Encouraging Innovation in the Third Party Initiative Program

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Executive Summary

This report provides a review and assessment of alternative organizational and programmatic designs that can be used to solicit innovative proposals in the delivery of energy efficiency services. Specifically, this report is intended to serve as a supplement to the evaluation of the Third Party Initiatives (TPI) program implemented by the California Board for Energy Efficiency (CBEE)

A **review of literature** on promoting innovation through solicitation processes pointed to a general lack of discussion on this topic. There is, however, an enormous amount of literature available on the general topic of innovation. Two areas are particularly relevant to this report: (1) innovation in government, and (2) the concept of parallel organizations. This latter issue appears to have considerable relevance to the TPI program experience as the future role and mission of the program is clarified further in PY99.

A **review** of grant-making approaches within the **private foundation** community was undertaken to identify salient innovation-promoting attributes within the solicitation processes used by these organizations. Perhaps the most prominent theme to emerge from this case study is the contrast between internally and externally focused grant-making. Internally focused grant-making is self-directed and pursues ideas that are shaped largely within the organization. Externally focused grant-making actively solicits ideas that are shaped in large measure outside the organization. Both grant-making approaches can result in innovative ideas and projects, but the internally focused approach requires creative leadership from within and should be complemented by external peer review. The externally focused organization must be open to the "unexpectedly good" or innovative idea. Its questions must also reach the proper audience, which might lie beyond the foundation's core grantees. The internally focused organization is perhaps better positioned to more broadly implement ideas that have been tested elsewhere. The externally focused organization may be better suited to explore those ideas that will become tomorrow's proven approach. Of course, an organization could have elements of both styles; each of the foundations considered for this case study combine, in varying proportions, both grant-making styles.

A **review of public-sector initiatives** was also undertaken to identify common success factors in promoting innovation. Mission statements play a crucial role in public-sector initiatives. Many organizations have established program and sub-program areas, the composition of which reflects this mission and external influences. Solicitations frequently employ some variation on a two-stage process — a process that first solicits broad ideas and then pursues specific proposals. Such a process helps organizations focus externally and, in the case of commercialization, understand the market. The use of selection criteria varies; however, one of the primary advantages of a well-articulated set of criteria is increased potential for alignment of proposers' and sponsors' goals. Organizations are generally capable of tailoring their level of involvement in a project to ensure the ultimate success of the project. In the case of NYSERDA, the organization effectively becomes a business partner with the grant recipient, thereby ensuring a mutually beneficial relationship. Evaluation is widely used, reflecting a general demand for project performance that was also highlighted within the foundation community.

An assessment of **alternative program models for TPI** highlighted a number of recommendations that may be considered in modifying the program to solicit innovative energy service concepts, including:

- Establish a strategic mission for the TPI program
- Establish whether TPI is to be a “replacement organization” or an “innovation incubator”
- Clarify whether the intent is to be internally or externally focused, or both
- Establish a consistent time horizon for the organization and projects that are funded
- Implement an annual planning process to establish program areas
- Consider utilizing non-traditional program area definitions
- Establish a panel of experts to comprise program-level steering committees
- Develop a communications and out-reach plan that will maximize the exposure of all solicitations
- Implement a two-stage solicitation process
- Insist on measurable outcomes and a clear articulation of strategy
- Use expert panels in the technical review of proposals
- Publish technical criteria upon which proposals will be evaluated
- Encourage the requirement of significant matching funds in all projects

1. Introduction / Background

This report is a supplement to the evaluation of the Third Party Initiative Program (TPI). The authors were asked to investigate other organizations that seek innovative ideas, products, or services via the Requests for Proposal (RFP) process to determine what aspects of those programs might be applicable to TPI. We also investigated several energy efficiency programs in other states that could serve as models for the operation of TPI. The following tasks were completed for this project.

