integrated audit tool. Appendix C of the Assigned Commissioner’s Ruling listed specific characteristics and outputs required for an audit tool that would facilitate integration for EE, DR, and DG program offerings to consumers.”¹⁸ Because the CPUC has provided directives such as this, SDG&E and the other CA IOUs have had a roadmap to utilize and follow as they developed their tools.

One setback that arose in the tool development process is that each IOU wanted to use its own third-party vendor. The interviewee felt that it would have been easier to create a standardized tool had they all agreed to use one vendor, but this strategy would not make it easy for each of the utilities to integrate the audit tools into their existing enterprise systems. The IOUs therefore came together and made a decision for each IOU to use its own vendor. SDG&E has used the vendor Aclara for its enterprise system. SDG&E, as well as the other IOUs, had a desire to make their tools consistent with their own website offerings overall. The interviewee noted that as a consequence of using their own vendors, information sharing during planning meetings was not as open. When the IOUs and their vendors would meet to discuss development of their integrated audit tools (in order to ensure they were standardized), the vendors were hesitant to share information that they considered proprietary since the vendors could be considered potential competition.

4.4.5 Marketing

According to the interviewee, there has not been much of a push towards the development of marketing collateral for the integrated audit tool. Most of the focus by the marketing group has been on the testing aspect of the tool from the customer point of view. Assessing the usability of the audit tool has been a priority since it is important to ensure that the tool is easy to understand and not confusing to customers. The interviewee noted that they are close to completion of the audit testing phase and SDG&E plans to launch the tool in the month of June.¹⁹ Once the tool is released, there will be enhancements made based on initial feedback. The large marketing campaign will take place following the implementation of these enhancements. According to the interviewee, “we didn’t want to do a big marketing push until we get some customer feedback once the tool is launched.” After the initial feedback is incorporated, the marketing team will move their focus from usability of the tool to advertising the benefits and usefulness of the tool. She noted that this strategy would avoid having a lot of customers come and use the tool and get discouraged before it is revised based on initial feedback. This might deter customers from

¹⁸ Decision 09-09-047. Pg. 209.

¹⁹ The tool has come online since this interview occurred.

coming back to use the tool if their first experience with it was not favorable or as good as it could be.

4.4.6 Advanced Metering Infrastructure

According to the interviewee, smart meter data are incorporated into the online integrated audits offered by SDG&E in order to customize the energy recommendations made to customers about EE, DR programs, and applicable rates. An additional feature of the tool, according to the interviewee, is that it will calculate a customer's energy usage during peak period for the three hottest of the previous 10 days and provide the customer with an estimate of how much usage must be cut in order to receive an energy credit through the PTR program offered by SDG&E. Without such refined data, such precise recommendations could not be made. The tool can make concrete suggestions on how to reduce demand when DR events are called. Smart meter data allows for the incorporation of load profile data into the integrated audit tool, which is benefit to customers and SDG&E in reducing energy consumption and demand.

4.4.7 Conclusions

- SDG&E's integrated audit tool allows customers to enter information about their residences/businesses and their energy using equipment. Based on the information entered and the historical energy usage data collected from smart meters, SDG&E's tool provides customers with customized recommendations about available EE programs, DR programs, co-generation opportunities, energy conservation tips, and how their energy rates are affected by their usage on reduce your use event days.
- A landmark feature of SDG&E's audit tool is that it has been designed so that customers can use it to generate recommendations and save the data they've entered by creating profiles through SDG&E's My Account online portal.
- One setback that arose in the tool development process is that each IOU used its own third-party vendor. When the IOUs and their vendors would meet to discuss development of their integrated audit tools (in order to ensure they were standardized), the vendors were hesitant to share information that they considered proprietary since the vendors could be considered potential competition.

4.4.8 Recommendations

- The development of the statewide integrated audit tool has been carried out by each of the CA IOUs. Currently, the tool does not track whether customers act on the recommendations they receive. SDG&E could enhance its tool by linking it with program databases to track which customers have carried out the recommendations generated by the tool. The tool could incorporate this information and generate new recommendations based on updated information. Alternatively, SDG&E could send out

periodic emails to customers in order to remind them to update their profiles as a way of making sure they are up to date.

4.5 Account Executives

The role of an account executive (AE) is to examine each of its designated customer's energy usage and needs and provide them with the appropriate combination of energy savings recommendations while taking into account the cost-effectiveness of the solutions they present. SDG&E provided the names of two account executives that could be interviewed for the IDSM process evaluation. One manages large customer accounts in the grocery store and food management customer segment and the other is in charge of the laboratory, biotech, and pharmaceutical customer segment. Both customer segments are heavy energy users that rely upon refrigeration. With the emphasis on IDSM this program cycle, both interviewees noted the importance of including solutions that entail EE, DR, and DG and not just focusing on energy savings that could be achieved through only one of these DSM options.

The account executives who were interviewed stated that they make sure to present EE, DR, and co-generation opportunities to their customers, as appropriate.

4.5.1 Integration Resources and Support

The interviewees were asked about the resources available at SDG&E that allow them to provide customers with programs that offer integrated solutions (i.e., solutions that include EE, DR, and DG). Both noted that SDG&E has a variety of EE and DR programs available that they inform their customers about. The main programs mentioned by the interviewees include the Continuous Energy Improvement program (CEI), Technical Audits/Technology Incentives (TA/TI) program, the Comprehensive Industrial Energy Efficiency program (CIEEP), and DR incentive programs, such as the Peak Time Rebate (PTR) and Critical Peak Pricing (CPP) programs. How their rates are affected by both the quantity of energy consumed and the timing of energy consumption is also discussed with customers since this has a significant effect on energy costs. In addition, SDG&E maintains relationships with the California Center for Sustainable Energy to assist those customers who are interested in including fuel cells and solar options into their energy savings strategies.

According to one of the account executives, the Continuous Energy Improvement program allows customers to integrate all aspects of EE and DR and with the cooperation of the California Center for Sustainable Energy, it can also include co-generation. Continuous Energy Improvement uses a rigorous audit process and helps customers generate a long term roadmap to maximize energy savings. The food management and grocery store account executive stated that he has been in meetings with a national food chain for the past six months and it has adopted a number of integrated solutions. Specific solutions were not mentioned, however the interviewee

indicated that the solutions adopted by this large commercial customer span across DSM options. He noted that since this is a national chain, it is looking to spread its energy savings strategies to their locations in other states. According to the interviewee, it is expensive to invest in energy savings technologies, but in the long run, it results in cost savings.

Another program offered by SDG&E is the Energy Savings Bid program, which allows customers to design their own energy savings project that can be applied at one or multiple locations. Projects proposed through the program must save at least 500,000 kWh per year. In response to the data request sent by the evaluation team, a marketing piece on the Albertson's grocery store chain was provided that described its participation in this program. According to the handout, Albertson's not only installed a number of EE measures such as night covers on refrigeration reach-in cases, variable frequency drives on HVAC fans, and energy efficient refrigeration controls, but it also installed dimmable ballasts to be used with day lighting at its Clairemont location. The handout quotes the Facility and Energy Manager of Albertson's as saying that "this effort involves our skylights in conjunction with our dimmable ballasts on our fluorescent overhead lights. When the light levels go high inside the store, the fluorescent lights will dim so we can keep the right light level for our customers." This location has also incorporated co-generation into its energy strategy by installing a 400 kW fuel cell that allows it to generate approximately 90% of its energy, thereby reducing the demand on San Diego's power grid. This information was provided to the evaluation team to exemplify how customers and account executives can work together and incorporate IDSM into a holistic energy savings solution.

The account executives indicated that some of their customers participate in both the Comprehensive Industrial Energy Efficiency program and Technical Audits/Technical Incentives program, which allows for an integration of EE and DR energy savings. The Comprehensive Industrial Energy Efficiency program is an industrial EE program that is intended to take an integrated approach to EE process solutions, according to one interviewee. It provides commercial and industrial customers with an audit that is used to uncover the opportunities to capture EE. The Technical Audits/Technical Incentives program is a good option for customers interested in DR programs, according to the interviewees. This program focuses on looking at ways customers can implement controls to shed load. It provides customers with an audit to implement controls to then remotely shed load in a DR event scenario. Customers receive SDG&E incentives to help pay for the controls and also can receive incentives by third-party aggregators if they shed load during DR events. It was noted by the laboratory and biotech customer account executive that this segment is not the best for load shedding due to the nature of their operations (they require continuous refrigeration and several air changes per hour through their exhausts), but the food management and grocery store account executive said that a lot of his customers take advantage of the Technical Audits/Technical Incentives program and participate in the Critical Peak Pricing and/or Peak Time Rebate DR programs.

A resource that is available on a limited basis to help fund the higher initial cost of IDSM projects is on-bill financing.²⁰ This resource is offered by SDG&E, but according to one of the interviewees, it is not necessarily a viable option for customers who lease space on a short term basis. To qualify for on-bill financing, which operates like an interest free loan, customers must agree to pay for installed measures and technologies they incorporate over a five-year period. Customers who lease space may not be willing to take on long term investments that save energy such as EE measures and/or DR controls since there is no guarantee that they will be in the same space to recoup the benefits. This option is more attractive to customers who own the space they occupy, but downturns in the economy make them hesitant to make long term investments as well, according to one of the account executives interviewed. Not all companies can take this opportunity because they don't know if they will be around long term.

4.5.2 Internal/External Integration

The PMs of the various offerings keep the account executives informed about the programs so that they can be armed with the information necessary to present to their customers. The account executives are in contact with the managers of all the programs that their customers may be interested in so that they can present these options to customers in their segments. One of the account executives interviewed stated that it is important to look at all the programs in general and then determine which ones are most appropriate for each customer. This interviewee noted that he interacts with the program managers of Energy Efficiency Business Incentives and Technical Audits/Technical Incentives since his customers are most interested in participating in those programs.

Outside of SDG&E, the account executives also interact with the California Center for Sustainable Energy to keep abreast of the co-generation and solar options available for their customers. One of the account executives stated that he constantly reminds his customers of going green and looking at energy alternatives, such as fuel cells. He said that he "tries to act as a catalyst for his customers to integrate solutions. We don't have one program that does (everything)...but that is where the account executives come in." It is his job to integrate the programs and present a comprehensive offering to customers and the incentives that come with them. In addition to talking about solar solutions, he also thinks about ways his customers can save wastewater.

The grocery store and food management account executive noted that since his customers often have locations outside of southern California, decisions about energy savings made by his customers located in SDG&E's service territory often need to be coordinated with the other locations. In fact, this interviewee said that some of the integrated strategies to save energy

²⁰ On-bill financing is available for EE projects, which could free up resources for investment in other DSM options. The availability of this financing may be particularly attractive to IDSM projects with a higher first cost and larger anticipated reductions in future energy bills.

made by his customer are being incorporated in the customer's locations in other states. This requires coordination with electric utilities in and outside of California.

4.5.3 Integration Successes and Setbacks

The interviewees were asked about successes and setbacks they have experienced with integration. The grocery store and food management account executive noted that the Technical Audits/Technical Incentives program has been very successful for his customers. The fact that customers are able to install measures and equipment with controls so that they can remotely control their load and reduce it during DR events has worked well. The Continuous Energy Improvement program has also been extremely successful because it is a comprehensive program that is used to develop a long term roadmap to energy savings through multiple DSM options.

Another successful example of integration was found in data provided by SDG&E to the evaluation team in response to a data request. One marketing piece described the participation of the Genomics Institute of the Novartis Research Foundation (GNF) in both the Energy Savings Bid and Technical Audits/Technical Incentives programs. The Genomics Institute of the Novartis Research Foundation completed 15 EE projects through the Energy Savings Bid program, such as modifications to chiller plant, air handling, and lighting systems to reduce energy usage.²¹ An on-site audit was performed through SDG&E's Technical Assistance program which identified ways to reduce electric load during DR events. The Genomics Institute of the Novartis Research Foundation participated in the Technology Incentives program for DR projects by installing controls and upgrading its building management system. This allowed the firm to participate in SDG&E's Critical Peak Pricing program which allows it to take advantage of a lower year-round electric rate in exchange for accepting higher on-peak rates for a maximum of 15 summer days per year. This customer shows how integrated DSM can be successfully executed.

The major challenge of integration mentioned by both account executives relates to DG. Since SDG&E does not implement the solar programs, it is a barrier to the seamless integration of DG into the holistic energy solutions that the utility can provide. As stated by one interviewee, "we always have to hand (co-generation projects) off." The other barrier related to the integration of solar projects is their long payback period. For those customers who have the capital available, they are able to implement solar projects. According to the biotech account executive, the Salk Institute has been able to install a solar panel system on their roof. It is a privately funded organization that has deep pockets and therefore has the ability to adopt solar into its energy savings strategy.²²

²¹ SDG&E Integrated Award Winners Listing in Response to Data Request #1 sent by Evaluation Team.

²² Third-party owners of solar who lease panels are also becoming more common and are helping to reduce the financial barriers of the initial investment in solar.

Lack of capital in general has been a roadblock in the experience of the biotech account executive. He stated that when smaller biotech companies are in the pursuit of finding a new drug, their funding and future existence is very uncertain. If the company successfully develops a drug, it can expect to have excess capital to invest in their facilities. If it is not successful, then they may not survive. This atmosphere makes it difficult to encourage customers to invest in any energy savings solutions. DR often isn't compatible with the refrigeration and safety requirements while EE and DG require upfront investments from a small financially insecure business.

4.5.4 Use of Marketing Materials

Both interviewees were asked about their use of marketing materials when they make presentations to their customers and both stated that they do not heavily rely on hard copies of marketing materials or on handouts. One noted that the marketing materials are available through SDG&E's website so he can direct his customers to the information online. The account executives' presentations are customized to their customer's specific needs. The account executives educate themselves about SDG&E's program offerings by reading up on the programs and speaking with the PMs. They do not use marketing materials as a main source of information for themselves, nor do they rely on them to inform their customers. One of the interviewees noted that account executives are the ones who tie it all together and therefore their presentations are the materials that are valuable to their customers.

4.5.5 Financial Incentives

The interviewees were asked about their views with regard to the incentives offered by SDG&E to customers to participate in its EE and DR programs. They both noted that incentives work to attract customers. One noted that if the utility offered an additional incentive if a customer participated in programs across DSM options that it would be a motivation for customers to integrate across EE, DR, and DG. One concern with this strategy is when to count a customer's participation across DSM options as an integrated solution eligible for a higher incentive. If a customer has a number of EE projects going prior to this additional incentive being offered, would it be eligible if it installed DR controls and became a participant in a DR program? Regardless, such a "kicker" (additional incentive) might be a good way to attract customers to add DG projects to existing EE and DR projects.

4.5.6 Application Process Integration

To date, there is no streamlined integrated application that simplifies the burden of filling out numerous applications to participate in more than one program. Customers have to fill out one application to participate in an EE program and a completely different one to participate in a DR program. Much of this comes from the need for different types of information for the programs. It also stems from requirements of the CPUC, according to one of the interviewees. Last it is an

artifact of customers choosing to participate in different programs over time and not applying for them simultaneously. When asked, the interviewees did express interest in the development of a single application as it would be a part of an integrated DSM solution.

4.5.7 Conclusions

- Two account executives were interviewed from SDG&E. One manages large customer accounts in the grocery store and food management customer segment and the other is in charge of the laboratory, biotech, and pharmaceutical customer segment. Both interviewees noted the importance of including solutions that entail EE, DR, and DG and not just focusing on energy savings that could be achieved through only one of these DSM options.
- The main programs that account executives' customers integrate include Continuous Energy Improvement, Technical Audits/Technical Incentives, Comprehensive Industrial Energy Efficiency program, and DR incentive programs, such as the Peak Time Rebate (PTR) and Critical Peak Pricing (CPP) programs.
- It was noted by the laboratory and biotech customer account executive that this segment is not the best for load shedding due to the nature of their operations (they require continuous refrigeration and several air changes per hour through their exhausts), but the food management and grocery store account executive said that a lot of his customers take advantage of the Technical Audits/Technical Incentives program and participate in the Critical Peak Pricing and/or Peak Time Rebate DR programs.
- The major challenge of integration mentioned by both account executives relates to DG. Since SDG&E does not implement the solar programs, it is a barrier to the seamless integration of DG into the holistic energy solutions that the utility can provide.

4.5.8 Recommendations

- The account executives interviewed for this evaluation both made mention of the difficulty of including DG in the set of IDSM solutions since the DG programs are not implemented by SDG&E. Both interviewees have worked with customers who have installed DG technologies, showing that SDG&E customers are successful at integrating across more than one DSM option. However, the evaluation team recommends that SDG&E identify the specific barriers account executives and others encounter (or perceive they encounter) when they attempt to include DG as an integrated DSM option.

4.6 Integrated Marketing

The California Long Term Energy Efficiency Strategic Plan (Strategic Plan) lists Comprehensive and Coordinated Marketing as the first of the three levels of integration for DSM options. According to the Strategic Plan, consumers should be informed about DSM options in a unified fashion so that “energy users receive complete DSM information with minimum effort, preferably through single points of contact.”²³ Coordinated DSM Marketing is also listed as one of the four overarching strategies for DSM integration in the Strategic Plan, as it is an “essential component in achieving greater up-take of integrated DSM programs.”²⁴ The near-term plan of implementation outlined by the CPUC includes the streamlining and integration of program outreach for EE, DR, and DG programs. It also states that the IOUs should offer onsite and online audits and technical assistance to identify combined DSM opportunities to customers so that they are made aware of integrated energy solutions that are available to them. Last, the near-term plan regarding the marketing of DSM programs is that it should be performed in conjunction with the deployment of smart meters. Since this technology provides customers with refined data regarding when and how much energy they consume, the marketing of integrated solutions should be in line with the marketing of programs that are enabled by smart meters.

In order to assess SDG&E’s marketing activities related to IDSM, the evaluation team examined marketing collateral developed for both residential and non-residential customers, reviewed a Integrated Marketing PowerPoint presentation given to the IDSM Task Force in May 2012, and interviewed an SDG&E customer programs marketing manager who works with a team to develop marketing strategies for all EE and DR programs for both residential and commercial customers.

SDG&E’s marketing team presents holistic marketing solutions that include set of programs that encompass a variety of DSM options, including EE, DR, and DG. The use of information provided by AMI is not emphasized to the same degree; however it is mentioned as a way to help customers manage their energy use.

4.6.1 Integrated Marketing and Outreach

When asked what integrated marketing and outreach entails, the interviewee stated that it is the presentation of a unified message to the customer of the total package of DSM programs that are most relevant to them. Ideally, the interviewee said, the customer should receive a coordinated marketing message about DSM options that could be incorporated into his or her energy use management. These messages should be delivered to customers using the most appropriate communications channels, such as earned media (also referred to as free media), paid media,

²³ California Long Term Energy Efficiency Strategic Plan, Section 8, DSM Coordination and Integration, p. 68

²⁴ Ibid. p. 69

emails, marketing brochures and handouts, and website links. SDG&E's website has also been designed so that customers can log into their account through the My Account portal and learn about the programs that are of most interest to them. In other words, the interviewee felt that a successful integrated marketing campaign does not entail a presentation of all available integrated strategies through all available communication channels to all customers, but rather a presentation of the right integrated strategies at the right time through the right channels. It is important to have an understanding of the customer segment being marketed to, as the marketing and outreach message differs depending on who the target is.

The approach to integrated marketing described in the IDSM Task Force presentation reiterates the point made by the marketing manager that it should present "the right solution for the right customer at the right time."²⁵ The objectives of integrated marketing are to increase awareness of customer solutions, simplify the method of communication with customers, and maximize marketing dollars through a bundled program approach. Bundling marketing solutions to maximize marketing dollars is a similar strategy to integrated demand side management, as it is a way to maximize energy savings through an integrated approach to energy savings.