- A literature review focus on innovation and grant-making.
- In-depth interviews with three private foundations known for promoting innovative ideas: The Pew Charitable Trusts, The Annie E. Casey Foundation, and the F.B. Heron Foundation.
- In-depth interviews with three Federal government agencies: The National Science Foundation (NSF) Small Business Innovation Research Program (SBIR), The US Department of Energy (DOE) Inventions and Innovation Program, and The US Department of Transportation Office of Mobility Innovation.
- In-depth interviews with three statewide organizations charged with promoting innovative energy efficiency programs: New York State Energy Research and Development Authority (NYSERDA), The Wisconsin Energy Center (WEC), and Rhode Island Renewable Energy Collaborative (RIREC) / New England Electric System (NEES).

2. Literature Review

The literature on innovation is so vast that using this term in a keyword search is virtually useless. Paul Light in his book, *Sustaining Innovation: Creating Nonprofit and Government Organizations That Innovate Naturally*, noted that his internet search using the word "innovation" produced over 400,000 hits back in 1997. In our review of available literature, it was obviously necessary to focus our attention on areas of innovation that were relevant to this program. For this reason, we focused on two principal areas of research:

- innovation in grant-making and program solicitation, and
- innovation in non-profit and government institutions.

From this perspective TPI can serve as a means to introduce new innovative projects into the existing portfolio of projects, and/or TPI can serve as a competitive alternative or supplement to the current utility-administered program structure.

Innovation in Grant-making or Program Solicitation

A literature search was conducted to determine what had previously been written on the subject of innovation in the area of program solicitation and/or grant-making. A limited number of references were collected using these topic areas as key words. Several of these references actually turned out to be from the Federal Registry where program announcements for the Fulbright Fellowships and several US Department of Transportation RFPs were announced. As a result of these references, we recommended that the US DOT be included as one of our interview targets (Fulbright fellowships seek individuals instead of projects).

Several articles were found on ways that foundations are changing their grant-making. A story in *Foundation News & Commentary (*July-August 1995*)* interviewed three foundation heads about how to introduce innovation into the grant-making process. One respondent noted "Our experience has been that a well-publicized CFP [Call for Proposals] with a clear focus will get beyond the usual cadre of grant-seekers and spark innovative proposals from people who might otherwise not apply for funding." Another article highlighted the changes being made by the Pew Charitable Trusts (Goss, 1990), however, we discuss those changes in more depth in the case study section of this report.

Innovation in Government Institutions

Most of the innovation literature has focused on private industry and, specifically, the innovation of new products and services. However, there is a substantial body of literature on creating government and nonprofit institutions that facilitate innovation [see Perri (1993), Levin and Sanger (1994), and Light (1998)]. Because the TPI program is envisioned to some extent as a means of encouraging new innovation within the utility-sponsored approach now used in California, we felt it would be useful to explore this area. A major contributor to the interest in government innovation is the "Innovations in American Government Program," sponsored by the Ford Foundation and administered by Harvard University's John F. Kennedy School of Government. Each year since 1986, Innovations awards have been given to programs that "highlight models of innovative government in order to encourage replication, recognize public managers who are the backbone of these exemplary programs, and provide compelling and credible portraits of the many ways in which government contributes to public problem solving and the quality of life" (Ford Foundation, 1998).

The Innovations in American Government Program rewards government innovation. It is not a perfect model for TPI, because it rewards successful programs rather than encouraging their formulation or enhancement, but it is useful for those planning TPI to understand what it takes to make a successful innovation. Atshuler and Parent (1999) provide some of the recurring themes that distinguish the award-winning government programs. "If there is a distinguishing characteristic of an Innovations award winner, it is a determination to complete assigned missions even when it has become clear that that cannot be done according to established ways of doing business." Most efforts have an accountability for outcomes, responsiveness, competition, and problem-solving actions. Levin and Sanger (1994) and Light (1998) note the importance of strong leadership in starting and maintaining innovation in government.

TPI as a Parallel Organization

Gilmore and Krantz (1997) describe the concept of parallel organizations as a means of placing independent organizations separate from, and perhaps in competition with, the existing structure. Examples of parallel process success stories in the private sector are the Saturn division at General Motors or the Macintosh computer at Apple. In the public sector, the concept of "Charter Schools" provides an example of a parallel organization.

Some have conceived of TPI as a test case for an alternative to the utility-based program model. It is worth noting that the creation of a parallel process does not ensure success and, in fact, many parallel process attempts end up doing more harm than good. As Gilmore and Krantz (1997) note, problems can occur if the parallel process is used to bury deadwood rather than really open an alternative, or if resources are insufficient to allow the parallel process to succeed. Many attempts fail to consider and prepare for the inevitable point when the process must be "reclaimed by the formal organization." Regardless of which process is selected, hostility from the losing side can disrupt or destroy any long-term hopes of success.

Another TPI purpose may be to allow for greater diversity and innovation by being outside the existing utility-based system. Greene (1990) advocates setting aside a portion of foundation moneys to try riskier and less programmed purposes. The willingness to tolerate failure of some projects and the less structured nature of these set-aside funds could lead to more innovation. For the California energy efficiency program structure, the TPI could be the mechanism that encourages greater risk taking.

3. Promoting Innovation: Private Foundations

Overview

Foundations are sometimes thought of as society's policy laboratories. At their best, foundations are a place to experiment with ideas that, for many reasons, could not or would not be explored by the private sector or by government. Some foundations are known for cutting-edge work and for taking an active role in shaping a social agenda. Others are more traditional and respond exclusively to unsolicited requests for funding. In truth, most foundations combine elements of both grant-making approaches.

Foundations, like governments, are non-profit entities that are organized to serve or benefit the public. Foundations are, of course, very unlike government in important respects, particularly in the areas of public accountability and contracting practices. This case study does not try to determine which ideas from philanthropy would not be transferable to the government sector. That determination takes place in the report's main recommendations.

This case study is based on interviews of individuals with experience at three U.S. foundations. These interviews were conducted with the promise of confidentiality to the participants to encourage the frankest possible discussion. As written, the case is a synthesis of these interviews and related experiences. The topics covered parallel the interview guide developed for the larger study, but are adapted to the particular circumstances of the philanthropic world.

Initiative Design

Most foundations are established to pursue a general issue or field (*e.g.*, health, environment, education, children's issues). Thus, at the broadest level, identifying fundamental areas of work is governed by an institution's mandate, history, and practice. But within a foundation's (frequently) broad mandate, considerable work is often needed to define a manageable problem around which initiatives can be designed. A foundation's mandate may direct its resources to problems in public education or community development, for example, but the mandate will almost certainly not articulate the specific problems to pursue or the grant-making approaches to bring to bear—these are the first-order issues for program staff to address. Foundations typically tackle these issues through internal studies and by working with the core members of the foundation's existing grantee network and the best available minds in academia and consulting.

At the conclusion of this process, the foundation must be able to clearly articulate the initiative's goals and objectives. There is truth in that old saying "if you don't know where you want to go, then any road will get you here". A clear program goal sends meaningful signals to proposers about what the initiative seeks to achieve. Defining a clear goal is not easy. "Improving educational opportunities" is too vague. What does it mean to improve opportunities? How will we know when these opportunities are improved? Whose opportunities are we seeking to improve? How will we know when the program is making progress? Proposers in turn should be able to articulate clear objectives, defining how their projects will contribute to the program's larger goals.

At a more focused level, however, foundations can take quite different approaches to identifying specific project areas and designing accompanying initiatives. These contrasting approaches can be characterized as internally focused and externally focused. The internally focused approach is more self-directed in its design of initiatives, while the externally focused approach is more

explicitly outward looking. Both can foster innovative work. Interestingly, both approaches can be organized and structured by the use of portfolio management concepts. Projects are viewed as part of a larger portfolio, and it is in the portfolio where the strategic approach to a problem is most readily observed.