The evaluation team inquired about whether SDG&E presents co-generation options in its integrated marketing message and the interviewee stated that it does. However, she noted that since the CSI and SGIP are not offered by SDG&E, she works with the California Center for Sustainable Energy to learn about the programs and decide what information to include in SDG&E's marketing materials.

4.6.2 IDSM Marketing Collateral Development

As part of its day-to-day operations, the marketing team interacts with managers of the various SDG&E programs to gather information about the offerings available to customers. The marketing team speaks with managers of all programs, including those that have been offered year after year, to ensure that it is aware of changes that have been made to the programs' designs. This helps to ensure that the marketing of all programs is up-to-date, consistent, and coordinated. The team strives to understand the big picture and develop materials that have the same look and feel for all program offerings. The team avoids creating one off products for individual programs, as this strategy does not promote IDSM. In the past, each program and its associated marketing and outreach was carried out separately. Over the past couple of years, however, the marketing team's main charge has been to create marketing materials that inform customers of integrated solutions.

²⁵ SDG&E Integrated Marketing Overview PowerPoint Presentation. Presented at the May 2, 2012 IDSM Task Force Meeting. Slide 4.

4.6.3 Integrated Marketing Materials

Electronic versions of residential and non-residential marketing booklets were provided in a response to the data request sent to SDG&E by the research team. Portions of these booklets were also described in the Integrated Marketing Overview presentation made to the Task Force. The interviewee was asked about how these booklets are used in the integrated marketing of DSM programs by SDG&E and she indicated that it serves as the primary piece of marketing collateral for the 2010–2012 program cycle.

Residential Marketing Materials

The first marketing piece is a Whole House Energy Guide directed towards residential customers and integrates numerous strategies for saving energy. The residential umbrella of programs described in the guide includes EE, the California Cash for Appliance program, the residential online survey, energy-efficient lighting options, the Appliance Recycling program, and information on incentives for solar panel installation. In addition, the guide presents information about air conditioning tune ups and strategies to reduce its use and it describes the Summer Saver program, which is a DR program that is available to residential customers. A couple of pages of the brochure are dedicated to saving water with the message that saving water can save energy too. Installing low flow showerheads and faucet aerators reduces water use and the energy used to heat the water.

SDG&E provides this booklet to residential customers at various events and also makes it available at local government offices. The interviewee mentioned that SDG&E is also in the process of setting up contracts that would allow its contractors to distribute copies of this booklet to their customers as well. Contractors who install and/or repair energy equipment such as lighting, HVAC, insulation, or windows could directly benefit by attracting more business if they distributed the books that describe SDG&E's programs. Similar information included in this booklet can be found online at SDG&E's website.

Non-Residential Marketing Materials

The non-residential guide called, "A Guide to Services for Your Business" has also been developed by the marketing team at SDG&E. This topics covered in this guide are more expansive than a presentation of the energy savings programs available to businesses. This guide includes information to start and stop services, presents bill payment options, describes Energy Waves (a tool available to businesses that allows them to graphically view their historic energy consumption data over the past 17 months) and presents information on rates and smart meter deployment. It also informs business customers of energy seminars, onsite and on-line audits, and community business support services. The guide does not delve deep into the details of each of these topics, but rather provides business customers with websites and phone numbers to call in order to find out more information. According to the interviewee, these guides are provided to

all new SDG&E businesses so that they are introduced to the various services available to them with regard to energy.

The marketing team has developed a set of business segment-specific fact sheets that were provided to the evaluation team as examples of integrated marketing collateral. Fact sheets for the following business segments have been developed:

- Hospitals,
- Manufacturing,
- Biotech and laboratories,
- Restaurants,
- Hotels and motels,
- Casinos,
- Grocers,
- Growers,
- Communications,
- Government,
- Minerals and mining, and
- Schools.

In addition to these, a general fact sheet for businesses has also been developed. Each of these sheets focuses on the EE and DR programs most applicable for the given business segment. For example, the hotels and motels fact sheet presents EE programs that would provide incentives to retrofit or install updated HVAC, laundry, lighting, motors, and controls such as occupancy sensors. DR is also listed as an option for hotels and motels to save energy and also reduce their demand during peak hours in the summer. The fact sheets describe audits that can be performed to customize the energy savings solutions customers can use as well.

4.6.4 Successes and Setbacks

According to the interviewee, the marketing team used to develop collateral pieces which focused on individual programs. A portion of each program's budget was dedicated to marketing activities for that program specifically and that was how marketing for energy savings programs were organized. The concept of integrated demand side management gave rise to integrated marketing and the idea that it would be more effective to present a bundled set of solutions to manage and reduce energy usage. Now, SDG&E's marketing team presents holistic marketing solutions that include set of programs that encompass a variety of DSM options.

Different groupings of DSM options are presented to different customer segments, based on what is most appropriate to them.

A successful strategy that was employed for a single year was to provide a financial bonus to customers who signed up for EE programs as well as a DR program. This encouraged IDSM but according to the interviewee, the added bonus was only provided for one year. The interviewee felt it was a successful strategy and thought it could be used again.

When asked how integrated marketing could be improved to encourage customers to adopt IDSM, the interviewee stated that tight budgets affect the marketing team's ability to inform customers of its benefits. With larger budgets, marketing campaigns can be better customized to different market segments. At this point, the integrated marketing budget stems from a combination of EE and DR marketing funds. The interviewee split the DR marketing budget in half and one part was used for integrated marketing. The interviewee plans on asking for the remainder of the integrated marketing budget to come from EE. Currently, she works closely with the marketing team who develops collateral for the advanced metering infrastructure (AMI). In the future, she plans to bring the marketing of AMI into the integrated marketing plan. At this stage, most of the marketing related to AMI is being used to inform customers that they will have smart meters installed and that there is a variety of information available through the My Account portal.

4.6.5 Conclusions

- The approach to integrated marketing described in the IDSM Task Force presentation reiterates the point made by the marketing manager that it should present “the right solution for the right customer at the right time.” Different groupings of DSM options are presented to different customer segments, based on what is most appropriate to them.
- One difficulty mentioned by the interviewee is that since SDG&E is not the implementer of the solar programs, there are no funds that can be allocated to the solar message in the integrated marketing campaign. All marketing dollars are tied to either EE or DR, thus it has not been as easy to include DG into the overall marketing campaign.

4.7 Smart Meters/Advanced Metering Infrastructure

The installation of smart meters throughout SDG&E's service territory, as required by the California Energy Action Plan, facilitates the integration of DSM options and has facilitated the development of a variety of integrated emerging technologies and pilot programs. Smart meters collect and transfer data in such a way that customers can access information about how much energy they use and when they use it through SDG&E's My Account portal. The availability of hourly or 15-minute usage information and the cost consequences associated with electricity

usage and the timing of usage allows customers to make informed decisions regarding their energy consumption.

The My Account portal provides customers with access to their energy data in a variety of ways. Customers can look at their hourly electricity usage data for any day up through the 13 months. When customers click on the “My Energy” tab, a series of charts appear that show the daily energy usage for the week, the average weekly usage, and a comparison of energy usage from the current month this year and last year. If customers complete an online energy audit (referred to as a “home profile” on the website), the page will display a pie chart that shows how the monthly cost of the energy used by the various measures and appliances in their residences. It will also provide customers with a comparison of how much energy customers use compared to their neighbors.

Customers who have an account accessible through SDG&E’s My Account web portal can also sign up to receive “Reduce Your Use” alerts that notify customers via text or email the day prior to a “Reduce Your Use” day. If customers reduce their electricity consumption between the hours of 11 a.m. and 6 p.m. on an event day, they may earn a credit on their electric bill as a reward.

4.7.1 Smart Meter Enabled Web Tools

SDG&E provided information to the evaluation team about a number of web tools that allow customers to view and analyze their energy use data that is collected through their smart meters. The tools listed by SDG&E includes: SDG&E’s Energy Charts available through its secure My Account portal, the Green Button, Google Power Meter, and SDG&E’s Integrated Customer Energy Audit Tool (also discussed in Section 5). Energy Charts and the Green Button are both currently available to eligible SDG&E customers. Google Power Meter was developed and operated by Google, but has been disabled. The integrated audit tool is not a tool that allows customers to view their smart meter data but instead it uses these data to make recommendations regarding DSM options for customers. The integrated audit tool has been released for SDG&E’s residential customers but will not be available to its business customers until the fourth quarter of 2012. Each of these tools is discussed in more detail below.

Energy Charts

Energy Charts is an informational tool that is available through the secure My Account portal on SDG&E’s website. Eligible customers can use this tool to view their electric usage data in the interval measured, either 15 minute or hourly. In addition to the daily view, data can be viewed by week, month (calendar month or bill period), or year. It provides the capability to view historical and temperature comparisons. This tool was rolled out to SDG&E residential and small commercial customers over 2011. This tool and its functionality are expected to be replaced by the new Energy Management Tools in the second quarter of 2012.

According to the information provided by SDG&E, there is an online tutorial available that helps customers understand the data they are viewing. The last page of the tutorial provides Energy Saving Ideas including brief tips as well as links to other pages on SDG&E's website that provides more in depth information

The Green Button

The Green Button is a relatively new tool that provides customers with easy access to their energy usage data and the ability to download their data. The Green Button was launched in December 2011 and is available as part of "Energy Charts" through SDG&E's My Account portal. The Green Button allows customers to export their data into customer and computer-friendly standard formats, thereby allowing further analysis of their energy consumption data. By clicking the Green Button web portal, customers can export up to 13 months of past energy consumption data. The data are delivered in standardized file formats for easy export to other applications. SDG&E expects that access to this information will foster the development of innovative consumer applications and devices from entrepreneurs, businesses, and students.

Google Power Meter

Google's PowerMeter was a widget developed by Google and made available on its iGoogle page. This tool allowed residential customers who were being billed based on their smart meter data to see their hourly electric usage data, graphically depicted, on a daily basis. Additionally, customers could view their data on a weekly, monthly or annual basis. This was a predecessor to SDG&E's Energy Charts. Though no longer in service, PowerMeter had over 12,000 SDG&E customers using the tool. Throughout SDG&E's association with Google, it was able to provide messages and links to its website and these would appear through the message block that was viewable through the tool.

Integrated Customer Energy Audit Tool

SDG&E has developed an Integrated Customer Energy Audit Tool (ICEAT) that is designed to provide customers with an assessment of their energy use and present them with recommendations on how to reduce their energy consumption and peak demand. Recommendations are customized to the energy usage behavior of customers as determined by their smart meter data. This project is a result of the CPUC's mandate to standardized energy audits across the IOUs. The tool not only provides an audit, but also presents customers with specific recommendations for EE, DR, solar PV, solar thermal, and water conservation measures into a single, cohesive customer plan and report. The residential audit has already been released and the non-residential tool will be released later in 2012.

4.7.2 Smart Meters in Integrated Pilots

The Long Term Strategic Plan listed integrated pilots as a promising path to the promotion of DSM integration. The pilot programs that were conducted by SDG&E during this program cycle were either made possible or greatly enhanced by the existence of the advanced metering infrastructure in SDG&E's service territory. The role of AMI and/or Smart Meters in SDG&E's integrated pilot programs is discussed in this section.

Local Island Pilot

AMI is mentioned in the Local Island (LI) Pilot PIP as part of the integrated approaches available to saving energy. Specifically, it says, "this pilot is unique in the level of coordination and integration with other programs like DR and CSI to achieve cross-cutting energy solutions for customers." The program manager was asked about how smart meters have been included in this pilot. As far as he was aware, the role of smart meters has not been advanced through this pilot program to date.²⁶

SDG&E had looked at the installation of home area network (HAN) devices as a direct install measure within the Local Island Pilot, but the cost of home area network devices was too high. There are plans to launch home area network devices to 125 residential customers as part of a Borrego Springs Microgrid/Price Drive Load Management Pilot, scheduled for customer recruitment once the Local Island Pilot is complete. In this next Pilot, funded by federal American Recovery and Reinvestment Act (stimulus) funding grants and CEC funding, home area network is one component of a larger load management program which is designed to include local generation, solar, and residential battery storage in an islanded grid area of SDG&E's service territory. It is planned that recruited customers will receive DR signals via home area network devices, both in-home displays (IHDs) and programmable communicating thermostats (PCTs), on event days beginning in September 2012 through the summer of 2013.

Home Area Network Pilot

As described in Section 3, five residential and small commercial home area network DR pilot programs were designed and implemented by SDG&E during the summer of 2011. These pilots exemplify the integration of AMI with DR and EE. The home area network devices enable the continuous feed of data regarding costs and energy use used by the customers, thereby allowing customers to make more informed decisions regarding how much energy to use and when to use it. The use of in-home displays in these pilots was possible because of the smart meters that

²⁶ If customers involved in the Borrego Springs Local Island Pilot were not informed about the energy consumption data available through the installation of smart meters and explain that PTR rates will be implemented throughout SDG&E's service territory in the summer of 2012, this was a lost opportunity. It is not clear whether this was expressed to customers when their audits were completed. The auditors should have also encouraged customers to sign up for My Account.

have been installed throughout SDG&E's service territory. The information available from these meters allows customers to see their energy usage information in real-time through their in-home displays. In-home displays are capable of presenting information about a customer's real-time energy use and cost information (based upon the tier in which the customer is currently operating in). As described in the process evaluation of the residential and low-income home area network pilots completed by Research into Action for SDG&E (completed May 2012), the information provided by the in-home display participants was valued and increased awareness about how energy is used in a household. Participants reported taking action to reduce their energy use after being exposed to the information presented on their in-home displays.

Local Sustainable Communities Pilot

Smart meters are essential to the full integration of DSM options for Civita, the sustainable community that is currently under development as a pilot program with SDG&E. According to the manager of this pilot, advanced metering infrastructure (AMI) will clearly play a large role in energy management for the community. The installation of a variety of EE, DR, and DG related measures at Civita will rely on an advanced metering infrastructure, including energy management systems, pool pump controllers, electrically heated spa controllers, energy-efficient room air conditioners, auto lighting controls, smart appliances, plug load controllers, and in-home displays. Since the community has only just completed its first stage of development, the full potential of the smart meters has yet to be realized. At this point, according to the interviewee, there are issues with the communication between the smart meters and the smart appliances that are being installed as part of the Sustainable Communities Pilot. The developer and SDG&E are currently working on trying to resolve the communication issues. In his opinion, sometimes people "try to make smart meters smarter than they are."

4.7.3 Integration of Smart Meters and Programs

Program managers, account executives, and SDG&E's director of Customer Programs and Assistance were asked about the integration of smart meters and AMI with the programs they implement, design, and/or promote. There was unanimous agreement that by providing energy usage data from smart meters, customers can improve their energy management. According to the director interviewed by the evaluation team, smart meters can gather detailed information for SDG&E thereby allowing its account executives to better segment customers based on their energy use behavior and determine which DSM options might be most appropriate to present to them.

Account managers who were interviewed about IDSM stated that they explain to their customers the usefulness of smart meter data in energy management. Though some of the web-based tools that use smart meters are not available to non-residential customers at this time, the account managers inform them of these tools. For example, SDG&E has not released its non-residential

online integrated audit tool (release is scheduled for fourth quarter of 2012), but it does provide these customers with access to Energy Waves, an online tool that allows business customers to view their energy usage data. This tool gives non-residential customers the ability to view, download, and display their time-of-use information, demand information, and historical 15-minute consumption data for the past 17 months.

A new construction program manager was asked about whether or not he discusses smart meters with his customers. He commented that since the customers he deals with are working on modeling energy efficient structures and/or homes, they are not interested in hearing about the data or programs facilitated by smart meters. He is not talking to customers about how they can use the data provided by smart meters to determine how EE, DR and DG programs can benefit them. He is not educating his customers about how the smart meter data will facilitate their participation in DR or energy conservation programs; even though he acknowledges that there are benefits to educating customers about it. The interviewee believes that when smart meters and the program facilitated by smart meters are discussed during the construction phase, the message loses impact. He stated that smart meters are not really discussed with the customers he interacts with unless they ask about it specifically.

Though it may be years before a building comes online, the evaluation team believes that the importance of smart meters and how the information they provide can be used to implement IDSM should be conveyed to customers. During this phase, customers make decisions about the types of equipment to install and knowing the level of data they will have access to may affect whether they install certain energy controls, DG technologies, and/or energy-efficient measures.

4.7.4 Conclusions

- Smart meters have made it possible for customers to view their hourly or 15-minute electricity usage as well as the timing of usage. This allows customers to make informed decisions regarding their energy consumption. The rollout of smart meters has provided SDG&E with the opportunity to develop integrated emerging technologies and implement integrated pilot programs. All of the interviewees viewed smart meters and the customer access to the data gathered by them as an asset to the overall goal of saving energy.
- However, not all of the interviewees actively promote the usage of smart meter data to SDG&E customers. The new construction manager interviewed for this evaluation commented that since the customers he deals with are working on modeling energy efficient structures and/or homes, they are not interested in hearing about the data or programs facilitated by smart meters. The interviewee believes that when smart meters and the program facilitated by smart meters are discussed during the construction phase, the message loses impact.

4.7.5 Recommendations

- The evaluation team believes that the importance of smart meters and how the information they provide can be used to implement IDSM should be conveyed to all customers, including those participating in new construction program. During the building phase, customers make decisions about the types of equipment to install and knowing the level of data they will have access to may affect whether they install certain energy controls, DG technologies, and/or energy efficient measures.

4.8 Segment Advisors

Segment Advisors (SAs) present IDSM solutions that are best suited to different customer segments, including residential, commercial, agricultural, hospitality, health care, retail, industrial, and others. A description of the segment advisor position was provided to the evaluation team from SDG&E stating that, “Segment advisors are the customer facing market expert for a given segment...They are responsible for shaping program messages and defining and maximizing appropriate communications channels for (a given) segment.” The segment advisor’s role is to be the focal point of communications for an assigned segment, a responsibility which includes packaging EE/DR offerings, leading development of supporting collateral, and optimizing the delivery channels to an assigned segment. Segment advisors are not responsible for direct communication with customers, but instead design the messages that should be carried to customers, often through account executives. This role is closely linked to marketing; however it makes a special effort to develop integrated solutions for customer segments and formulates a plan to deliver this information to these segments.

The evaluation team interviewed three SDG&E segment advisors who provided insights into their positions and how they are able to foster IDSM for their customers’ energy solutions. The segment advisors interviewed were assigned to the residential, commercial/industrial, and agricultural/mineral mining customer segments. According to the segment advisors interviewed, “we are the ones who create the collateral, plans, and work with account managers to gather the information to make the customer experience complete.”

Depending on the market segment, segment advisors noted that they present EE, DR, and DG solutions for energy management to the customers with whom they interact.

4.8.1 Integration Resources and Support

The segment advisor position was developed at SDG&E to examine the various energy savings solutions that various customer segments can adopt and building roadmaps for each customer segment so that they can maximize their energy savings. As part of the development of this role, a Segment Advisor handbook was written that outlines the following in the overview of their job:

Customer Programs has adopted a segment-based approach to customer management. Segmentation is the art and science of clustering customers into distinct groups based on certain shared characteristics relevant to a company's business. It is a marketing method used to maximize revenue, minimize cost of service and promotions, and manage customer retention. According to the handbook, SDG&E uses segmentation to maximize program participation and customer satisfaction while minimizing the cost of marketing / outreach, customer service and other operations.

Specifically, Customer Program's objectives for the segment-based approach are to:

- *Achieve our EE/DR goals more efficiently and effectively by offering the most relevant energy solutions to the right customers via the channels they respond to the most, at the right time.*
- *Support the utility's image as a trusted partner / energy advisor by speaking our customers' language and to demonstrating our understanding of their unique characteristics and situations.*

Note that the objectives do not list DG goals since SDG&E is not responsible for the implementation of DG programs.

The segment advisors were asked about the types of resources and support made available to them to help them perform their job functions. All of the interviewees stated that they attended IDSM training, though they indicated that they were already familiar with the concept. The Segment Advisor Customer handbook was also mentioned as a resource that helps them understand their positions. Department meetings were also held to discuss the best ways to explain IDSM concepts to customers and get them to integrate energy solutions into their business plans.

4.8.2 Internal/External Integration

In order to determine which integrated DSM solutions can best maximize energy savings for their customer segments, segment advisors investigate the manufacturing processes and energy using equipment that are operated by their segments and what programs would be most beneficial to them. The segment advisors also refer to potential studies, process evaluations, end use studies, and information provided by account executives to determine what equipment is responsible for their energy consumption and demand. The internal cooperation of the groups and information sources within SDG&E helps the segment advisors develop a campaign around major end uses and work on a plan to target offerings for each customer segment.

The agricultural segment advisor stated that greenhouse growers tend to integrate EE and DG by using energy efficient boilers that produce steam. Steam from the boilers can be used to create heat and save natural gas. The interviewee said that greenhouse growers are a large customer

segment that benefits from IDSM. While they do integrate EE and DG, they do not rely on DR programs since very little load shifting is available to them. When the team inquired about this further, the interviewee noted that growers often pump water at night rely on gravity to move water during the day time. Water pumping equipment therefore does not provide much load to shed. They do use some electricity such as intermittent lighting, but demand for lighting is not high during the day.

One of the interviewees mentioned that he saw the greatest opportunity with the K-12 institutional customer segment. Last year, he presented the IDSM concept at a school symposium in conjunction with SCG and SCE. In speaking with school administrators and staff, the interviewee learned that some energy demand could be reduced during peak hours by using slightly less lighting and relying on day-lighting instead. He recognized that the reliance on HVAC could not be reduced during peak hours when school is in session, but this symposium was able to educate the institutional customer segment about DR.

During the symposium, the utilities also educated customers about the importance of analyzing their electricity rates and how their electricity demand affects the rate they pay for their electricity. They also informed the schools' administrators about how the installation of solar would affect their energy demand and consumption as well. One of the other interviewees mentioned that the segment advisors try to talk about technologies and measures with their customers rather than programs. She said that "customers get confused when we talk about programs...(so)...we try to offer services that are not program specific." It is more important to identify what the customer can do to reduce energy use rather than for them to understand what programs they qualify for.

The residential segment advisor mentioned that she develops strategies to increase program participation in accordance with the CPUC Long-Term Strategic Plan and works with managers responsible for program implementation. The interviewee indicated residential programs are cross-promoted noting that the integrated audit tool may be leveraged as a gateway to all programs.

4.8.3 Integration Successes and Challenges

Segment advisors were asked about the integration successes and challenges they experienced as they assist customers with the implementation of integrated energy solutions across DSM options. One of the interviewees provided anecdotal evidence that shows the importance of presenting the right combination of solutions to the right audience at the right time. For example, schools and educational institutions responded positively to the IDSM presentations made by SDG&E, SCG, and SCE. These presentations were made to facilities managers, vice principals, and school administrators in order to educate a wide audience about EE, rates, DG, etc. Having the facilities managers attend the symposium allowed for conversations between

them and utility staff about how to implement the IDSM concept in school settings. It also allowed the interviewee to present logical roadmaps to the solutions they have available. In the case of schools, DR programs are not as applicable due to the inability to shed much load during the afternoon hours, especially during the hotter months.

According to the residential segment advisor, IDSM success includes integration between Residential Customer Programs and Low Income Programs. Low Income customers may participate in SDG&E's Reduce Your Use Rewards Residential Customer Program. The Residential segment advisor has developed program Fact Sheets and an internal training roadmap, which outlines opportunities for program cross-promotion. The Home Energy Efficiency Survey (HEES) is proposed as the gateway to the SDG&E Customer Programs Offering. Marketing initiatives will also include driving increased enrollment in My Account where customers can find the Home Energy Efficiency Survey.

One challenge noted by an interviewee is that not all customer segments are able to make investments in IDSM solutions simultaneously but instead must make incremental investments in EE, DR, and DG. Simultaneous execution of IDSM options is more utility focused and is not always feasible for customers. Capital constraints affect all customer types, therefore segment advisors present their customers with roadmaps to enhance their energy savings and promote the sequential implementation of IDSM solutions. The interviewee noted that she wants to make sure that these customers are acknowledged for their pursuit of IDSM even though all cost-effective DSM solutions are not implemented at the same time. Customers may have a plan to maximize their energy savings, but it may require sequential implementation. This viewpoint, according to the interviewee, should be what guides the IOUs in program design and recruitment for participation.

4.8.4 Use of Marketing Materials

When the segment advisors were asked about their use of SDG&E marketing materials, most noted that they do not rely on them because their information comes from their interactions with program managers and account managers. They also use saturation studies, process evaluation studies, potential studies, and other more in depth information that cannot be found in marketing collateral. Segment advisors design customer segment-specific solutions to energy savings through IDSM and marketing brochures and fact sheets do not provide enough detail for them to effectively perform their job functions. Another interviewee noted that collateral has always been program-centric and that is not what segment advisors promote. Segment advisors instead are interested in developing a road map of energy savings solutions for account executives to use when they speak to customers.

4.8.5 Conclusions

- The segment advisor's role is to be the focal point of communications for an assigned segment, a responsibility which includes packaging EE/DR offerings, leading development of supporting collateral, and optimizing the delivery channels to an assigned segment.
- According to the residential segment advisor, an integration success that is unique to SDG&E is the recent re-organization that has occurred.
- One challenge noted by an interviewee is that not all customer segments are able to make investments in IDSM solutions simultaneously but instead must make incremental investments in EE, demand, response, and DG. Simultaneous execution of IDSM options is more utility focused and is not always feasible for customers.

4.8.6 Recommendations

- Since customers cannot always adopt a holistic set of IDSM solutions at once, utilities should be recognized for encouraging customers to integrate across IDSM options even if their customers take a stepwise approach.

4.9 Integration Tracking and Reporting

To effectively evaluate SDG&E's IDSM implementation efforts, it is essential that the utility maintains a tracking and reporting structure that can readily report data about the programs in which each of its customers are currently participating. It is also important to track the manner in which customers are participating in the programs (such as, tracking what types of EE equipment have been installed and when, how customers plan to respond to DR events, whether customers have co-generation capabilities and if so, what they are, etc.). For example, if a commercial customer operates a large facility and is recruited to participate in a DR program, knowing whether this customer is also participating in an EE program is useful. The prior installation of energy-efficient equipment will affect the DR potential of this customer. Without this knowledge, the estimated baseline impact of this customer for an energy reduction event would be biased. This illustrates the importance of integrating the databases that track customer participation data across DSM options.

SDG&E staff members were asked about whether they track participation in EE, DR, DG, and AMI-enabled programs at the site or account level so that they can determine the integrated participation of its customers and integration across programs. None of the interviewees indicated that such a database exists. SDG&E's PMs maintain program databases, account executives store data about the programs their customers participate in, and SDG&E also has a customer relationship management (CRM) database. These databases are not integrated in such a way that they can provide a detailed tracking report of the programs in which each customer

participates. The interviewees indicated that these various databases are managed separately from each other.

“IDSM tracking is a work in progress,” according to the director of Customer Programs and Assistance. Over the next several years, SDG&E plans to work on a plan to improve the data analytics so that customers who are tightly integrated can be compared to those who are not to determine if there are synergistic benefits that arise. To date, SDG&E does not have a system in place that allows for this level of analysis.

The data gathered from smart meters provides the IOUs with more information about its customers than before. SDG&E is trying to use this information to develop residential customer profiles and commercial and industrial customer segments. This will allow the IOU to market the right DSM options to the right customers.

At this time, the integrated audit tool does have the capability of providing customers with recommendations related to EE, DR, use of AMI, and DG. However, the recommendations provided by the tool are dependent upon the information entered by the customer.

4.9.1 Integration Tracking across DSM Options

From the interviews conducted with SDG&E staff, it was clear that there is a somewhat disjointed view regarding the tracking of integration. A Customer Relationship Management database exists, but PMs and account executives track additional information about the programs and customers they follow that is not necessarily incorporated into the Customer Relationship Management. Even if it is included in the Customer Relationship Management database, it is not clear that the database has the ability to provide reports on the level of integration exhibited by their customers.

One account executive noted that for the customers he works with, he tracks their participation in EE and DR programs. He said that he has looked at his customer groups at times and at their penetration rates of DR to give him a sense of their participation across DSM options. When asked about whether he is familiar with his customers’ participation in solar programs, he noted that he keeps track of this as well, even though it is not centrally tracked by SDG&E since it is not responsible for the implementation of the solar programs. He stated that he just keeps track of his customers and knows about what they are involved in. What is important to note is that the data this account executive tracks is not included in any integrated database and therefore is not available to other staff members who may manage programs. It would be relevant to marketing staff to know what sorts of programs these customers are involved with so they do not try to market programs to them that they are already participating in. It would also be relevant to evaluators of different programs to know what DR controls and/or EE measures customers have

installed and at what point these changes were made in order to develop accurate estimates of energy use for them.

4.9.2 Integrated Audits

The manager who was interviewed about the development of the online integrated audit tools was asked about whether customer information can be tracked and stored by the audit tool. She indicated that the previous tool did not have this capability but the new audit tool does. Customers can use the integrated audit tool by logging on to their accounts through the My Account portal. Once they answer questions about their residences/businesses and about the types of energy equipment they operate, this information is stored so that it does not need to be re-entered. The recommendations that are generated through the audit are also tracked by the audit tool. According to the interviewee, the actions taken in response to the tool's recommendations are not tracked. For example, if the audit tool recommends that a customer participate in an EE lighting program and change out incandescent lamps for CFLs and the customer does so (by participating in an SDG&E program and receiving a rebate), this information is not updated in the customer's energy profile. The tool would require the customer to update the type of lighting he or she has even though SDG&E has this information in a program database.

The interviewee did state that SDG&E has the ability to archive what their customers originally enter into the database and can then examine the changes they make to the database over time. The information about whether customers are acting on recommendations can be viewed through snapshots of the database over time; however it relies on customers making updates to their information. It is not likely that customers will keep their profiles up to date, but may instead enter their information, receive recommendations, and then act upon them without going back and updating their profiles.

4.9.3 Conclusions

- SDG&E's PMs maintain program databases, account executives store data about the programs their customers participate in, and SDG&E also has a Customer Relationship Management database. These databases are not integrated in such a way that they can provide a detailed tracking report of the programs in which each customer participates. The interviewees indicated that these various databases are managed separately from each other.
- The manager who was interviewed about the development of the online integrated audit tools was asked about whether customer information can be tracked and stored by the audit tool. She indicated that the previous tool did not have this capability but the new audit tool does. For example, if the audit tool recommends that a customer participate in an EE lighting program and change out incandescent lamps for CFLs and the customer

does so (by participating in an SDG&E program and receiving a rebate), this information is not updated in the customer's energy profile. The tool would require the customer to update the type of lighting he or she has even though SDG&E has this information in a program database.

4.9.4 Recommendations

- In order for the IDSM initiative to be evaluated and for SDG&E to effectively market programs to its customers, it needs to develop a fully integrated database that allows staff and evaluators to look up all programs that customers are participating in at the site ID and/or account level.

5

Southern California Gas

5.1 Knowledge Enhancement/Training

In the past, DSM options to save energy have been presented to customers based on a single-program approach by the California IOUs. Each energy efficiency (EE) and distributed generation (DG) program was, in many cases, presented separately by Southern California Gas (SCG) and overlapping information about the programs or the benefits of participating in programs across DSM options was not emphasized. While commercial and industrial customers received information about multiple programs by their account executives, the programs were not generally presented in an integrated fashion. This approach required interested customers to seek out information for different programs, a cumbersome undertaking that may have required customers to interact with numerous contacts at their utilities. To minimize this burden and to maximize energy savings for customers, the CPUC's Energy Efficiency Long Term Strategic Plan (Strategic Plan) directs the IOUs to integrate their EE, demand response (DR), advanced metering, and DG programs. Note that the integration of DR is not applicable to SCG unless it works with electric utilities to jointly offer comprehensive energy reduction solutions.

As part of this move towards integrated DSM, it is vital that the staff of the IOUs understand the concept to be able to put it into practice when they offer solutions to their customers. This section of the report focuses upon the existing understanding of the IDSM concept by interviewed employees at SCG. It also describes the training session that was held there to further expose employees to how they can present IDSM options to customers.

In general, IDSM knowledge and training at SCG encompasses EE, DR (though not offered by SCG), and DG. Less emphasis has been placed on the role of Advanced Metering Infrastructure (AMI) in the training sessions.

5.1.1 SCG Interviewee Definitions of IDSM

In order to assess the state of knowledge regarding IDSM by the SCG staff, the research team asked each interviewee what they understood IDSM to mean. Definitions varied across those interviewed but generally speaking, they noted that IDSM consists of a clear presentation of the comprehensive solutions that will help SCG customers reduce their energy use. The DSM options mentioned by many of the interviewees were far more varied than EE and DG. Some

made mention of integration across residential programs in order to capture low income customers, the inclusion of solar thermal, and integration with water utilities since natural gas is the primary heat source for water and is important to consider for overall EE. While some of the interviewees acknowledge the importance of DR for electric utilities, they also made mention of the fact that SCG does not address this since it is a natural gas utility.

Some of the responses received when interviewees were asked what IDSM means to them are as follows:

“IDSM is outlined in the California Strategic Plan. In the plan, it mentions the integration of energy efficiency, distributed generation, and demand response. At SCG we also incorporated water conservation and waste reduction.”

“In my work, IDSM means making sure...we touch upon all the demand side management related programs and make sure they ‘gel’ into one place where a customer can find all the resources they need. It also means we need to make sure all the IOUs are in sync and offer the same types of solutions to their customers.”

“IDSM is an effort to integrate and cross-promote programs for customers. It provides customers with information about all programs – energy efficiency, low income, solar, but obviously no DR.”

“Prior to the workshop, I thought it meant to integrate energy efficiency services for customers. Now, I know it is not just audit advice and energy efficiency programs, but also on-site generation programs such as SGIP (and)... emerging technology programs.”

“The idea (with IDSM) is that the customer goes to one place to get all the information they need about energy.”

Based on the above definitions provided by the interviewees, it is clear that they believe that IDSM is a bundled solution that includes more than just EE and DG. It also includes water conservation and solar thermal solutions. In addition, the interviewees also include the integration across programs in the definition of IDSM as well as the integration across utilities in order to simplify the customer’s experience with energy savings solutions.

5.1.2 Workshops and Training

The evaluation team sent a data request to SCG asking it to provide information about any workshops and/or training sessions that have been held for its employees on the subject of IDSM. In response, SCG stated that it held an hour-and-a-half IDSM training on November 3, 2011 for program management and implementation staff. The presentation, made by Elizabeth Lowe of Barakat Consulting, was designed to teach attendees about the DSM options available

for their customers. In addition, the training session presented success stories in the field. According to the response to the data request, this course was a required activity.

The objectives of the course were listed as follows:

- Describe the purpose of integration, the reasons for it, and the bottom line benefits,
- Understand the regulatory view of integration, integration requirements, and delivery methods,
- List the kinds of DSM programs that can be integrated, and
- Understand how to facilitate the delivery of integrated offerings to customer.

Based on the training presentation, IDSM has many definitions depending on what it is referring to. IDSM can refer to an integrated organizational structure of the IOU, an effort to create an integrated application, integrated marketing which packages energy savings solutions into a single marketing brochure, or an integrated program delivery structure which presents customers with the various programs across DSM options that they can use to maximize their energy savings. The presentation also provides a regulatory definition of IDSM which says that it is the integration of EE, DR, and DG/solar (and low income programs and marketing via advanced metering). As stated earlier, the integration of DR is not applicable to SCG unless it works with electric utilities to jointly offer comprehensive energy reduction solutions.

The training presentation described the challenge faced by the IOUs regarding the “siloed” nature of the various DSM options and how the IOUs are set up so that each has separate budgets for implementation and marketing, separate regulatory proceedings with different timelines, and separate teams who are responsible for the management and implementation of these programs. With such a complex structure, customers must interact with numerous points of contact if they want to find an optimal energy savings strategy. It is also difficult for the different divisions within the IOUs to coordinate to offer integrated solutions when they face different timelines regarding regulatory filings. One notable difference is that larger commercial and industrial customers who work with Account Executives (AEs) generally hear about several applicable programs from this one source. This is not to say that IDSM has been completely implemented by account executives at SCG, but rather that they have made progress on presenting integrated solutions to the customers they deal with.

A sizable portion of the presentation includes slides that describe IDSM metrics, which are to be tracked during the 2010–2012 program cycle and reported once the period is over. The metrics focus upon integrated audits, integrated efforts and organization, and integrated awareness. With regard to integrated audits, the IOUs are required to develop and make available to residential and non-residential customers integrated audits or surveys (both online and on-site). The IOUs are to track the integrated audits that are completed as well as who completes these audits.

The training also describes reporting of integrated efforts. According to the presentation, SCG is to develop and provide status reports that identify how well it has been integrating DSM options including lessons learned, best practices, and improvement plans. The purpose of these status updates is to describe the internal and external frameworks that have been put in place to support IDSM programs and technologies. The IDSM Task Force has carried out this effort by developing joint California IOU quarterly reports since the beginning of this program cycle. Last, the IOUs will report on the awareness and knowledge of relevant staff, such as program managers, account executives, marketing staff, emerging technologies staff and others. This will be completed through trainings, such as the one at which this concept was discussed, as well as through surveys that show what staff has retained and learned.

The remainder of the presentation described the various IDSM efforts being carried out at SCG including the local sustainable communities' pilot, workforce education and training seminars, integrated marketing, and integrated training sessions. It also presented success stories of IDSM carried out by SCG customers including a food services project and the Windset Farms project. Details about these success stories were not included in the slides provided, but they were listed as successful IDSM projects carried out by SCG customers.

5.1.3 SCG Staff Impressions on Training

Many of the staff members who were interviewed for this evaluation were asked about their experiences with the IDSM training and whether or not they were provided with any guidance to help them implement the concepts they learned. Generally speaking, most of the interviewees stated that they had attended training or made presentations during the training about specific topics such as integrated marketing or integration success stories. The director of customer programs, who spoke at SCG's training, felt that it was well attended and informative. She noted that the non-residential programs had already been integrating across DSM options prior to the workshop; the workshop therefore made a point to clarify the importance of documenting the integration of DSM using metrics so that they can be reported to the CPUC in quarterly reports, as required. The director noted that in the future, she would like to hold trainings that cover integration across utilities and how this is carried out. This is especially important for SCG since it supplies natural gas only.

The general feeling expressed by the interviewees was that it was useful to hold a training session on IDSM to make sure SCG staff has a common understanding of the concept and how it can generate comprehensive energy savings. It clarified the definition of IDSM and presented the regulatory requirements that the California IOUs need to meet with regard to integrated audits, emerging technologies, integrated pilots, and IDSM tracking and reporting. One interviewee noted that the material presented at the training was useful to those who were not familiar with the concept and that it gave the staff a realization of how important IDSM is outside of SCG as well. A project manager who was interviewed noted that he and his staff seek

out the emerging technologies team to find out what sorts of integrated measures they might be able to incorporate into their program.