While foundations support basic research, many are focused on the development of applied knowledge. A few foundations have program areas (or portions of program areas) that explicitly focus on innovation, though rarely is this term used directly. In describing his foundation's approach to innovation, one official used the phrase "being open to the unexpectedly good idea."

Another foundation's approach to innovation is to focus on problems and projects that will accelerate learning and the application of new ideas. This foundation's staff scout ahead in a chosen field to understand the root causes of problems (and not just their symptoms) and to identify obstacles to progress. Staff then focus on developing projects to remove or reduce these obstacles. This organization imposes a time horizon of 3-5 years; that is, staff attempt to identify ideas that might be ripe to apply in 3-5 years. This approach stems from a belief that even innovative ideas require incubation and testing before they are ready for broader application. In turn, staff are now applying in much broader ways those ideas that looked innovative 3-5 years ago. Importantly, all foundations tackling tough problems recognize that progress is a long-term process, even when working with innovative approaches. Foundations may stay committed to a specific program for ten, fifteen, or even twenty years.

One foundation executive believes that innovation does not need to be promoted. This leader's view is that innovative ideas are already out there in the field. The key is to find these innovative ideas and the people doing the innovative work. The challenge for the foundation is to create an internal structure that is open to these "unexpectedly good ideas". These are not just the good ideas that a seasoned and capable staff can develop—those are the ideas being implemented now. Instead, the search is for the ideas that must be cultivated now to be ready to implement in the foreseeable future.

One foundation official strongly argued that using selection criteria to encourage innovative ideas through a solicitation process is at best extremely difficult and will almost always be counterproductive. He argued that the organization's underlying perspective on a problem will inevitably color its choice of criteria. Proposers will, of course, study these criteria carefully, trying to divine the foundation's underlying take on the issue. The result is a set of proposals that mimic the foundation's underlying perspective on the issue—hardly a recipe for innovative thinking.

Some foundations use a team approach to strategy development, proposal review, and project selection. They avoid staff specialization in a single-issue area, believing that this leaves the entire organization susceptible to that individual's blind spots. In the team approach, each member covers at least two grant-making areas, thus bringing complementary strengths to the development and management of a grant portfolio. Above all, management encourages staff to be open, to not immediately dismiss the project that at first blush looks like an outlier. One foundation assigns unconventional proposals to the staff person that management believes will be most sympathetic to the approach or idea proposed. This helps ensure that unconventional ideas get a fair hearing.

An important aspect of initiative design is the strategic pursuit of objectives using portfolio management. Within a broad program (*e.g.*, education, health, environment), some foundations

will treat an entire subarea (*e.g.*, elementary education, public health, marine protection) as a portfolio. In one foundation, for example, the grant-making in marine protection designs projects in public outreach and in conservation work that are mutually reinforcing.

To be effective, however, the portfolio approach *must* be applied within a sub-area. Take the sub-area of elementary education as an example. This sub-area could be further divided into projects that focus on national standards, curriculum development, and administrative reform. The projects on national standards would all be selected and managed as a portfolio, as would those for curriculum development and administrative reform, respectively.

The grant portfolio is designed to achieve a well-articulated objective and each project makes a contribution. The bulk of the portfolio will be what one foundation executive calls "risk balancers" or projects that could be characterized as low risk and somewhat more traditional. These projects, if successful, will create incremental progress toward the portfolio objective. The portfolio will also include a few higher-risk/higher-reward projects. These projects generally have less than a 50 percent chance of success, but those that are successful will exhibit gains far in excess of the norm.

Under the portfolio approach, the organization's board (or whatever body has final decision-making or oversight authority) must become comfortable with viewing individual projects in the context of the larger portfolio. An innovative idea presented as an independent project may appear high risk, but when the project is viewed as just one part of a larger portfolio the board will probably find the risk more acceptable.

One foundation builds a portfolio using grantees from three different groups. The first consists of a core group of grantees that are applying the best approaches known to the field. The second includes grantees that are making important, but not essential, contributions to the problem (as viewed by the core and by observers of the field). The third group is developing and applying ideas that challenge the approach used by the core and secondary groups. This third group consists of what one foundation official called "the constructive heretics."