While some of the interviewees felt the IDSM training expanded their understanding of the concept, others noted that they were already aware of a lot of the information that was presented at the training and that it would have been beneficial to hold it earlier in the program cycle. One interviewee stated that, “it covered things we had been doing for some time.” The interviewees who felt that they knew about IDSM were asked where they learned about the concept. One stated that she learned about it through the statewide IDSM program implementation plan. Another stated that the concept of IDSM is integral to his work and therefore he uses the concept daily in his work at SCG.

Interviewees were asked what topics they would have liked to see included in the IDSM training. One noted that it would have been useful to go into more detail about how smart metering can be used on the gas side and how it can be integrated across utilities. He mentioned his interest in figuring out how SCG can work with electric utilities to both present interval data in an integrated manner since those customers will receive their data from two sources, though it should be noted that interval data for gas are not necessarily informative in the same way as electrical interval data are.

5.1.4 Conclusions

- From a thorough review of the data, training presentation slides, and notes taken during interviews, it is clear that SCG has a solid understanding of what IDSM entails. Definitions varied across those interviewed but generally speaking, they noted that IDSM consists of a clear presentation of the comprehensive solutions that helps SCG customers reduce their energy use. Some interviewees mentioned integration across residential programs in order to capture low income customers as well as integration with water efficiency programs since natural gas is the primary heat source for water.
- Most interviewees had already been integrating across DSM options prior to the workshop and felt they had a basic understanding of IDSM. The workshop did express the importance of documenting the integration of DSM using metrics so that they can be reported to the CPUC, as required. The director of customer programs and assistance noted that in the future, she would like to hold trainings that cover integration across utilities and how this is carried out.

5.1.5 Recommendations

- Continue to hold refresher training courses for SCG employees to make sure they fully understand what IDSM entails, not just how it is defined. Refresher training should continue to provide concrete examples of integration to provide staff with a deeper

understanding of IDSM. It should also emphasize the importance of IDSM tracking so that in the future, the CPUC and evaluators can gauge SCG's integration efforts.

- SCG would also benefit from a follow-up training on integration of programs across utilities, integration of advanced metering into programs, and data tracking and reporting for IDSM. Forwarding these concepts will continue to solidify the IDSM initiative carried out by SCG.

5.2 Local Sustainable Communities Pilot

The implementation of integrated pilot programs is one of the strategies described in the Strategic Plan to pursue IDSM. As part of their 2010-2012 portfolios, the IOUs were instructed to consider the development of pilot programs to inform future policy and program submissions regarding integration best practices, offer bundled products that include elements of EE, consumer generation, DR, and the best available advanced metering infrastructure (AMI) technology, and offer different forms of delivery (including third-party and local government platforms) and information access. The 2010-2012 Implementation Goals state the following: "Propose and launch program delivery pilots testing capabilities and effectiveness in the marketplace, including: EE, DR, AMI, and DG."

According to the IDSM Task Force Quarterly Report (Q4 2011), SCG has one integrated pilot, the Local Sustainable Communities (SC) Pilot Program. An interview with the pilot's Program Manager (PM) was conducted in order to determine the purpose of the pilot, the status of the program's progress, whether or not the PM was provided with any guidance or directives to integrate across DSM options, which DSM options are integrated in the offerings to customers through the pilot, and most importantly, assess whether the pilot has been able to integrate DSM options in the program implementation stage. Findings from the interview are presented in this section.

The Sustainable Communities PM noted that there are plans to incorporate EE and DG technologies into the pilot program. Details about the specific technologies that will be included were not available at this early stage of the development of Paradise Valley community.

5.2.1 General Description

The Program Implementation Plan (PIP) for SCG's Local Sustainable Communities Pilot describes it as a flagship program because it enables market transformation "resulting in measurable EE, integrated DR, DG, renewable, and natural resource savings while optimizing long term ecological, social and economic health of California."¹ SCG's focus is upon the integration of EE and DG rather than DR. The pilot seeks to incorporate IDSM along with smart

¹ 2010 – 2012 Energy Efficiency Programs Sustainable Communities Program Implementation Plan, p. 2.

growth concepts in order to develop an environmentally conscious and sustainable community that minimizes its carbon footprint. This pilot has also been designed to provide a path to meet California's long-term EE goals, including zero net energy (ZNE) homes by 2020 and ZNE commercial buildings by 2030.

SCG² selected a community development called Rancho Mission Viejo in South Orange County as the site for the Local Sustainable Communities Pilot. The community developers and SCG came to an agreement about the objectives laid out in the pilot's PIP. However, according to the interviewee, the builder was not willing to abide by the pilot program requirements. The interviewee noted that the builder and SCG disagreed over funding associated with the pilot; therefore SCG looked to other developments to launch the pilot. SCG informed the developer that it could commit to a budget for the duration of the program cycle; the developers however wanted a commitment of a longer time period so that they were ensured financial incentives for their participation. As a result, the project at Rancho Mission Viejo was abandoned and SCG set out to identify alternative sites for the Local Sustainable Communities program.

Three projects were subsequently identified by SCG. They included a development called Paradise Valley in the Palm Springs area, the Irvine Park development in the city of Irvine, and the College of the Desert - West Valley campus located in Palm Springs. The latter two projects were discarded³ and the staff at SCG focused upon the Paradise Valley development for the Local Sustainable Communities Pilot. This community is in its initial phase of development. The development plans include a combination of single family homes, town homes, apartments, and commercial businesses and is planned to provide living and working locations for a variety of demographic profiles. Specifically the site plans include 5,700 to 8,300 dwelling units, 530,000 square feet of office space, 285,000 square feet of retail space, and 200,000 square feet of light industrial space with schools, hotels, and community facilities.⁴ No heavy industrial buildings will be located in this community. Transportation, water efficiency, and reducing the carbon footprint of the community are also being addressed in order to further its pursuit of sustainability. The idea behind this pilot is to develop the entire community with IDSM in mind.

The project is currently in the entitlement stage and full scale approval is expected in mid-2013. The PM of the pilot noted that the developer is keenly interested in partnering with the utility to explore creative uses of technology in its community. After several detailed discussions with the developer, SCG has entered into a Memorandum of Understanding with Paradise Valley. SCG

² Note that SCG and SDG&E were under one management at the time the Rancho Mission Viejo community development was selected as the site for the SC pilot program. The utilities are now managed separately and each IOU is pursuing its own SC pilot program.

³ The Irvine Park development was not selected due to infrastructure issues and the College of the Dessert – West Valley campus was not selected due to a “lack of breadth of products” according to the interviewee.

⁴ “Southern California Gas Integrated Pilots and Projects Overview,” MS PowerPoint Slide Presentation given at the IDSM Joint Task Force Quarterly Meeting held on May 2, 2012.

has retained the services of KEMA to provide design assistance to the developer during the current phase of the project, and to develop a generic training center concept that could potentially be used in other sustainable community projects as well. KEMA's expertise in developing high efficiency and ZNE homes in various climate zones will be brought to bear along with the Emerging Technologies expertise at SCG.

The interviewee was asked about the timeline of the Local Sustainable Communities pilot and he noted that the development will take place over the next 20 years. The Paradise Valley project is at a preliminary stage and has taken some time to get to this point. According to the PM, the developer is completing an environmental report that will go to the county supervisor for review. The slow start and long timeline of this project means that it will be carried out over multiple program cycles.

No specific details were provided about the energy and water efficiency measures that would be incorporated into the development, but both were mentioned in general terms during the interview. This could be due to the fact that the development will not begin construction until mid-2013 at the earliest. The interviewee did note that a wind analysis is being conducted by KEMA for this development in order to assess the ability to incorporate wind as a source of power for the community. Solar, according to the interviewee, will definitely have to be included in order for this community to reach ZNE. He stated that SCG will tell the developer that a certain percentage (not specified) of homes will have to be ZNE and another 50% to 60% will have to be over Title 24. He notes that it will not be possible to make all of the homes ZNE homes due to costs, but rather all he can do is "to encourage the developer to advance the concept with the builders. We have not set the percentages...at this point because the developers will have to convince the builders to do this."

The interviewee was asked if there was a plan in place to encourage the developers to integrate multiple types of DSM into the community. He stated that he is relying upon KEMA (the consultant assisting in this project) because it is KEMA's charge to look at all aspects of sustainable development and he is asking it to look at the Sustainable Communities project and make recommendations for more than just EE. KEMA is currently working on this study so the PM does not have concrete recommendations to share at this time. However, he noted that the beginning stage of the project is the right time to incorporate recommendations to incorporate IDSM.

5.2.2 Marketing and Outreach

According to the PM of this pilot, there has not been a focus on marketing and outreach for the Sustainable Communities Pilot program. SCG has not produced marketing collateral nor has it distributed information about the program. At this stage, the PM feels that developing marketing materials would not be fruitful since the Paradise Valley community has yet to be developed.

The project needs to construct residences and at that point, provide information via marketing collateral to inform potential residents about the unique sustainable nature of the community. When asked if marketing materials will be developed, the interviewee said it may occur in the next program cycle, but this is not certain since the program budget is not very large.

5.2.3 Budget and Spending

The budget for this pilot for the 2010-2012 program cycle is \$828,449. Based on the March 2012 SCG monthly report posted on EEGA, the spending to date for this program is \$352. Since the expenditures on the activities of this program are negligible, the research team sought an explanation from the SCG staff member interviewed about this pilot. He stated that this project is just getting started and that they are at the stage where they will start committing money from the budget. The lack of spending stems from the setbacks faced by SCG with regard to finding a developer with whom an agreement could be reached regarding the funding from SCG to the developer for participating in the pilot. The interviewee stated that he will strongly recommend an extension of the pilot with a carryover of the funds.

5.2.4 Successes and Setbacks

The concept of the Local Sustainable Communities program has a great deal of promise since it was developed with IDSM in mind. The purpose of the development is to integrate across various energy, solar, water, and sustainable growth strategies in order to conserve natural resources of communities. Though it took time to find a suitable developer and development, SCG is now working with the developers of the Paradise Valley community to ensure that it is sustainable and that it incorporates more than one DSM option.

The major setback for this pilot comes from the difficulty of finding a building developer who was willing to agree to SCG's funding limitations. SCG programs, including this integrated pilot program, are funded on a three-year cycle; therefore the staff working on this pilot could only plan for three years' worth of spending. According to the interviewee, developers look for funding commitments that extend over 10 years. This created a disconnect between developers and SCG the developers wanted longer term assurance that they would receive financial incentives for promoting the objectives of the pilot. This is what led to the breakdown of negotiations between SCG and the developer of the Rancho Mission Viejo development.

5.2.5 Playa Vista Sustainable Communities Pilot

An additional Sustainable Communities pilot is being carried out by SCG in partnership with the Los Angeles Department of Water and Power (LADWP) with Playa Vista, a developer. This pilot was mentioned by the PM of the Sustainable Communities Pilot, but was not discussed in detail. Information about this pilot was found in a MS PowerPoint slide presentation that was made during the IDSM Quarterly Task Force meeting that occurred on May 2, 2012. Based on

the information received, a 2,800 unit master planned community has been planned to include single family triplex units, commercial retail center, and a community center. This project recently received court approval and Playa Vista plans to contract and sell parcels to builders in the near future. The developer and the utility working group (including staff from SCG and Los Angeles Department of Water and Power) have held a meeting to review plans, develop sustainability design guidelines for the residential, retail, and mixed use spaces, and discuss the types of incentives that can be offered from both utilities. Incentives from both SCG and LADWP are being offered to developers since they are working jointly to integrate energy and water efficiency in this development. According to the presentation, this project will work to forge strong working partnerships across all parties to help “builder customers participate in (the) full range of program and service offerings offered by utilities⁵.”

5.2.6 Conclusions

- SCG initially selected a community development called Rancho Mission Viejo in South Orange County as the site for the Local Sustainable Communities Pilot. SCG could not promise payment of incentives beyond the current program cycle and as a result the agreement with Rancho Mission Viejo dissolved. Eventually, SCG formed an agreement with the Paradise Valley community development in Palm Desert, California. The development plans include a combination of single family homes, town homes, apartments, and commercial businesses and is planned to provide living and working locations for a variety of demographic profiles. The interviewee was asked about the timeline of the Sustainable Communities Pilot and he noted that the development will take place over the next 20 years.
- The interviewee was asked if there was a plan in place to encourage the developers to integrate multiple types of DSM solutions into the community. He stated that he is relying upon KEMA (the consultant assisting in this project) because it is their charge to look at all aspects of sustainable development. He is asking them to look at Sustainable Communities project and make recommendations for more than just EE.
- When asked if marketing materials will be developed, the interviewee said it may occur in the next program cycle, but this is not certain since the program budget is not very large. At this stage no materials have been developed.
- The major setback for this pilot came from the difficulty of finding a building developer who was willing to agree to SCG’s funding limitations. SCG programs, including this integrated pilot program, are funded on a three-year cycle; therefore the staff working on this pilot could only plan for three years’ worth of spending.

⁵ “Southern California Gas Integrated Pilots and Projects Overview,” MS PowerPoint Slide Presentation given at the IDSM Joint Task Force Quarterly Meeting held on May 2, 2012.

5.2.7 Recommendations

- The difficulties faced by SCG with regard to the Local Sustainable Communities pilot stemmed from finding a developer who was willing to agree to participate in the program despite the commitment of only three years of incentive funding. Since the development of a sustainable community that incorporates IDSM takes significantly longer, the evaluation team recommends setting aside a budget for incentives towards these kinds of projects in order to more easily secure agreements with developers. New construction has potential to integrate DSM and the California IOUs can take advantage of these opportunities more easily if they are able to promise incentives to developers over the construction period. Otherwise, these customers are less likely to agree to participate if they are concerned that they will not be able to reduce the costs of incorporating energy efficient equipment across DSM options.
- Marketing materials have not been developed by SCG, but early in the project's development is the appropriate time to generate interest of potential residents and businesses. Advertising the incorporation of EE and the resulting lowered cost of occupying this space would generate interest early on and provide more of a sense of certainty for the builders that the space they develop will be occupied in the future.

5.3 Energy Savings Assistance Program

According to the Strategic Plan, up to 30% of California's residential customers qualify for low income programs. To serve this community, the California IOUs have been assisting low income customers through the Energy Savings Assistance Program (ESAP). Through this program, income-qualifying customers can receive certain energy efficient equipment and measures at no cost to them in an effort to reduce their energy costs. The Strategic Plan lays out a vision that 100% of eligible and willing customers will have received all cost-effective low income EE measures by 2020. It therefore has directed the IOUs to take a fresh look at their low income programs in such a way that they can be used as an energy resource for California.⁶ Because low income customers represent a sizable proportion of the residential customer segment it is important to make sure that they too are presented with integrated DSM strategies that are feasible for them to adopt.

The evaluation team interviewed the manager of the Energy Savings Assistance Program and the Director of Customer Programs and Assistance to learn about the types of holistic energy savings solutions that are being implemented for low-income customers in California. The low income sector of the residential customer segment is particularly challenging to address with regard to IDSM given the preponderance of rental and multifamily housing, where opportunities for integration may be more limited than in more affluent households.

⁶ California Energy Efficiency Long Term Strategic Plan. p. 23

The team learned that to date, SCG has not integrated DR or DG technologies into its low income program; however, the natural gas utility works with SCE to ensure that low income customers receive EE measures to reduce the use of both natural gas and electricity.

The remainder of this section describes the ways in which SCG has integrated DSM programs with the Energy Savings Assistance Program, the coordination within SCG and with other utilities to provide integrated energy solutions for low income customers, the integrated marketing materials that have been designed to reach the low income customer segment, and the successes and challenges that have been faced in the integration process.

5.3.1 General Description

The Energy Savings Assistance Program offers no-cost energy saving home improvements for low income qualifying renters and home owners. The program also offers customer education about energy and how they can best save on their gas bill. The measures that are installed in the residences of low income customers are based on an assessment of their homes. Energy saving services provided by SCG includes attic insulation, door weather stripping, low flow showerheads and faucet aerators, water heater blankets, pipe insulation, and high efficiency clothes washers. In order to determine if customers qualify, they can call SCG or can go online to its website and fill out a form. Additionally, if customers receive benefits from a program such as Medi-Cal/Medicaid, Women, Infants, and Children (WIC), or receive food stamps⁷, they can automatically qualify for the Energy Savings Assistance Program.

As part of its IDSM initiative, SCG has sought out opportunities to integrate its residential EE programs with low income programs to make sure the entire residential customer sector is addressed. Both the Energy Savings Assistance Program manager and customer programs director pointed this out during their interviews. Customers with lower incomes may not be able to consider the installation of energy-efficient equipment even if they were eligible to receive incentives from SCG. The incentive may not reduce the cost of the equipment enough for low income customers to be able to afford it. Considering that this customer segment would greatly benefit from lower energy bills, it would be a missed opportunity for them as well as SCG if they were unable to install energy-efficient equipment that other residential customers could. The utility has therefore made a concerted effort to direct these customers to the Energy Savings Assistance Program to make sure they benefit from the energy savings that stem from the installation of natural gas saving measures.

When the PM of the low income program was asked about the integration goals for the Energy Savings Assistance Program, he noted that SCG has made efforts to specifically integrate with the multifamily program, Middle Income Direct Install (MIDI) program, and Energy Upgrade

⁷ The full list of programs can be found at <http://www.socalgas.com/for-your-home/assistance-programs/esap/>

California. Integration of these programs helps to ensure that all residential customers are given the opportunity to install cost-effective, energy-efficient measures and that none of them “fall through the cracks” if one program does not offer what a customer is looking for.

5.3.2 Integration Resources and Support

The evaluation team asked the Energy Savings Assistance Program manager about the resources and support provided to him to facilitate the integration of this program into the suite of residential EE programs. He noted that in his mind, it is incumbent upon him and his team to find opportunities for integration and to then plug the program into those channels. He said, “We know our program better than anyone so we should find the ways to integrate it.” When the interviewee was asked whether or not he received any guidance or direction from SCG to integrate his program with other DSM options, he stated that he received no specific guidance documents and that part of his job is to look for opportunities to introduce the low income program to customers who may qualify and benefit from the program.

The PM did state that he and his staff attended an IDSM workshop which provided him with an understanding of the IDSM concept. The training he attended was very general and did not specifically address how his program could be integrated with or into the other program offerings available from SCG. That responsibility of integrating the Energy Savings Assistance Program into the DSM options available for residential customers lies with him and his staff, in his opinion.

5.3.3 Internal/External Integration

According to the interviewee, internal meetings are held between SCG staff to discuss integration efforts across residential programs, including the low income program. The meetings occur on an as needed basis, though he says they occur fairly regularly. The most recent discussions have covered the use of on-bill financing to assist customers who would like to participate in Energy Upgrade California but cannot make the financial commitment to do so. SCG staff has also discussed the possibility of using a multifamily complex as a model and offer the customers located at this complex with a wide variety of programs SCG has to offer in order to make sure all residential customers are able to participate in EE programs. Based on the feedback from both the Energy Savings Assistance Program PM and the director of customer programs and assistance, the evaluation team agrees that SCG has successfully integrated the low income program into the larger set of residential energy-efficient programs.

In addition to the internal meetings held regarding integration across residential programs at SCG, the interviewee noted that one of his staff members attends the internal SCG IDSM meetings to represent the Energy Savings Assistance Program. He attends the meeting mostly to report back on any relevant integration activities and opportunities that might further the opportunities for low income customers to reduce their natural gas usage. Aside from this, the

interviewee stated that he does not work much with the task force, though he provides them with a monthly update of integration activities he and his team carry out.

Outside the utility, the SCG Energy Savings Assistance Program team works with SCE's Energy Savings Assistance Program team since the utilities have overlapping service territories and provide different sources of energy to customers. According to the interviewee, "We have had ongoing successes working with SCE." The two utilities have developed a process where they share data about customers who qualify for the Energy Savings Assistance Program. For example, if SCG performs an assessment on a home and determines that it qualifies for the Energy Savings Assistance Program, it will install natural gas saving measures and then provide this information to SCE so that it can contact the home and provide the customer with electricity saving measures. This close coordination helps to ensure that low income customers are receiving an integrated energy saving solution across electricity and natural gas options.

A similar working relationship has been established between SCG and certain water utilities. If SCG provides low income customers with equipment that reduces the use of natural gas and water such as low flow showerheads and high efficiency clothes washers, the cost of these measures and their installation are split equally between SCG and the water utility. This form of integration has been successfully carried out through the low income program at SCG and has resulted in energy and water savings for the utility and their customers.

5.3.4 Integration Successes and Challenges

According to both interviewees, SCG has had a successful experience integrating the Energy Savings Assistance Program into its suite of residential EE programs. They have helped to ensure that customers who cannot afford to participate in EE programs are still able to receive EE equipment through the Energy Savings Assistance Program and therefore benefit from lower energy bills. This is one way that SCG has worked to increase the penetration of EE regardless of customer income. For example, the director of customer programs described SCG's integrated efforts to install low flow showerheads and faucet aerators to conserve natural gas and water. The multifamily direct installation program provides qualifying multifamily residence owners with no cost installation of this equipment. When the installers come across multifamily residents who are lower income, they refer them to the Energy Savings Assistance Program to make sure they are aware of the opportunities to receive EE equipment if they qualify. This sort of referral by staff of the multifamily direct install program to the Energy Savings Assistance Program helps to improve low income customers' EE and help them save money.

Though this sort of cooperation across residential EE programs has been successful, the interviewees acknowledge that there are some challenges. The structure of the various EE programs differs from that of the Energy Savings Assistance Program which sometimes makes it difficult to make sure that customers who may qualify for the low income program are actually

informed about it. Not all EE direct install program contractors are informed about the low income program and therefore they may not know to look out for low income customers to inform them about equipment they could receive at no cost.

Another challenge faced by SCG relates to its integration with the smaller electricity providers. SCG and SCE have successfully partnered to provide electricity and natural gas to those customers who are in both service territories. They have worked together to jointly present energy saving opportunities related to EE, solar thermal, and DR programs they offer. Smaller municipalities who provide electricity, however, do not have access to the same financial resources as SCE. They therefore are not able to offer the same types of programs that SCE can provide. This affects the integration of electricity and natural gas DSM solutions for those customers located in the service territories of SCG and smaller municipalities that provide their own electricity. It is difficult to ensure statewide IDSM energy solutions since these customers do not have the same set of programs to participate in relative to those who are located in SCG/SCE service territories.

5.3.5 Use of Marketing Materials

According to the director of customer programs, the residential EE marketing materials present the Energy Savings Assistance Program to ensure that low income customers who receive residential EE program marketing collateral are exposed to the opportunities available to them through the Energy Savings Assistance Program to receive energy saving measures for no cost.

In addition, SCE and SCG have developed a joint education guide on natural gas and electric EE measures so that customers do not have to refer to two different information sources to learn about energy savings opportunities. After all, one of the main objectives of the IDSM initiative is to simplify the messaging to customers, thereby making it easier to implement holistic energy savings solutions. When asked if hot water energy savings measures were included in this guide, the manager of the Energy Savings Assistance Program said they were not since SCG/SCE customers receive their water from various entities and the logistics of coordinating with each of these on a single marketing piece would be burdensome. SCG did note that it produces marketing pieces with certain larger water providers who serve customers in its service territory about water efficient and energy efficient measures, such as low flow showerheads, water heaters, water heater blankets, and faucet aerators.

5.3.6 Conclusions

- Based on the feedback provided by a number of staff members, SCG has sought out opportunities to integrate its residential EE programs with low income programs to make sure the entire residential customer sector is addressed. Not only do the residential EE program managers redirect low income customers to the Energy Savings Assistance Program, the manager of the low income program makes sure to thoroughly assess the

residences of low income customers to determine whether they would benefit from attic insulation, door weather stripping, low flow showerheads and faucet aerators, water heater blankets, pipe insulation, and high efficiency clothes washers.

- Outside the utility, the SCG Energy Savings Assistance Program team works with SCE's Energy Savings Assistance Program team since the utilities have overlapping service territories and provide different sources of energy to customers. When SCG installs natural gas saving measures for low income customers, it relays this information to SCE so that it can contact the customer and provide him or her with electricity saving measures.
- SCG has established relationships with water utilities as well. If SCG provides low income customers with equipment that reduces the use of natural gas and water such as low flow showerheads and high efficiency clothes washers, the cost of these measures and their installation are split equally between SCG and the water utility.

5.3.7 Recommendations

- Many of the installations of equipment for residential programs, such as the MIDI program, are carried out by contractors. As mentioned above, these contractors may not be aware of the Energy Savings Assistance Program and their ability to alert customers who may qualify for low income programs. It would be worthwhile to train these contractors about the low income program so that they can make sure that they inform customers who may qualify about opportunities to receive energy efficient measures at no cost.
- While successful relationships have been developed between SCG and SCE, statewide meetings of the managers of the Energy Savings Assistance Program could be held with the specific intent of sharing integration strategies. Since the Energy Savings Assistance Program is a statewide program, meetings with representatives from the California IOUs already occur. It would not be a tremendous burden to add to their meeting agenda the topic of IDSM. SDG&E and PG&E, which supply both electricity and natural gas, may be able to convey additional integration strategies for SCE and SCG to adopt.

5.4 Integrated Audits Program

As defined in Decision D. 09-09-047, the California IOUs have been directed by the CPUC to develop standardized audit tools in an effort to identify integrated DSM strategies to reduce and conserve energy. According to the statewide IDSM PIP developed for the 2010–2012 program cycle, evaluation studies over the last decade have provided evidence to show that energy surveys and customer site audits are powerful tools that develop customer awareness and identify energy conservation potential using EE, DR, and DG programs and technologies. In the absence

of onsite audits, online audit tools can also provide customers with customized information about available EE programs, DR programs, energy conservation tips, how their energy rates are affected by their usage on reduce your use event days, and how the installation of solar panels can reduce demand for energy. In other words, onsite and online integrated audit tools help customers develop a broader understanding of how various DSM options can be integrated.

The CPUC directed the IOUs to develop standardized statewide integrated audit and survey tool portfolios that will customize energy saving recommendations based upon customer profiles, operating characteristics, market sector potential, and cost-effectiveness. The IDSM PIP lists the following areas that are to be incorporated into the development of all of the California IOUs' Integrated Customer Energy Audit Tools (ICEATs):

- Incorporate electricity/gas, EE, DR and self-generation analysis in all tools and single customer report for each type of audit, as appropriate,
- Incorporate water conservation analysis in association with electricity and gas savings,
- Incorporate greenhouse gas reduction calculators and/or conversion tables, as applicable,
- Refer to or incorporate in audit tools applicable rate analysis modules as appropriate,
- Incorporate IOUs' adopted and recommended emerging technologies, as appropriate, and
- Coordinate with the nonresidential Continuous Energy Improvement (CEI) sub-program.⁸

According to Sempra's presentation made to CPUC's Energy Division in May of 2011, SCG's online audit tool provides "an integrated and synergistic approach across EE, DR, Smart Meter, and Advanced Meter web-based energy and billing analysis tools." DG was not explicitly mentioned as a technology that has been incorporated into the tool.

5.4.1 Program and Integration Goals

Similar to the other California IOUs, SCG is developing an integrated audit tool that meets the requirements set forth by the CPUC with regard to IDSM. SCG's Integrated Customer Energy Audit Tool is being developed by Aclara, the same vendor being used by SDG&E for its integrated online audit tool. At this stage, SCG is slightly behind the other IOUs in its integrated online audit tool. SCG recently began the testing of its residential integrated online audit tool in May of 2012, while the other utilities have launched their online tools on their websites. A presentation was made by both SCG and SDG&E to the Energy Division in Q2 of 2012 so that they could demonstrate the capabilities of their tools. According to the program manager interviewed, the SCG's online residential audit tool is scheduled for release in Q4 of 2012 and the small commercial integrated audit tool should be online in Q2 of 2013.

⁸ 2010-2012 Energy Efficiency Programs: SW Integrated Demand Side Management Program Implementation Plan, p.8-9.

The manager interviewed at SCG stated that the integrated audit tool has been designed to serve as a “one stop shop” where customers can respond to questions about their energy behavior and as a result, receive an action plan with concrete recommendations to reduce their consumption of energy. In a presentation made by SDG&E and SCG to the CPUC’s Energy Division in May of 2012, it states that Sempra’s online audit tools provide “an integrated and synergistic approach across EE, DR, Smart Meter, and Advanced Meter web-based energy and billing analysis tools⁹.” In other words, customers’ advanced meter data will be incorporated by the tools in order to generate meaningful integrated energy solutions.

The tool is designed in such a way that customers are taken on a path of energy reduction based on the way they answer questions about their energy usage. SCG’s tool asks customers to select a persona from a list that includes single actor in the home (the main individual in the residence who takes action to reduce energy use), family (all members of the household take part in energy reduction), weekend warrior, or green earth customer (makes efforts at sustainability aside from simply reduction in energy use). The persona selected leads the customers to a set of questions to answer and based on their answers, the SCG tool provides recommendations. Note however, that the tool does not have a way of looking at SCG’s program databases to determine if customers acted upon the recommendations made by the integrated audit tool.

Until the new integrated audit tools are released, SCG is still using the Home Energy Efficiency Survey (HEES) for residential customers and the Energy Challenger Survey for business customers. Both are survey tools that generate customized gas, electric, and water saving recommendations, though there was no attempt to integrate across DSM options in these tools. Both tools are operated by third-parties and so do not have the ability to save customer input nor do they incorporate advanced meter data into the recommendations that are generated. If customers wanted to use the audit tool again, they would have to re-enter information and generate a new set of recommendations. The new tools will also require customers to log in to their accounts through the My Account portal so that customer consumption data will be included in the energy savings tips that are developed.

5.4.2 Integration Resources and Support

The integrated audit tool development team has been well supported in terms of sufficient funding and internal staff, as reported by the interviewee. Materials supplied from the utility to facilitate the tool development processes include the IDSM program implementation plan, which outlined the DSM options that are to be integrated as well as the objective to develop a statewide cross-utility tool. When asked about the components of SCG’s integrated audit tool, the interviewee said that a number of groups within SCG are coordinating to make sure the tool is

⁹ “SDG&E and SCG: ICEAT Update for the Energy Division,” Microsoft PowerPoint Presentation on May 11, 2012. Received in response to data request sent to SCG.

equipped with all of the necessary information including the Energy Savings Assistance Program, EE, and the California Solar Initiative. Since SCG is a natural gas only utility, the focus of the tool has been more on EE rather than on the integration of DR. Since SCG is trying to bring visibility to solar thermal as opposed to photovoltaic panels, there was not a drive to incorporate the benefits of solar panels into its online audit tool.

5.4.3 Internal/External Integration

Development of SCG's tool relied upon the collaboration of groups within the utility as well as the other IOUs. In general, the EE PMs at SCG have provided a lot of information essential to make the tool operational and integrated. There has been a heavy emphasis to make sure that low income customers are also provided with recommendations to reduce energy consumption. There has also been a big emphasis on Energy Upgrade California to target residential customers based on guidance provided by the CPUC for the next program cycle. They are looking to make sure the tool is applicable for the long term.

SCG and SDG&E have coordinated their tool development since they are both Sempra utilities. Both are using the same vendor, Aclara, to develop their Integrated Customer Energy Audit Tools. Aclara developed website enterprise systems for both SDG&E and SCG; therefore both utilities selected this vendor so that their online audit tools could be seamlessly incorporated into their websites. In addition, using the same vendor allows for consistent tool development across both Sempra utilities.

The four California IOUs have met on a regular basis to coordinate the development of their integrated tools, since they were directed to standardize their tools by the CPUC. Initially, SCG met with the other IOUs with an initial belief that they would use the same vendor to develop a statewide audit tool to ensure it was truly standardized, but in the early planning stages, it became clear that the integrated tools would not easily integrate into each IOUs' enterprise systems if they used a vendor different from the ones who had built their websites. Eventually, each IOU chose its own vendors for development of their tools. The IOUs met regularly, approximately once a month, to discuss the components to include in the tools and how they would be developed. These meetings became less frequent once the planning stage was over development phase was entered, according to the interviewee.

5.4.4 Successes and Challenges

The interviewee stated that the coordination within SCG on the integrated energy audit tool has been positive. EE has been the main proponent for SCG and in the interviewee's words, "it is a win-win" to work with the staff of these programs. She noted that since SCG is launching its tool last, she has learned a lot watching the other IOUs as they release their online audit tools. When asked about what she learned through this process, she stated that it is important to be patient with the vendor since implementation of tool development requires time.

The manager interviewed about the tool also noted the importance of keeping the lines of communication with the vendor open to make sure that the online audit tool is being developed as intended. For example, the Integrated Customer Energy Audit Tool relies upon data sources from the Energy Information Administration, Department of Energy, Commercial Buildings Energy Consumption Survey, and the Residential Energy Consumption Survey. While the models within the tool are calibrated for local business conditions, she noted that the databases incorporated into the tool seem to be referencing too high a level of natural gas usage that is not reflective of natural gas usage in California. Recommendations are using the information from these databases and therefore may not be as accurate as they could be if the natural gas databases were for the state of California only.

Similar to comments made by the manager interviewed from SDG&E about its integrated audit, the use of different vendors from SCE and PG&E was seen as a hindrance to the development of standardized audit tools. Meetings to coordinate development across the tools became less frequent and the tools lost some commonality with this decision. In addition, information sharing was not as open since each vendor viewed its tool development process as proprietary.

5.4.5 Conclusions

- SCG has been developing an integrated audit tool that meets the requirements set forth by the CPUC with regard to IDSM. It is being developed by Aclara, the same vendor being used by SDG&E for its integrated online audit tool. At this stage, SCG is slightly behind the other IOUs in its integrated online audit tool. According to the program manager interviewed, the SCG's online residential audit tool is scheduled for release in Q4 of 2012 and the small commercial integrated audit tool should be online in Q2 of 2013. Customers' advanced meter data will be incorporated by the tools in order to generate meaningful integrated energy solutions. According to Sempra's presentation made to CPUC's Energy Division in May of 2011, SCG's online audit tool will provide "an integrated and synergistic approach across EE, DR, Smart Meter, and Advanced Meter web-based energy and billing analysis tools."
- Until the new integrated audit tools are released, SCG is still using the Home Energy Efficiency Survey for residential customers and the Energy Challenger Survey for business customers. Both tools are operated by third-parties and do not have the ability to incorporate advanced meter data into the recommendations that are generated. The new tool is an improvement over Home Energy Efficiency Survey since it will incorporate customers' natural gas consumption as it generates recommendations.
- Some of the databases incorporated into the integrated audit tool seem to be referencing too high a level of natural gas usage that is not reflective of natural gas usage in California. Recommendations generated by the tool are using the information from these

databases and therefore may not be as accurate as they could be if the natural gas databases were for the state of California only.

5.4.6 Recommendations

- SCG's Integrated Customer Energy Audit Tool will not have the ability to track whether customers act on the recommendations they receive. SCG could enhance its tool by integrating it with program databases to track which recommendations were taken by customers. This feedback loop will keep the information in the audit tool current and would therefore not require customers to remember to update the information they enter. It would instead be able to automatically generate recommendations as customers log into the My Account portal.
- An additional recommendation would be to perform a systematic comparison of recommendations and results generated from the Integrated Customer Energy Audit Tool when more localized natural gas consumption data are used. The PM noted that the current databases generate recommendations that are based on national natural gas consumption, which is much higher than the amount consumed in southern California. A revision of these inputs is therefore recommended.

5.5 Integrated Marketing

The Strategic Plan lists Comprehensive and Coordinated Marketing as the first of the three levels of integration for DSM options. According to the Strategic Plan, consumers should be informed about DSM options in a unified fashion so that “energy users receive complete DSM information with minimum effort, preferably through single points of contact.”¹⁰ Coordinated DSM Marketing is also listed as one of the four overarching strategies for DSM integration in the Strategic Plan, as it is an “essential component in achieving greater up-take of integrated DSM programs.”¹¹ The near-term plan of implementation outlined by the CPUC includes the streamlining and integration of program outreach for EE, DR, and DG programs. In order to assess SCG's marketing activities related to IDSM, the evaluation team reviewed marketing collateral and presentations provided by SCG marketing staff, interviewed a segment advisor who oversees marketing for commercial, industrial, and agricultural programs at SCG and a residential program supervisor who has expertise in marketing.

The integrated marketing message carried by SCG includes EE, DR (when discussing SCE's role in energy management), and DG.

¹⁰ California Long Term Energy Efficiency Strategic Plan, Section 8, DSM Coordination and Integration, p. 68

¹¹ Ibid. p. 69

5.5.1 Integrated Marketing and Outreach

The segment advisor interviewed by the evaluation team noted that SCG has established specific goals related to marketing. The first goal is to build awareness using a variety of resources to inform SCG's residential and business customers of the programs it offers, including those that provide EE rebates, onsite and online audits, retro-commissioning, solar thermal solutions, clean transportation options, and incentives for new construction. This encapsulates the IDSM concept and makes sure customers are informed of comprehensive energy solutions. The second goal is to engage different groups of stakeholders that have an effect on program delivery in order to give SCG programs a broader reach. The stakeholders SCG has worked with to develop relationships include trade associations, engineering service customers, vendors, and distributors. SCG informs them of how its programs can help them develop business, thereby providing an incentive for them to engage customers as well.

When non-residential customers are interested in a certain program or energy reducing strategy, SCG marketing staff makes sure to inform them of a variety of options to reduce their consumption of natural gas. For example, the segment advisor noted that he and his staff conduct pool seminars for hotels, schools, and other institutions that maintain large aquatic facilities. During these meetings, SCG staff tries to make sure its customers understand all of the opportunities available to them. The presentation discusses gas fired pool heating, the use of pool covers to reduce the need for heating, and the potential energy savings from the installation of solar pool heating. In addition, SCG's pool seminar also covers ways to reduce water consumption as well. Using pool covers, for example reduces evaporation of water as well as heat loss. The interviewee noted that the message he and his staff carry to their customers is integrated and is directly meeting SCG's marketing goals, which stem from the Strategic Plan.

SCG's marketing team makes other types of integrated marketing presentations as well. These also target medium to large non-residential customers about ways to save energy. One interviewee noted that SCG hosted California's kick-off of the Environmental Protection Agency (EPA)'s Economy, Energy and the Environment (E3) Program for the manufacturing industry. This extremely comprehensive marketing campaign incorporates ways to save gas, electricity, and water. It also informs manufacturers about strategies to reduce toxic pollutants and greenhouse gas emissions. SCG aggressively markets the Economy, Energy and the Environment Program and its customers have shown a high level of interest. The incentive programs offered by SCG are incorporated into the Economy, Energy and the Environment assessment. SCG engineers work with the EPA to perform plant assessments. SCG focuses on ways to reduce energy consumption while the EPA quantifies emission reductions that can be achieved through energy-efficient equipment installation.

5.5.2 IDSM Marketing Collateral Development

The development of integrated marketing collateral began a couple of years ago. The segment advisor interviewed by the evaluation team stated that SCG has always presented an integrated message, but it was not as comprehensive until the California IOUs were directed to present an integrated marketing message in the Strategic Plan. The development of integrated marketing materials for non-residential customers is determined through a process where marketing advisors examine the types of equipment customers already possess in the various customer segments. Marketing advisors engage in this activity to make sure that SCG does not spend its marketing dollars on campaigns to inform customers about equipment they have already adopted. Advisors speak to trade associations and other stakeholders to find out what types of equipment have not saturated the market. This research informs the development of SCG's integrated marketing campaigns.