One foundation provided the following insight about a typical project portfolio. About 80 percent of a specific portfolio is there by consensus; all program staff agree about the work in this large part of the portfolio. These projects are likely to have most of what another foundation calls its "risk balancers". These are good projects with a high success rate that will result in incremental progress. The rest of the portfolio consists of projects with at least one staff person as its champion. These projects are more likely to be higher risk. A substantial portion of these projects will fail (though the lessons learned from failure can be extremely valuable). The search for innovation requires a willingness to accept higher levels of risk.

Finally, a word on setting budgets and allocating funds. The scale of the problem must be matched with the scale of available resources. This holds true for the portfolio and specific projects within the portfolio. One foundation official stated that they typically do not fund projects for less than $75,000; below that level the grantee cannot devote the services of a full-time staff person to an activity. At the portfolio level, particularly with a set of new programs, foundations may initially set roughly equally budgets for each program. For example, with $15 million to spend on elementary education, the program director will set roughly a $5 million budget for national standards, curriculum development, and administrative reform. These initial (and admittedly arbitrary) allocations are adjusted over time as the performance results emerge; grant funds will flow to the more effective work.

Requests for Grants

Foundations typically issue guidelines that define their program areas, goals and objectives for these areas, and the kinds of projects they do and do not support. The guidelines will also indicate whether the foundation's program solicits proposals or restricts support to foundation-initiated projects.

Foundations with a very directed approach to grant-making will tend to use the latter approach. Foundations with a more open approach will solicit proposals. Proposal solicitation is perhaps most effective for finding innovative ideas when the funding organization is open to the unexpectedly good idea and when knowledge of how to address an issue or problem is not clear. Thus, soliciting proposals is one way to identify and test ideas that will be ripe to apply in the future.

In contrast, the self-directed approach is most effective when the foundation has a clear idea about how to tackle a problem. This suggests that the foundation is applying the best ideas developed in the past few years. The internally focused approach can produce innovative ideas, but it relies on the foundation staff to have at least one proven creator and innovator on board. Yet even with the proven in-house innovator, blind spots in the foundation's approach to problems can emerge. Even creative people can gravitate toward their problem-solving aptitudes. Their tendency may be to search for problems that are amenable to their preferred problem-solving approaches. Judicious use of external and internal peer review of program designs, project selection, and program progress can help mitigate these potential blind spots.

One foundation solicits proposals by stating, in the form of questions, what it wants to know about a problem. These questions must be carefully developed and articulated. The questions are accompanied by a clear statement of the lessons learned from applying past approaches. The key is to get the solicitation to the right people. To do so, the foundation must reach beyond its existing network of grantees.

Whether an organization takes a direct or more open approach to project development requires making strategic judgments. The foundation must candidly assess when it knows the best approaches to a problem and when those approaches are not clear.

Foundations often work with grantees and outside experts to flesh out ideas. This process can be collaborative or more centrally controlled. Refining ideas and planning projects can take place before formal proposals are requested, after the most promising ones are selected, or both.

Grant Selection

Program strategy and the individual projects intended to implement the strategy are either chosen directly by staff (often up to a discretionary size, *e.g.*, $50,000) or through projects that staff submit to the foundation's board for final approval. One foundation breaks the board into smaller groups that have approval authority over a specific grant-making area.

Foundations are not accountable to the public in the same sense as government. A well-managed foundation will use a careful set of checks and balances, however, to foster the appropriate and necessary internal accountability. Junior staff are accountable to senior staff, who in turn must get project approval from senior management. Senior management review can include a review by evaluation or planning staff, or an external peer review. The ultimate internal accountability is

enforced by an engaged board, and of course foundations must operate within the tax laws that charter and govern their existence.

One foundation executive sounded a cautionary note on grant selection: do not cluster innovative proposals together. He viewed this as a high risk approach to encouraging innovation. Instead he favored seeding the higher-risk projects with the risk balancers. Within such a portfolio, seasoned grantees can be mixed with the inexperienced. When funding a group of independent projects, however, the prior track record of the grantee is, in his view, quite important.

Implementation

Good project design, proper staffing, and effective project monitoring are essential to program and project implementation. Several foundations insist that program and project proposals define intermediate and longer-term outcomes. The intermediate outcomes can be the interim benchmarks that will allow foundation and grantee staff to gauge the progress of the program or project. The longer-term outcomes should reflect the program's objectives. Increasingly, foundations look for outcomes that are observable and measurable. The use of outcomes enables project designers to specify what they expect their projects to accomplish and helps inform the foundation about how each project will contribute to its larger goal. Carefully established outcomes re-enforce the focus on program goals and objectives.

One foundation looks for projects that articulate a clear strategy. This foundation pushes designers to expose the logic underlying their projects—by logic, this organization means the rationale that drives the elements of a project and the causal linkages (or assumptions) that lead from project activities to the desired outcomes.

As one evaluation official stated, "Encourage innovation, but always demand performance." As discussed above, set measurable benchmarks. One foundation generally relies on short-term contracts (*e.g.*, generally one year, never more than two years) as an incentive for responsible project management. Contract renewals are tied to achieving the negotiated performance benchmarks.

Evaluation

Most large foundations use evaluation in some form. Those few foundations where evaluation (defined broadly) is well-integrated institutionally use it in many ways—from developing programs and strategies, to project monitoring and strategy assessment. Strategy assessment almost always involves multi-project evaluation, from two or three projects for simple strategies to dozens of projects for more complex or long-running strategies.

Summary

Perhaps the most prominent theme to emerge from this case study is the contrast between internally and externally focused grant-making. Internally focused grant-making is self-directed and pursues ideas that are shaped largely within the organization. Externally focused grant-making actively solicits ideas that are shaped in large measure outside the organization. Both grant-making approaches can result in innovative ideas and projects, but the internally focused approach requires creative leadership from within and should be complemented by external peer review. The externally focused organization must be open to the "unexpectedly good" or innovative idea. Its questions must also reach the proper audience, which might lie beyond the foundation's core grantees. The internally focused organization is perhaps better positioned to more broadly

implement ideas that have been tested elsewhere. The externally focused organization may be better suited to explore those ideas that will become tomorrow's proven approach. Of course, an organization could have elements of both styles; each of the foundations considered for this case study combine, in varying proportions, both grant-making styles.

Regardless of the grant-making approach, good project design and management principles should apply throughout. Program and project objectives and strategies must be clearly articulated. Strategies must be logically linked to the desired outcomes. Program and project designers should be able to identify measurable outcomes. Program and project managers should focus on performance and use principles of portfolio management to manage risk, attack a problem from multiple fronts, and design strategies that combine projects in a logical and, ideally, mutually reinforcing way.

4. Promoting Innovation: Public Sector Initiatives

Overview

To complement our assessment of private foundations, we completed a review of pubic sector initiatives to promote innovation. In doing so, we contacted six energy and non-energy related organizations that are involved with public sector initiatives. These include:

- National Science Foundation (NSF): Small Business Innovation Research Program
- US Department of Energy (DOE): Energy, Inventions, and Innovation Program
- US Department of Transportation (DOT): Mobility Innovation Unit
- New York State Energy Research and Development Authority (NYSERDA)
- Energy Center of Wisconsin
- Rhode Island Renewable Energy Collaborative (RIREC) / New England Electric System (NEES)

Detailed notes from our contacts with these organizations are included in brief case-study format in Appendix C.

Initiative Design

Mission Statements

Importantly, almost all of these organizations have developed an explicit mission statement that guides the design of program initiatives. The single exception to this is the Rhode Island Renewable Energy Collaborative where the "mission" has in some sense already been established through regulatory mandate. Examples of mission statements are provided below.