Both interviewees noted that the marketing staff at SCG does some tracking of website hits in order to determine how well their online marketing campaigns are performing. In addition, the residential program manager discussed the future use of social media outlets and quick response (QR) codes that can be read by smart phones as a way to also track customer interest in EE programs and measures. Use of these codes could also be linked to increased incentives for customers that choose to participate in certain programs. Quick response codes could be included on marketing brochures that inform customers about EE programs or solar thermal solutions. If customers scan and send associated quick response codes, SCG would be able to begin tracking the performance of certain marketing campaigns as well.

5.5.3 Successes and Setbacks

Both the C&I segment advisor and the residential program supervisor has noted that integrated marketing of natural gas and water efficiency with SCG and various water utilities has gone well, particularly with the low income customer segment. Mail-in surveys are sent out to residential customers and once results are received, kits are sent out to them. SCG makes sure to look up whether these customers are on a low income rate and if they are, it follows up by contacting them to see if they can encourage them to participate in Energy Savings Assistance Program. The only issue that SCG has come across with this program is with the lag between receipt of the survey and sending out the water efficiency kits to residential customers. The time lapse, according to the interviewee, could be shortened.

SCE and SCG have also been able to successfully produce joint education guides targeted towards low income customers to make sure that they receive energy efficient measures that cover both fuel types.

No major setbacks related to integrated marketing were noted by the interviewees. Both mentioned that they have engaged in integrated campaigns to market IDSM over the program cycle with success.

5.5.4 Conclusions

- One of the primary goals of SCG's marketing team is to build awareness using a variety of resources to inform its residential and business customers of the programs it offers. These include programs that provide EE rebates, onsite and online audits, retro-commissioning, solar thermal solutions, clean transportation options, and incentives for new construction. These programs, taken together, encapsulate the IDSM concept and the marketing campaign is designed to inform customers of their options.
- Integrated marketing has been carried out by SCG in an effort to make sure that both residential and non-residential customers are informed of the comprehensive energy solutions available to them. SCG works with SCE, other electric utilities, and water utilities to present an integrated message to its customers.

5.6 Advanced Metering Infrastructure (AMI)

The installation of advanced meters throughout SCG's service territory was approved by the CPUC in 2010 for both residential and non-residential customers. The deployment schedule begins in late 2012 and is expected to last through 2017. A battery-powered communication device will be installed on customers' existing analog meters and will operate by turning on for a fraction of a second each day to provide SCG with the data on customers' natural gas usage. SCG's advanced meters will allow customers to view their hourly natural gas usage information, which will provide them with a better understanding of their gas use than previously when they were limited to monthly consumption data. Note that SCG's advanced meters differ from the electric smart meters deployed by the California electric IOUs since it requires the installation of a communication device on existing meters as opposed to a complete change out to a new "smart" meter.

Once advanced meters are deployed and operational, SCG customers will be able to access their usage information through the My Account portal on its website. Customers who have signed up for My Account can view their natural gas usage at the hourly, daily, weekly, and monthly intervals up to as far back as 13 months. This level of detail can help natural gas customers better understand their usage patterns. SCG also plans to incorporate the capability of providing customers with alerts when they have exceeded a pre-specified monthly bill total.

SCG has presented the installation schedule and detailed description of advanced meters on its website in order to prepare customers for the upcoming change. This information walks

customers through the installation process and also informs them of the benefits of the information they will have access to once these advanced meters are online.

5.6.1 Interviewee Perspectives on SCG Advanced Meters

Program managers, marketing staff, account executives, and SCG's director of customer programs were asked about the integration of advanced meters with the programs they implement, design, and/or promote. Of the interviewees with whom advanced meters were discussed, there was unanimous agreement that by providing energy usage data from advanced meters, customers can improve their energy management. A few individuals pointed out that SCG is behind the other California IOUs in the deployment of their advanced meters. This is viewed by some as a benefit as it gives SCG staff the opportunity to observe the deployment of smart meters by the other utilities and learn from their experiences (such as unexpected changes in deployment schedules, issues with the communication of meters to the IOUs, etc.). It has also given SCG staff additional time to determine how the availability of advanced meter data can be used to inform its marketing collateral, pilot programs, integrated emerging technologies, and program offerings.

A number of the interviewees were asked about their specific plans to incorporate the use of advanced meters in the programs they manage. The PM of the local sustainable communities' pilot mentioned that since the Paradise Valley development project is just getting underway, specific plans regarding advanced meters have not been formalized. He said, "*there is no reason why (advanced meters) should not be included...At the appropriate time, we will bring them in and make sure they are part of the integrated solution.*" He noted that KEMA is working on a report that should detail how it can be included, but they have not gotten that far yet.

The manager of the Energy Savings Assistance Program was also asked about how advanced meters will be integrated into the low income program. He noted that with this information, low income customers (as well as all natural gas customers) can make even smarter energy decisions. This information will also allow Energy Savings Assistance Program staff to perform more comprehensive audits and analysis of low income homes they treat through the program. Based on his assessment, the education components associated with the low income program are generalized, but it is possible that the data gathered from the advanced meters can help to better segment the low income customer population and therefore create segmented education pieces that can be distributed, if applicable.

Based on a review of documents provided through the data request sent to SCG, and the interview conducted with the lead of the integrated audit tool development, it appears that advanced meter data will eventually be incorporated into the online integrated audits offered by SCG in order to customize the energy recommendations made to customers. However, because the deployment of advanced meters will begin at the end of 2012 and the integrated audit tool is

scheduled to be released around the same time, advanced meter data will have to be incorporated at a future time. Until then, the recommendations generated by online audit tool will be based upon data input by customers and their monthly natural gas usage.

5.6.2 Conclusions

- Advanced meters will be installed on SCG natural gas meters starting at the end of 2012. It entails the installation of a battery-powered communication device customers' existing analog meters and will operate by turning on for a fraction of a second each day to provide SCG with the data on customers' natural gas usage. These devices will allow SCG to gather data so that customers to view their hourly natural gas usage information, a drastic improvement over viewing monthly natural gas consumption as has been the case to date. This level of detail can help natural gas customers better understand their usage patterns.

5.6.3 Recommendations

- Advanced meters have not been installed to date in SCG territory. SCG has prepared its customers for the installation of them and the benefits of the information they will have access to. The information and marketing campaign is general at this point and SCG would benefit by providing customers with examples of how to use the information provided by advanced meters to make changes to their natural gas usage. Specific examples can illustrate the benefits of advanced meters and how they can be used to promote integrated strategies to reduce energy consumption.

5.7 Program Offerings for Integration

The California IOUs described specific integration activities within each program implementation plan at the statewide and local program levels as instructed by the CPUC. The IDSM concept has been embedded in many of the programs offered by each of the utilities in an effort to provide energy customers with broader solutions to reduce their energy consumption. This section focuses on the feedback received from SCG interviewees regarding the incorporation of IDSM into the programs they supervise, offer, and/or implement. Interviews were conducted with an SCG account executive of large commercial and industrial accounts, the director of customer programs and assistance, a program operations manager for the commercial, industrial, residential, new construction, and agricultural sectors, and the manager of Energy Savings Assistance Program. These interviews were conducted to learn about the experiences these individuals have had with the process of integrating program offerings for SCG customers.

Based on the information provided by the PMs interviewed, SCG has integrated EE with its low income programs, but has not been able to fully integrate DG due to funding issues.

5.7.1 Program and Integration Goals

The CPUC has directed SCG and the other California IOUs to integrate its programs to make sure its customers are presented with comprehensive solutions to save energy. According to the manager of the Energy Savings Assistance Program and the director of customer programs and assistance, SCG has focused heavily on the integration of its residential EE and low income programs. For example, SCG makes a concerted effort to redirect low income customers who are participating in EE programs to the Energy Savings Assistance Program so that they can receive no cost measures to save even more energy. The Energy Savings Assistance Program manager mentioned that he and his staff have worked with the managers of the Middle Income Direct Install (MIDI) program and Energy Upgrade California (EUCA) to make sure that income qualifying customers are informed of the full spectrum of energy saving solutions for which they may qualify. Mostly, these integration efforts are used to make sure that residential customers are directed to the most appropriate EE programs offered by SCG.

SCG has also integrated its non-residential EE programs with co-generation and solar thermal programs, but to a lesser degree. According to the director of customer programs and the commercial and industrial account executive interviewed by the evaluation team, the Self Generation Incentive Program (SGIP) allocated all of its funding last year and was therefore not accepting new applications. At the time of the interview, the program had recently started to accept new applications, thereby providing SCG with the opportunity to more aggressively integrate co-generation into its comprehensive customer energy saving solutions. SCG staff members are in the process of being trained to make sure they are aware of the energy saving opportunities from EE programs and co-generation programs. This information can then be transferred to their customers.

5.7.2 Integration Resources and Support

SCG PMs meet monthly with account executives to educate them about the programs (and any program changes) they have available for customers. The emerging technologies staff also meets with account executives about integrated emerging technologies that their customers may want to adopt. According to the account executive interviewed, if he finds he would like to learn more about a particular energy saving measure or technology, SCG PMs and experts make themselves available to meet with him to answer any questions he may have. The director of customer programs noted that these meetings have served as a forum during which integration can be discussed, though it is not the main focus of these meetings. To date, there are no standing IDSM meetings that occur with account executives or program managers.

Since account executives interact with customers on behalf of SCG, it is essential that they understand each of the programs offered and how customers can integrate them. One of the interviewees noted that there is a dedicated trainer for account executives. It is her job to make sure that the account representatives are exposed to the programs they can offer to their

customers. The evaluation team asked if this trainer has been exposed to the IDSM concept, but the interviewee was not sure.

In addition to the support provided to account executives, the interviewees mentioned the IDSM training workshop they attended. This was seen as an opportunity to learn about how to integrate energy solutions that SCG offers; however a few of the interviewees felt that the training was held too late in the program cycle. One interviewee said that by the time the training was held, “we had already identified ways to integrate.” Aside from the training and reading through the IDSM program implementation plan, interviewees noted that they did not receive much documentation regarding methods by which to integrate DSM options. The Energy Savings Assistance Program manager stated that he felt it was incumbent upon him and his staff to determine the best ways to integrate his program with other EE programs since he is the low income program expert. This would support SCG’s more general presentation of IDSM that was offered at the training.

5.7.3 Internal/External Integration

Internal Integration

As mentioned earlier, SCG has placed a great deal of effort towards internal (i.e., within SCG) integration of residential EE and low income programs. Interviewees also mentioned the integration of solar thermal and EE, but based on their feedback these integration efforts are not as common. An account executive also described the integration of non-residential programs within SCG. He finds that customers often use integrated onsite audits to receive recommendations to reduce energy and then pursue these strategies by participating in the EE programs offered by SCG and their electric and water utilities. One EE incentive program called the Energy Efficiency Calculated Incentive Program (EECIP) is offered to large customers. This program provides customers with an energy and engineering analysis to put together a customized list of measures that would reduce energy consumption. It couples the idea of an energy audit with EE programs. Once this is completed, the customers purchase and install the recommended equipment while receiving incentives from SCG. In some cases, the recommended measures include co-generation as a strategy which means these non-residential customers also may participate in the SGIP. The account executive did note that at this point, the funds for SGIP are reserved for the year which limits customer participation in this program. In other words, the ability to integrate with co-generation is limited by available funding for the SGIP.

External Integration

In addition to integrating programs within SCG, a number of the interviewees mentioned their integration efforts with outside entities such as SCE, other municipal electric utilities, and water utilities to promote energy savings solutions. The director of customer programs noted that SCE

and SCG coordinate closely on Energy Savings Assistance Program. The SCG Energy Savings Assistance Program team works with SCE's Energy Savings Assistance Program team since the utilities have overlapping service territories and provide different sources of energy to customers. If SCG performs an assessment on a home and determines that it qualifies for Energy Savings Assistance Program, it will inform SCE so that it can contact the customer and provide him or her with electricity saving measures. The program operations manager interviewed by the evaluation team also noted that SCG and SCE have a co-funding agreement for certain statewide EE programs. Both utilities offer incentives for gas and electric measures and will transfer the rebates across each other as appropriate.

SCG also works closely with a number of water utilities such as Los Angeles Department of Water and Power (LADWP), Imperial Irrigation District (IID), and the utilities in Glendale, Riverside, and Burbank. Customers are interested in overall resource efficiency and do not necessarily see comprehensive energy saving solutions as IDSM, according to one interviewee. Gas is already an economical energy source, so SCG has had to think about partnering natural gas savings with water savings. For example, when SCG provides low income customers with equipment that reduces the use of natural gas and water (such as low flow showerheads and high efficiency clothes washers), the cost of these measures and their installation are split equally between SCG and the water utility. In addition, SCG and Los Angeles Department of Water and Power recently have put out a cost sharing agreement for joint incentives for thermostatic water valves and low flow showerheads. These examples show how SCG has successfully worked with external entities to develop integrated energy saving solutions.

5.7.4 Integration Successes and Setbacks

The interviewees were asked about successes and setbacks they have experienced with IDSM. Integration within SCG of residential EE programs and the Energy Savings Assistance Program and of the integrated non-residential audits with the calculated incentive program for large commercial and industrial customers has been successful. An account executive noted that working with large non-residential customers requires multiple interactions that occur over an extended period of time. This allows account executives to present multiple strategies to reduce energy and develop a comprehensive solution that customers can implement in stages, if necessary. For example, the account executive noted that he advises customers to reduce their steam demand through EE measures prior to the installation of combined heat and power (CHP) system. This allows for the proper sizing of a combined heat and power system. Several of the interviewees also noted that the integration of programs across utilities, especially between SCG and SCE, has gone smoothly and has benefited many of the customers who are in both service territories.

While SCG has been successful in its integration of programs within the utility and with other utilities, one of the major setbacks noted by the interviewees includes the lack of funding for

energy improvements. There are a number of projects that customers consider for long periods of time, but they lack the capital to pursue the projects. Alternatively, they may be waiting for the right incentives to be offered before they pursue the project. One example can be found in the non-residential market and the adoption of solar water heating. The price of solar water heating is relatively high, thereby making this a niche market for now, according to the director of customer programs. She noted that they have worked to integrate solar water heating into an overall energy saving solution but due to its price point, it is not always adopted. It has been advertised as something new to customers, but until the cost of adopting this technology comes down, it is not a common component of the comprehensive energy solutions adopted by non-residential customers.

One additional setback that was noted by a few of the interviewees is the working relationship with municipalities. They often do not have the same funding available that larger water and electric utilities have, thereby making it difficult to offer integrated measures and programs to customers in a coordinated effort. SCG has noted successful working relationships with SCE and with Imperial Irrigation District, but has had some difficulties coordinating with Los Angeles Department of Water and Power and other smaller municipalities.

5.7.5 Use of Marketing Materials

SCG has focused on developing cross-cutting brochures, an updated website, and other collateral that mention EE, water efficiency, and co-generation for both residential and non-residential customer segments in an effort to promote IDSM. SCG also uses Segment Advisors to work on the roadmap of EE measures that are best suited to particular customer segments. Their feedback is used to help design integrated solutions that incorporate energy savings from reductions in natural gas, electricity, and water consumption. According to the director of customer programs, customers no longer need to figure out which programs would best serve them. Instead, marketing materials and SCG's website present customers with a variety of energy saving solutions; once they select the ones they'd like to pursue, it becomes the responsibility of SCG's staff to determine which programs the customers fit.

A joint education guide was also developed in conjunction with SCE to educate low income customers about both natural gas and electric measures that are available to them at no cost. A similar guide for low income customers has not been developed to present joint natural gas and water saving measures, according to the Energy Savings Assistance Program manager.

Based on feedback from the interviewees, account executives have a different view of the usefulness of marketing materials than do PMs. Very few customers have a need for all programs, according to one interviewee. It is the job of the account executive to pull together appropriate marketing materials for customers, depending on their size and interests. Since each program has its own marketing materials, account executives pull information from them and

from the PMs to develop customized presentations for the larger customers they work with. Additionally, larger customers may be more willing to install newer technologies that may not have been included in existing marketing materials. Account executives inform potential adopters of these technologies about their energy saving benefits through their presentations and during meetings as opposed to marketing collateral.

5.7.6 Application Process Integration

Program applications at SCG are not integrated. At this stage, customers must fill out a separate application for each of the programs in which they would like to participate. According to a number of interviewees, there has been discussion about simplifying the application process; however many of them noted that the information requirements across programs differ. One interviewee pointed out that it would not be easy to change the process because it not only requires the development of a comprehensive application, but also it must also meet the information requirements of evaluators and the Commission. This complicates the process of trying to develop one joint application. The Energy Savings Assistance Program manager mentioned that there has been an effort put forth by SCG to simplify the application for the low income program and minimize the amount of documentation they need to provide.

5.7.7 Conclusions

- As mentioned throughout this evaluation, SCG has focused heavily on the integration of its residential EE and low income programs. Mostly, these integration efforts are used to make sure that residential customers are directed to the most appropriate EE programs offered by SCG. SCG has also integrated its non-residential EE programs with co-generation and solar thermal programs, but to a lesser degree. According to the director of customer programs and the commercial and industrial account executive interviewed by the evaluation team, the SGIP allocated all of its funding last year and was therefore not accepting new applications. This has made it difficult to fully integrate across DSM options for SCG.
- Internal and external integration of programs has been successful at SCG, according to the employees interviewed. It has been important for SCG to integrate since natural gas is not expensive relative to electricity and water. While SCG has coordinated well with SCE and the Imperial Irrigation District, some of the municipalities do not have expansive budgets, thereby making it difficult to coordinate and offer IDSM solutions to customers.
- In order to make sure PMs and account executives are informed about the various energy saving solutions that SCG offers, staff attend training seminars. In addition, a dedicated trainer is available for account executives. It is her job to make sure that the account representatives are exposed to the programs they can offer to their customers. The

evaluation team asked if this trainer has been exposed to the IDSM concept, but the interviewee was not sure.

- Program applications at SCG are not integrated. At this stage, customers must fill out a separate application for each of the programs in which they would like to participate.

5.7.8 Recommendations

- The dedicated trainer for account executives should be well versed in IDSM and the IDSM options that exist at SCG so that she can inform trainees of the opportunities available to their customers. Regular meetings during which IDSM is discussed should also be held with PMs so that they can brainstorm about the possible ways they can integrate their programs. These meetings could also be used as a forum to discuss the integration of program applications as this would simplify the customer experience and also help forward the development and maintenance of an IDSM database.

5.8 Integration Tracking and Reporting

To effectively evaluate SCG's IDSM implementation efforts, it is essential that the utility maintains a tracking and reporting structure that can readily report data about the programs in which its customers are participating. It is also important to track the manner in which SCG customers are participating in programs (such as tracking the types of EE equipment that have been installed and when, whether customers have solar thermal or co-generation capabilities and if so, what they are, etc.). For example, if an SCG residential customer decides to install solar thermal panels for his or her residence, knowing whether this customer has installed certain types of energy efficient equipment (such as a high efficiency clothes washer or low flow showerheads) would be useful and important for the proper sizing of the solar thermal system. This illustrates the importance of integrating the databases that track customer participation data across DSM options. It also highlights the importance of developing a tracking system that is capable of tracking integration across utilities that provide natural gas, electricity, and water.

SCG has made it a practice to track the programs in which its customers are participating. These include EE, low income, and co-generation programs (such as the California Solar Initiative and Self Generation Incentive Program). It does not track the DR programs in which its customers participate.

5.8.1 Integration Tracking across DSM Options

According to the director of customer programs and assistance, SCG tracks the programs in which its customers are participating. These include EE, low income, and co-generation programs (such as the CSI and SGIP). While this indicates that SCG does maintain program databases that follow participants, some of the interviewees stated that the program databases are

managed separately from each other. These program databases are currently not integrated in such a way that they would allow SCG staff to automatically create a customer report of all of the programs in which a customer participates. As one program manager stated, “We don’t currently have a mechanism that pulls up a single view of the customer to see how they have integrated. SCG is working on developing this.” The data are available to develop an integrated data tracking and reporting system, but such a system does not exist at SCG (or the other California IOUs) to date.

The director who was interviewed did talk about how data tracking differs for residential versus non-residential customers. Residential customers who participate in EE programs are generally not the same customers who qualify for the Energy Savings Assistance Program. If they qualify for the low income program, they do not participate in the residential programs because they can receive the same EE equipment at no cost through the low income program. The interviewee acknowledged that there is no way to track whether any of their customers make purchases of energy-efficient equipment that they would provide at no cost to low income customers or for a rebate to residential customers. This is not an issue specific to SCG and would affect the other IOUs as well. On the non-residential side, account executives keep track of whether their customers participate in SCG EE programs as well as SGIP. These tracking efforts are used to determine whether non-residential customers have exhausted all of their cost-effective program opportunities to save energy. If not, account executives who work with larger customers can find out which programs their customers have not participated in and inform them of these energy saving opportunities.

The evaluation team was interested in finding out if SCG tracks the recommendations made by account executives and whether their customers adopt the recommended EE measures. One account executive noted that at this point, there is interest in tracking this but no standardized method to track this information has been implemented. He noted that the goals of account executives to date are related to therm savings, number of audits, etc. These metrics have been tracked separately and not tracked as integrated efforts. He did note that within the natural gas world, “We are always integrating...Tracking is a different question. We don’t have people working in silos. Engineers who work on EE measures are the same ones who work on ET, and DG. They are well rounded and informed. So if they talk to customer, they have the background to suggest other DSM tools.” This indicates that integration is a concept embedded in the staff at SCG, but that tracking of integration has not been fully developed.

One interviewee noted that SCG has tracked program participation by its customers, but to date there has not been any requirement by the CPUC to report this information. IDSM data tracking has been carried out by SCG so that it can learn about the integration solutions that have worked and can be promoted to customers who have not taken advantage of them to date. According to the interviewee, SCG could report this data out if the CPUC mandated it to do so.

5.8.2 Integration Tracking Across Utilities

According to the staff interviewed, there is no systematic tracking of participation in programs at electric or water utilities by SCG. There has been no requirement to track this information by the CPUC; therefore it has not been a priority. SCG has promoted the integration of energy solutions with electric utilities, such as SCE, and water utilities, such as the Imperial Irrigation District, but it has not kept records of which customers have integrated across DSM options across utilities. According to one interviewee, data tracking and reporting of customer participation in program across utilities would be useful for IDSM and increasing energy savings.

With that said, SCG does have solid relationships with SCE and the Imperial Irrigation District to ensure that they cross promote their programs when they interact with customers who could benefit from energy savings solutions that have not been implemented to date.

5.8.3 Conclusions

- SCG noted that it tracks the programs in which its customers are participating including EE, low income, and co-generation programs. However, it does not track the DR programs in which its customers participate. While this means that SCG maintains program databases, some of the interviewees noted that the program databases are managed separately from each other. This limits the ability to generate automated customer reports that present integrated views of each SCG customer.
- Account executives keep detailed data about the programs in which their customers participate. They also note the recommendations they make based on the current set of programs customers are benefitting from and ones they have not yet participated in. While recommendations are tracked, the account executive interviewed noted that there is no standardized method that tracks which recommendations are acted upon by these customers. There is interest in maintaining such a database, according to the interviewee.

5.8.4 Recommendations

- SCG does maintain certain data about its customers and program databases with lists of participants and the measures they install, however these databases are not integrated in such a way that they can provide a detailed tracking report of the programs each of its customers participate in. In order for the IDSM initiative to be evaluated and for SCG to effectively market programs to its customers, it needs to develop a fully integrated database that allows staff and evaluators to look up all programs that customers are participating in at the site ID and/or account level. The CPUC should consider developing a list of variables that each IOU should track in this database to ensure that each of the utilities maintains standardized records with regard to IDSM.

6

Conclusions and Recommendations

This section presents the conclusions and recommendations from the IDSM process evaluation of PG&E, SCE, SDG&E, and SCG. Each utility's personnel were interviewed on areas and subjects impacted by the CPUC's Energy Efficiency Long-Term Strategic Plan's goal directing the IOUs to integrate their energy efficiency (EE), demand response (DR), advanced metering, and distributed generation (DG) programs. The findings presented in this section highlight the results presented in the utility-specific sections.

Each of the utilities has experienced some successes as they strive to integrate their DSM practices. Specific successes for each utility are highlighted below. This list is clearly not exhaustive; rather, it lists activities that were highlighted during the personnel interviews.

PG&E

- Account Executives are actively promoting integration as demonstrated by the 88 integrated projects completed in 2009-2011 (most of them for large Commercial, Industrial, and Agricultural customers and school districts).
- An outstanding IDSM training program included two off-site trainings, and is open to third-party implementers, contractors, and government partnerships. The training also offers in-home training for personnel that were unable to make the larger training sessions.
- PG&E successfully integrated its Energy Savings Assistance Program with its SmartAC program. Energy Savings Assistance Program contractors are educating customers and signing them up to participate in the SmartAC program.
- Implementation of an integrated residential audit tool that provides audit suggestions incorporating EE, DG, DR, and AMI-enabled programs. The tools incorporate customer hourly load data.
- Continued challenges with integrating marketing budgets to support IDSM. The current IDSM marketing budget is limited to covering market research projects and some promotional displays. The nonresidential program team, however, provides substantial support using their program budgets to develop IDSM collateral material. The residential programs do not provide the same level of support. It is also a challenge for the marketing team to pool marketing funds from the DR and DG teams due to funding silos.

- PG&E's current methods of tracking IDSM accomplishments are unsophisticated. PG&E has sophisticated tracking for EE, DR, and DG. However, their only method of tracking the interrelations of how many of these elements a single customer may participate in is via individual tracking by account reps that are added to the IDSM quarterly reporting spreadsheet. There are no reports or analysis conduct on this data to determine if there are any customer patterns, relationships, project timelines, etc. that can help inform the account team or program teams on how to further integration across IDSM elements across customer segments.

SCE

- Account managers are actively promoting integration as demonstrated by the 78 integrated projects completed 2009-2011.
- The Office of the Future program has proven the value of a system-wide approach to retrofitting the lighting systems in offices.
- On-going implementation of a new data management system that will improve the utility's ability to track projects and integrated projects.
- Implementation of an integrated residential audit tool that provides audit suggestions incorporating EE, DG, DR, and AMI-enabled programs.

SDG&E

- The Local Island program provided customers with a single point of contact for EE, DR, and DG, helping to ease customer participation in multiple programs for a more integrated DSM experience.
- SDG&E has implemented an integrated residential audit tool that provides audit suggestions incorporating EE, DG, DR, and AMI enabled programs. The tools incorporate customer hourly load data.
- SDG&E's Segment Advisors are responsible for being informed of all the DSM strategies that would help customers in their segment better manage their energy. In fact, the position is unique to Sempra. Segment Advisors are able to focus on one segment and integrate DSM for those customers specifically.
- SDG&E currently tracks EE, DR, and DG participation but has no means to easily track the integration of DSM at a site. Account representatives are tracking integration individually. This methodology leads to lost knowledge and information when individuals change jobs. A method to integrate participant tracking databases is needed.
- After SDG&E's IDSM training, attendees completed a post-workshop survey in which they were asked to identify barriers to IDSM. The top barriers that were listed include

internal silos/communication (61%), budgets and funding (54%), and CPUC/regulatory policy (35%).

SCG

- SCG and SCE have developed a good working relationship to make sure their low income customers benefit from natural gas and electricity low income programs.
- SCG has developed relationships with water utilities to not only reduce use of water but also natural gas used to heat water.

6.1 Knowledge Enhancement and Training

All utilities provided the evaluation team with data, slides and marketing material highlighting the IDSM training and knowledge enhancement undertaken at their utilities. Individual personnel were also questioned about their understanding of the concepts, goals, and resources available to facilitate the delivery of integrated solutions. Personnel from all of the utilities appear to understand that integrated DSM includes providing the customer with a holistic solution to their energy needs that includes EE, DR, and DG. At SCE and SDG&E, some personnel initially defined IDSM as the combination of EE and DR, either leaving DG out or relegating it to a lesser place in the combination of DSM options. At SCG, definitions of IDSM tended to focus on EE and integrating with other utilities (SCE or water utilities) and other types of programs (low income programs).

Each of the four utilities provided IDSM training for its personnel. The interviewed personnel felt that the training was informative, but many of the more experienced personnel felt that they were already knowledgeable about IDSM. The IDSM training at SCE, SCG, and SDG&E is newer than PG&E's training. The IDSM training at PG&E has been on-going since 2010, is offered at two locations, and is a two-day event where the attendees can choose from multiple tracks of concurrent sessions. The training provided by PG&E is open to both internal- and external-facing staff including: account representatives, business solutions phone representatives, third parties, LGPs, and contractors; and program and program support staff. PG&E staff that missed the off-site training can attend one of several make-up sessions. SDG&E also offered a make-up session to those staff members who missed the initial half-day training session.

Enhancing the knowledge of personnel about the IDSM goals and the available resources has also led to utility personnel having the perception that regulatory barriers limit a more complete DSM integration. Perceived regulatory barriers include funding silos, regulatory policy, and different funding cycles. Additional IDSM barriers to mention by interviewed personnel include IOU internal communications and integration with DG.

6.1.1 Knowledge Enhancement and Training Conclusions

- Each of the IOUs has developed comprehensive training material and training sessions. The IOUs are sharing training practices and approaches. The current training that is available, however, is more advanced at PG&E than at the other IOUs. PG&E has extended IDSM training to its third-party implementers, contractors, and government partnerships to make sure they are aware of PG&E's IDSM strategies.
- The personnel interviewed for this evaluation were generally knowledgeable about IDSM. The personnel interviewed generally included EE and DR in their definition of IDSM. DG was frequently included in the definition of IDSM.
- The role that AMI plays in IDSM was not always clear. Few personnel included the AMI-enabled programs in their definition of IDSM.
- SCG personnel interviewed for this evaluation understood IDSM to be the presentation of the comprehensive solutions that helps SCG customers reduce their energy use. Due to their single fuel delivery, however, integration training at SCG generally focused on integration across EE programs.
- IDSM training has raised awareness and perceptions of regulatory barriers that limit a more complete integration due to separate funding streams and timelines.

6.1.2 Knowledge Enhancement and Training Recommendations

- The CPUC should consider using PG&E's model for IDSM training as an example for the other IOUs.
 - Training should occur at least yearly.
 - Training should be made available to third-party implementers, contractors, and government partnerships to help ensure that these organizations are aware of IDSM goal, material, and strategies.
 - In-house make-up training sessions for those who miss the larger meetings should be available.
 - The creation of IDSM training videos would provide an opportunity for those who miss the training to acquire the information on their time-line and it would provide other who attended the training to view updates when they felt the need.
 - Each training session should highlight new approaches or tools that facilitate the delivery of integrated programs to ensure that more experienced personnel are engaged and learning about IDSM.
- SCE and SCG should consider offering either a joint training or provide a trainer or additional information for each other's training workshops to facilitate integration across programs offered by these two single fuel utilities.

- The IOUs need to develop better communication and knowledge between EE and DR and their DG programs. The IDSM training needs to clearly incorporate DG and provide insights into how DG can be incorporated into EE and DR projects.
- IDSM training needs to incorporate more information on AMI-enabled programs and explain how these programs can be integrated with EE, DR, and DG programs for their customers.

6.2 Integrated Pilots

The implementation of integrated pilot programs is one of the strategies described in the California Long Term Energy Efficiency Strategic Plan to pursue IDSM. As part of their 2010-2012 portfolios, the IOUs were instructed to consider the development of pilot programs to inform future policy and program submissions regarding integration best practices, offer bundled products that include elements of EE consumer generation, DR, and the best available AMI technology, and offer different forms of delivery (including third party and local government platforms) and information access. The 2010-2012 Implementation Goals states the following: “Propose and launch program delivery pilots testing capabilities and effectiveness in the marketplace, including: EE, DR, AMI, and DG.”

During IDSM Task Force meetings, representatives of the IOUs have stated that the integrated pilots are not the best place to see integration at the utilities. Task Force representatives often expressed the belief that account representatives for larger customers represent the best on-going integration at the utilities. Relying on account representatives to deliver integration, however, focuses on only a small share of utility customers and it has not led to the development of integrated savings and cost data. The CPUC was looking for the pilots to provide information necessary to help develop inputs for a cost-effectiveness approach and an evaluation framework. The existing integrated pilots have generally provided little information that will help develop cost-effectiveness inputs or an evaluation framework. Many of the existing pilots, however, have facilitated integration. Many of the existing pilots have been hampered by the recent slow economy and may see greater activity when the economy rebounds.

PG&E’s SmartAC/ESAP Pilot bundled DR with EE so effectively that it has progressed to the program phase. In the future, this program may present the opportunity for conducting an assessment of the cost-effectiveness of integration across EE and DR for low income residential customers. PG&E’s Green Communities and Zero Net Energy (ZNE) Pilots may provide this information in the future, but are too early in their development and implementation to have integrated projects to evaluate.

SCE has several integrated pilots, but some of the pilots had late starts and others are just now launching RFPs or beginning roll-out. According to the 2011 Annual Report, however, the

Sustainable Communities Pilot has reported significant progress in building ZNE homes (45 homes). Information on costs and savings for these homes may help provide data needed to evaluate ZNE efforts in the future. In addition, the California Advanced Homes and the New Solar Homes Partnership are working to bundle EE and DR or DG into residential new construction.

The Local Island Pilot in Borrego Springs and the Local Sustainable Communities Pilot are SDG&E's two integrated pilots. The Local Island Pilot is using home energy audits and free non-residential integrated audits to determine the appropriated EE, DR, and DG projects for customers. Customers are provided a single point of contact for all energy solutions and a "bonus" incentive based on their progress toward ZNE. The isolated nature of the Local Island's Pilot, however, may limit its adaptability to other geographies. The Local Sustainable Communities Pilot was initially launched in conjunction with SCG but it stalled due to difficulties finding a developer. Both SDG&E and SCG have separately found developers and are both in the beginning phases of development planned to cover 20 years.

6.2.1 Integrated Pilot Conclusions

- The IOUs have clearly indicated that they do not believe that integrated pilots are the best place to observe their integration efforts. The IOUs believe that integration is being advanced by commercial and industrial account executives.
- The current set of integrated pilots being implemented by the IOUs may facilitate integration, but they are not generally designed with integration as their primary focus. They are not currently designed to be the test bed to develop information on the added benefits and costs or barriers associated with integration.
- PG&E has shown success in its initial coordination between the SmartAC (DR) program and the Energy Savings Assistance Program. This pilot is advancing to the program stage. Providing a single point of contact for customers to integrate DR and EE programs has led to many integrated projects.
- The SDG&E Local Island's pilot program successfully encouraged residential and small commercial customers to participate in multiple types of DSM. The project manager attributes the pilot's success to presenting the customer with a single point of contact for all the energy solutions available, whether it is related to EE, DR, or DG.
- The complexities of integration highlight the importance of customers having a single point of contact for EE, DR, DG, and AMI-enabled programs. Large commercial and industrial customers have this with account representatives. PG&E's Energy Savings Assistance Program/SmartAC combination, the Resource Energy Manager in SCE's Food Processing Pilot and the local contact in SDG&E's Local Island Pilot provided a single point of contact for small commercial and residential customers leading to increased integration.

- Pilots reliant on new construction have been delayed due to setbacks in the economy and the slow recovery in the construction sector.

6.2.2 Integrated Pilot Recommendations

- Given the success PG&E has experienced with the delivery model of having HVAC contractors explain and sign customers up for SmartAC, PG&E and the other IOUs should consider bundling AC cycling programs with the Energy Savings Assistance Program (ESAP) and other residential HVAC programs.
 - The CPUC should conduct an evaluability assessment to determine if the SmartAC/ESAP pilot presents an opportunity to assess the cost-effectiveness of bundling an EE program with a DR program.
 - The combined delivery of the SmartAC (DR) and ESAP (EE) program should be evaluated to determine if it can be used as a test bed for evaluating an IDSM program. The evaluation could be undertaken as part of the ESAP program.
- The CPUC should consider modifying the reservation period for EE and DG to ensure consistency and that new construction projects can reserve these funds without concerns that differential reservation periods may limit the ability to bundle these types of DSM.
- The CPUC should request that the IOUs commit to designing and implementing integrated pilots or programs that provide the retrofit residential and small and medium commercial customers with an opportunity to implement an integrated bundle with a single point of contact.
 - The SmartAC/ESAP combination provides a good example that could be expanded upon, using the ESAP contractor to also provide information on AMI-enabled programs such as peak time rebate and usage notification programs. The resource energy manager that is currently being tried in SCE's Food Processing Pilot could be tried in other small and medium commercial businesses.
- The CPUC should align or more closely align the funding cycles for EE, DR, DG, and low income programs. Non-aligned cycles are a barrier to integration.
- PG&E's IDSM team should begin including metrics on the status of Climate Action Plans (i.e., initiated, completed, and integrated) and any potential energy and GHG savings that may be addressed in the CAP as part of their quarterly reports.
- Both the California New Homes Program and the New Solar Homes Partnership require that new construction be at least 15% more energy efficient than Title 24 to receive incentives. As more DR technologies become enabled for the home, both Programs should include incentives for DR and possibly be merged into one Program to increase efficiency and reduce redundant administrative costs.

6.3 Emerging Technology

The Strategic Plan calls for the prioritization of integration-enabling technologies in Emerging Technology (ET) programs. A member of the ET program was interviewed at each IOU.¹ ET personnel were questioned about the technologies reviewed as part of their integration efforts and they were questioned about important successes and barriers that need to be overcome. Common themes that emerge from the ET interviews include barriers associated with finding funds to identify DG technologies that offer integration opportunities, the increased costs of integrated technologies, the increased savings potential of these technologies, and the reduced DR potential associated with technologies that bundle EE and DR.

6.3.1 Emerging Technologies Conclusions

- The concept of integration and the desire of ET personnel to evaluate technologies and systems with integration potential is well developed in the IOUs.
- The current ET integration efforts do not appear to incorporate distributed generation technologies. It is also not clear that the ET program is integrating AMI web-enabled technologies and their integration potential into their evaluations.
- The Office of the Future is an exciting and promising area of research, and SCE's leadership of the consortium has placed it and California in the forefront of national R&D into how to drive down energy costs and consumption in this important sector.

6.3.2 Emerging Technologies Recommendations

- The ET programs should continue to study the integrated systems approach to implementing EE and DR. Where possible, this approach should attempt to incorporate DG and AMI-enabled technologies.
- The IOUs and the CPUC should continue to assist each other to find resources to support research on the assessment of DG technologies with integration opportunities. The different funding cycles and current EE guidelines that limit the use of EE funds for DG activities should be reviewed as they may be limiting the analysis of DG technologies within the ET program.
 - If funding is available, the IOUs should continue to use the Business Incubation Program to support DG technologies.

¹ SDG&E and SCG have a joint Sempra ET group; therefore, the PM of this group was interviewed for both utilities.

6.4 Integrated Audits

During the 2010-2012 program cycle the CPUC directed the IOUs to develop standardized integrated statewide audits and survey tool portfolios that will customize energy saving recommendations based upon customer profiles, operating characteristics, market sector potential, and cost-effectiveness. The integrated audit tools have been developed by the four IOUs. Each IOU chose to use a different contractor to develop and implement its on-line audit tool.² The use of three different contractors to develop the tool worked to ensure that the software developed would integrate with the software, hardware, and programs offered by the different utilities, but it has also led to tools with significantly different approaches to implementation and use of the vast AMI data.

6.4.1 Integrated Audit Conclusions

- Close communications between the CPUC, IOUs, and their vendors has led to the development of three integrated audit tools that meet the requirements set out by the CPUC. SCG's tool is under development and will be available later this year.
- According to the interviewees, the SDG&E and PG&E on-line integrated audit tools actively incorporate the customer's energy usage data collected from the smart meters. SCE's tool does not incorporate the customer's energy usage data, opting to use a set of average values. SCE will update their tool to actively incorporate the energy usage data collected from the smart meters, but as of this evaluation, the SCE tool does not incorporate individual load data. SCG has not installed advanced meters yet, but it plans to do so and to incorporate these data into its integrated audit tool.
- The residential integrated audit tools make recommendations for EE, DG, AC cycling, and participation in peak time rebate programs. The tools also encourage participation in web enabled programs. The integrated audit tool is one of the few places where EE, DG, DR, and AMI tools are truly integrated.

6.4.2 Integrated Audit Recommendations

- The integrated audit tools allow customers to update their information over time. This feature allows for ongoing interaction that may lead to continuous upgrading of measures and behavior by some customers.
 - The original audit recommendations, customer updates, and customer usage data should be evaluated to determine the potential influence of these features on customer usage patterns.
 - The audit recommendations and customer update information should be combined with the program tracking data to determine the impact of audit recommendations on

² SDG&E and SCG both used Aclara since this is the vendor who designed their websites.

future program participation and the adoption of energy efficiency measures outside the program.

- The CPUC and IOUs should consider evaluating the recommendations and the estimated savings values provided by the integrated audit tool. Some of the IOUs expressed concern that the tools were not sufficiently geographically specific and that they may be providing savings values that were incorrect for California.
- Currently, there is no link between the on-line audit recommendations and the IOU program tracking data. Establishing this type of link would facilitate the evaluation of the audits success and where recommendations are not being adopted and it would help individuals better understand their opportunities when they re-enter the tool.

6.5 Account Executives

The role of an account executive is to examine each of its designated customer's energy usage and needs and provide them with the appropriate combination of energy savings recommendations while taking into account the cost-effectiveness of the solutions they present. Account executives for large commercial, industrial, and agricultural customers provide a single point of contact for their customers to provide information on EE, DR, and DG programs. Account executives can provide their customers with an integrated solution from the distinct programs offered by the IOUs.

For this evaluation account executives were questioned about the resources made available to better offer integrated programs, they were questioned about the internal and external programs with which they develop integrated solutions and about their integration successes and challenges. The account managers were also questioned about marketing, tracking, incentives, and the application process. Some of the findings and recommendations derived from these questions will be presented here and some are presented in later sub-sections.

6.5.1 Account Executives Conclusions

- The IOU account representatives seem well-informed and motivated to pursue integrated projects.
- Account executives are unimpressed with the application process.
 - Inputting the application for an integrated project is time consuming.
 - When the integrated project is in the system it often become separated into the distinct DSM measures, with the timeline for review and funding differing across the different types of DSM. The separation of the integrated project can lead to timing and funding delays.

- Each IOU should develop a review process to ensure that integrated projects are not separated within the application process or the account executive should have the ability to easily view the progress of the integrated application to better shepherd it through the different review stages.
- The IOUs and the CPUC need to work to develop an integrated application.
- The funding cycles for EE, DR, and DG need to be better aligned.
- SCE should determine if the new CRM system can be used to help integrate the application process across multiple types of DSM. The other IOUs should review their application and tracking systems to ensure that they are streamlined and integrated.
- The Continuous Energy Improvement, TA/TI, and DR programs generally were listed as programs that are commonly included in integrated projects.
 - These programs were developed as programs that facilitate integration by design. The success of these programs should be used to facilitate the development of new integration facilitating programs.
- Account executives state that they track the projects that they offer and that their customers implement. The account executives state that they are aware of EE and DR tracking data at the utilities. Note, however, that not all account executives are aware of DG tracking databases. None of the account executives interviewed for this evaluation had attempted to track the various DSM projects installed by their customers using their utility's tracking data.
 - The lack of integrated tracking is leading to a lost opportunity to develop information on integrated costs and to develop integrated savings estimates.
 - The lack of integrated tracking is a barrier to better integrated program development. An integrated tracking database could be analyzed to determine sectors, segments and geography where integration is more successful. The data could also be analyzed to determine programs frequently implemented in integrated projects.
- Newer account executives could benefit from additional mentoring on integration. The mentoring should include newer executives accompanying a more experienced account executive on an integrated project presentation.

6.5.2 Account Executives Recommendations

- The development of a bottom up integrated tracking methodology is needed to better understand what account executives are offering and what their customers are implementing.

- An integrated tracking database is needed to better understand the places where integration is occurring and to understand what types of integration are occurring where.
- The IOUs should work to develop integrated programs and/or integrated pilots. Instead of having piecemeal programs that only reward individual steps, the installation of single measures, or the adoption of an individual type of DSM, the IOUs should create programs or pilots that explicitly require two or more DSM offerings in order to receive the full rebate.
 - The CPUC should review the cost-effectiveness of providing integrated projects with a bonus or higher incentive value.
- Account executives currently have kWh, therm, and kW goals. The IOUs should look into providing the account executives with an integrated project goal. Progress toward achieving the goal should be tracked and rewarded.
- The CPUC and the IOUs should discuss the possibility of developing an RFP for an integrated potential study to better understand the quantity of IDSM potential and to determine the segments where this potential exists.
 - The study could be informed by the existing potential studies.
 - The interactive effects of EE and DR, however, limit the ability to directly use the existing studies to develop a quick estimate of IDSM potential.
 - The lack of currently available information on the costs incurred and savings achieved from integrated projects may significantly increase the uncertainty associated with an integrated potential study.
- To further encourage integration, the CPUC and IOUs may want to work together to develop integration targets.
 - The development of integration targets requires the development of integrated tracking of projects and their demand and energy savings. The CPUC, IOUs and third-party evaluators must know the types and quantity of DSM impacting a site.

6.6 Integrated Marketing

The California Long Term Energy Efficiency Strategic Plan lists Comprehensive and Coordinated Marketing as the first of the three levels of integration for DSM options. Coordinated DSM Marketing is also listed as one of the four overarching strategies for DSM integration in the Strategic Plan. Integrated marketing should inform the customer of their DSM options in a unified fashion so that customers can receive coordinated information on EE, DR, DG, and AMI facilitated programs with a minimum of effort.

The evaluation team interviewed members of the marketing group at each IOU. The marketing team was questioned about their definition of integrated marketing and outreach. They were asked to explain the integrated message that they were trying to get across to the customer. The marketing interviewees were asked to describe the process of developing integrated marketing material and to indicate if they thought that they were effectively communicating an integrated message to their customer.

6.6.1 Marketing Conclusions

- The marketing teams at each of the utilities understand the importance of providing integrated marketing to their customers.
- IDSM marketing collateral appears to face challenges due to the way it is funded. It is funded largely through DR and EE funding, and each Program Manager wants his/her program to be featured rather than offering an integrated message across several programs.
- DG options were not highlighted by the marketing personnel and they play a secondary role in integrated marketing.

6.6.2 Marketing Recommendations

- A mechanism needs to be developed to ensure funding for integrated marketing. This could be established through the development of a specific, separate funding source; alternatively the barriers that currently exist to funding through EE, DR, and DG could be reduced.
 - The barriers to funding integrated marketing that includes DG need to be eliminated.
- The CPUC and IOUs should undertake a study (primary or secondary research on existing data) that focuses on identifying what is the baseline understanding of IDSM among consumers and then determine what the underlying value proposition is where the team can concentrate on educating the customer. The study results can help support developing a campaign that focuses on building a base case to educate customers about IDSM.
 - The study results from each utility should be shared with the other utilities to ensure that each utility has the opportunity to learn from the other's successes.
- The CPUC and the IOUs should work together to determine the effectiveness of integrated marketing material.
 - Customer surveys should be fielded to determine the effectiveness of alternative marketing approaches.

- The general findings from these surveys should be shared across IOUs to facilitate the development of best practices, compare the effectiveness of alternative types and sources of integrated marketing and to efficiently develop new information.

6.7 AMI and Integration

The installation of smart meters facilitates the integration of DSM options. AMI has facilitated the development of a variety of integrated pilots and emerging technologies (Home Area Networks, the coordination of EE programs with AC cycling and web presentment) and has led to the development of web tools that allow customers to better monitor their energy usage, understand the cost of energy, and provide behavioral messages and links to utility DSM programs that are designed to reduce consumption. As part of this evaluation, members of the AMI team were interviewed, information was provided on AMI-enabled web tools, and other utility personnel were questioned about how the AMI tools were being integrated with their program or with the options they present to their customers.

6.7.1 AMI and Integration Conclusions

- Smart Meters and the web tools have allowed customers to have more information about their usage and how their usage impacts the cost of their electricity.
- The AMI web tools are facilitating customer enrollment in Peak Time Rebate, AC Cycling, and behavioral programs. Interviewees working on the residential audit tool and in the AMI group are very aware of how the AMI tools are facilitating integration with these programs.
 - The web presentment is in various stages of development. The tools should lead users to increase their participation in other DSM programs including EE programs, the integrated audit, and DR and DG programs.
- Smart meter-enabled technologies have been incorporated into some integrated pilots and programs.
 - The IOUs have begun to integrate the Energy Savings Assistance Program with the web-enabled tools to help encourage greater understanding of usage and costs among participants.
- PG&E and SDG&E have integrated the AMI provided usage information into their on-line audit tools to help their customers better manage their energy costs. SCE will be adding this feature shortly.
- The utilities are using the AMI-provided usage information in HAN pilots. The initial HAN pilot is completed at SDG&E and on-going at other utilities.

- The initial pilot results indicate that more education is needed surrounding residential pricing or PTR programs to ensure that customers understand the objectives, rewards, and how to best actively participate in these programs.
- The Home Area Network (HAN) pilots are also hampered by the current lack of messaging enabled appliances that link with the HAN. The success and drawbacks of these equipments are yet to be determined.
- The IOUs should be reporting SmartMeter Activities that can enhance integration as part of the IDSM quarterly report.

6.7.2 AMI and Integration Recommendations

- The IOUs and the utilities should fund research to evaluate the influence of web tool participation on the development of integrated solutions by residential and small commercial customers.
- The utilities must ensure that the Energy Savings Assistance Program contractors are providing their customers with adequate information on the AMI enabled web tools. Customer surveys should be implemented to monitor the understanding of this hard to reach sub-group to ensure that the contractors are providing the customers with adequate accurate information.
- Given that the initial pilot for HAN indicates that additional education is needed to inform customers about pricing and PTR programs, the IOU should develop additional marketing and education information about these programs.
 - The IOUs should survey their HAN and PTR customers to determine their understanding of the technology, the prices. The education material should be developed based on the information gained from the surveys.
- The integration opportunities provided by the AMI-enabled web tools should be highlighted in future integration knowledge enhancement sessions.
- The successful integration of AMI-enabled web tools with existing residential programs should be highlighted in future integration knowledge enhancement sessions.
- The successful integration of AMI-enabled web tools with existing residential programs should be reviewed. This integration uses the implementation contractor to provide the customer with information, and potentially enroll the customer in web enabled tools. The IOUs should consider using a similar approach with other contractor implemented programs.
- A member of the AMI SmartMeter education and deployment team should be added to each utility's IDSM Task Force to ensure increased and on-going communication between Task Force members and the AMI team.

- The AMI SmartMeter team should provide the IDSM Task Force with updates on enhancements to the SmartMeter web presentment. The EE, DR, and DG programs should work with the SmartMeter team to ensure that appropriate program information is provided on the web portal to encourage program participation and program integration.
 - Easy click through from recommendation pages to enrollment pages would encourage enrollment.

6.8 Integrated Reporting

One of the key goals of the CPUC IDSM Task Force is to assess the effectiveness in terms of energy savings and costs for implementing IDSM. To do so, the Task Force will need to have access to project accomplishments and estimated project savings and implementation costs across all integrated elements (EE, DR, DG and AMI) across projects and programs. At this time the IOUs track EE and DR across programs and projects within their tracking systems. Other DSM efforts, (DG, ZNE, SmartAC) and integrated projects are often tracked in separate spreadsheets by the various program leads. Not having access to detailed program information across all IDSM efforts impedes the ability of the CPUC, IOUs and third-party evaluators to take a comprehensive view of integration effectiveness.

The evaluation of IDSM efforts requires an integrated database across all DSM efforts, including EE, DR, DG, ESAP, and AMI-enabled programs. Tracking of all DSM efforts is necessary. The integration of electronic databases with this tracking information across DSM efforts may be complicated for larger customers, but it is necessary to evaluate the impacts and costs of integrated projects. In addition, as the number of customers choosing to participate in multiple forms of DSM increases, it will become increasingly difficult for the EE, DR, DG, and AMI evaluation to correctly attribute program impacts without an integrated database.

6.8.1 Integrated Reporting Comments

- Account Executives currently track their customer's implementation of EE, DR, and DG. Account Executives understand the importance of recording and referencing previous recommendations and installation when they approach a customer with new recommendations.
- Many Program Managers track the accomplishments of their own programs but they do not track, nor often have interest in, the programs that their customers commonly coordinate.
- SCE has recently invested in a new SAP-driven enterprise management system. While it is not clear from information gathered during this evaluation that the system has access to DG program participation, the system apparently has access to EE and DR data.

- SCE should provide more training for the account executives on how to access key data in the system, such as status of projects, should be considered. The account executives interviewed for this evaluation reported difficulties using the new system
- Reports for integrated projects combining EE with DR or DG should be created.
- Reports indicating the business types most commonly participating in integrated project should be created.

6.8.2 Integrated Reporting Recommendations

- The CPUC IDSM Task Force and IOUs should collaborate on identifying key metrics that are needed to determine energy savings and costs for the respective IDSM area. They should begin by looking closely at what reporting metrics each DSM area is currently collecting (i.e., site information, customer information, measures installed, installation dates, measures replaced, baseline practices, measure/installation costs, expected energy and peak savings, EUL, etc.). Once all metrics currently collected are identified, staff/evaluators can work with the IOUs to determine gaps and an approach for collecting any missing key variables.
- The IOUs should provide detailed plans on how they will produce integrated tracking reports on all IDSM projects that include comprehensive metrics on energy savings, costs, etc. at the project and program level across all IDSM areas. This report will need to expand beyond the project tracking from the account representatives to include both res and nonresidential customers and expected savings.
- PG&E and the Sempra utilities need to look into the possibility of developing a new data management system that will enable the tracking of integrated projects including EE, DR, and DG.
- The IOUs should begin disseminating regular reports internally from the tracking system (and other sources) to raise awareness of what projects are most commonly used for integration. That is, reports should indicate whether the customer is looking into adding any other areas of DSM to the existing project (i.e., for solar customers, should indicate what EE elements came up during the audit and when to expect installation of EE improvements).
 - At utilities where the current tracking system effectively tracks EE and DR, an integration of these two systems should provide information on the EE and DR programs that are currently commonly used for integration. The combined EE and DR database will also provide information on the business types that are currently participating in both EE and DR programs.

6.9 Key Recommendations

The key recommendations from this report are designed to help the IOUs and the CPUC improve their understanding, implementation, and tracking of IDSM. The evaluation team recommends that each IOU study the conclusions and recommendations for their utility and for the three other utilities evaluated for this study. Reviewing what the evaluation team has found to be successful at the other IOUs will help the 4 IOUs learn from the other's successes. Using this approach, the IOUs will be able to develop and implement best practices in the new field of integrated DSM.

The evaluation team also recommends that the IOUs and the CPUC work together to decrease the funding and regulatory barriers to integration. Eliminating the siloed nature of traditional DSM will take time and the commitment of the utilities, the CPUC, and third party implementers.

The process evaluation developed an extensive list of recommendations. The following is a short list of the key recommendations.

- ***SCE, SDG&E, and SCG should coordinate with PG&E, reviewing PG&E's training and incorporate aspects that are appropriate for their utilities.*** PG&E's IDSM training and knowledge enhancement program is more extensive than the IDSM training offered by the other IOUs.
- ***The CPUC should provide the IOUs with a concise definition of IDSM.*** During the course of the evaluation the definition of integration was a subject of discussion. The IOUs have included the integration of low income programs with moderate income programs as a form of integrated DSM. The combination of low and middle income programs may be an efficient use of resources, but it is not clear that it is IDSM.
- ***The IOUs should work to develop a tracking system that will simplify the integration of program participation information.*** The utilities do not currently track program participation across EE, DR, and DG in a way that allows account executives, program managers, or evaluators to easily determine participation in multiple types of DSM at a site or within a project.
 - The information in an integrated tracking system should be analyzed to determine the sectors and segments that are currently implementing integrated projects. This information should be used to help focus future integration efforts.
 - An integrated tracking system would provide utility personnel and evaluators a clearer picture of how much integration across EE, DR, and DG has taken place to date and what potential integration opportunities still exist. This is a barrier to further progress towards an assessment of IDSM.

- ***The IDSM Task Force and integration groups within the utilities should include representatives from AMI enabled programs, including behavioral and rate based programs.*** Integrating AMI enabled programs with EE programs may be an effective pathway to integration for residential and small commercial customers.
- ***The IOUs and the CPUC should discuss the development of integration goals.*** Goals could be based on savings targets or the number of integrated projects.
 - Verifying the attainment of integration goals would require the development of either an integrated tracking database or separate databases that are easily integrated.
 - Integration goals could help compensate for the lower DR savings available from an integrated EE/DR site.
- ***The CPUC should consider the development of a reliable DG funding source.*** Integration with DG has been hampered by the lack of DG funds. By providing reliable funding for DG technologies for the purpose of integration, the utilities will have more flexibility to include DG in its integrated pilots and integrated emerging technologies projects going forward. DG has not been integrated fully by the utilities, at least in part, because of the barriers to funding.
- ***The IOUs should work to develop programs and Pilots with integration as a central objective.*** These types of programs and Pilots should provide customers with a single point of contact for multiple types of DSM, an attribute that has been found to facilitate customer understanding of DSM.
- ***If the CPUC does not develop integration goals, the IOUs should develop internal integration goals for programs and/or types of DSM.*** The integration goals would be an added encouragement to pursue integrated projects.
- ***The IOUs and the CPUC should consider the development of a new incentive or financing mechanism for integrated projects and technologies.*** Integrated projects and technologies often have a higher upfront cost. Rebate adjustments or financing options may need to be developed to overcome this barrier.
- ***The IOUs should develop integrated programs.*** Integrated programs would provide a single point of contact for customers, eliminate barriers associated with different planning and funding cycles, and lead to the natural development of integrated rebates.
- ***The IOUs and the CPUC should discuss ways to limit the negative influence of different funding cycles and reservation periods on integrated projects.*** Integrated projects work across multiply types of DSM and multiple funding cycles. Different funding cycles and reservation periods is a barrier to integration.
- ***The IOUs need to develop integrated programs designed to influence new construction design at its earliest phase.*** Integrated designs often incorporated elements that must be considered at the initial phases of new construction design. The IOUs must work with designers and architects to inform them of IDSM goals, potential, and utility programs.

- ***The IOUs should develop integrated training and outreach for third party implementers.*** A current barrier to integration is the lack of third party implementers with cross program missions and skills. Training and outreach by the IOUs on the goal of integration, combined with programs and projects requiring integrated contracting skills, will lead to the development of new skill sets among third party implementers.