The mission statement for the NSF SBIR is:

> *"to support high quality projects on scientific, engineering, or science/engineering education problems and opportunities that could lead to significant commercial and public benefit if the research is successful. The SBIR stimulates technological innovation in the private sector, by strengthening the role of small business concerns in meeting Federal research and development needs, increasing the commercial application of federally supported research results, and fostering and encouraging participation by socially and economically disadvantaged persons and women-owned small businesses in technological innovation."*

The mission statement for the US Department of Energy Inventions and Innovation Program is:

> *"provide financial and technical assistance to encourage the innovation and commercialization of energy-related inventions. The mission of the Office of Energy Efficiency and Renewable Energy is to develop and promote the adoption of cost-effective renewable energy and energy efficiency technologies within the building, industrial, transportation, and utility sectors for the benefit of economic competitiveness, energy security and environmental quality of the nation.*

The mission statement for the Energy Center of Wisconsin is:

> *"To sponsor and conduct research in efficient use and management of energy, and to develop, demonstrate, and transfer the results of that research to Wisconsin's energy service consumers and providers."*

The mission statement for NYSERDA is:

> *"The overall focus of NYSERDA's R&D program is on improving New York State's economic competitiveness and energy efficiency in an environmentally sound manner by maximizing the contribution of the State's renewable and indigenous resources and increasing energy related product development. Through its R&D activity, NYSERDA recognizes that energy, the economy, and the environment are linked."*

Importantly, each of the above-quoted mission statements include a description of (1) WHAT – the areas of innovation that are of interest for funding, (2) WHEN – reference both present and future benefits that are sought, (3) WHERE – each contains a geographic target for its programs, and (4) WHO – the constituency that the organization and/or program seeks to benefit. Missing from each is the "WHY" since this is implied by the initial mandate that led to the establishment of the organization.

These mission statements, in turn, provide guidelines for both internal staff and potential grant applicants.

Establishment of Program Areas

As with foundations, each of the organizations that we examined was initially formed to pursue topics within a general field. Most of these organizations, however, have established specific program areas within these general guidelines. While the NSF program remains perhaps the broadest in scope, submittals must nevertheless select from one of 20 categories to classify their projects. ECW also has an established set of program areas that it targets.

In the case of the RIREC, program areas were effectively established after the fact, following the review of proposals received in an initial broad-based solicitation. Recognizing that proposals were not received to address key markets in which demonstration projects were desired, more targeted follow-up RFPs were then issued to address these areas. Although specific program areas may be formally identified in future solicitations, it was felt that the approach used initially was required as part of learning what was "in the market."

Each of the larger energy-related organizations that we reviewed (NYSERDA and ECW) has devoted considerable time and effort to an annual planning process through which specific program areas are reviewed, modified, and chosen. Objectives within these program areas are established. While an externally focused process is used to solicit ideas, the program area definition is often determined internally to balance the mix of market and political pressures, and to align the program agenda with the organization's overall mission.

Requests for Grants

Solicitations are issued to support the mission of the organizations, usually within the pre-determined program areas. Several of the organizations contacted use a two-stage solicitation

process, whereby ideas and / or proposals are first submitted in an abbreviated format (*i.e.*, 1-2-pages). These proposals are then reviewed and either (1) selected to develop an expanded proposal or (2) incorporated into a more focused and widely disseminated RFP. One disadvantage associated with the latter approach is that there is a potential disincentive for proposers to come forth with proprietary ideas that may or may not receive funding. Some government organizations have tried to address this issue by invoking strict confidentiality policies and procedures. We are not sure to what extent these policies have made a difference in easing potential bidders concerns.

Grant Selection

External Review

Nearly all organizations use some type of outside panel to review and inform the project selection process. The ECW, for example, makes use of standing steering committees that guide the entire proposal process within a given program area. These committees are involved with the initial specification of topics that are of interest within a given program area, the review of RFPs developed for these topic areas, and, subsequently, the review and selection of proposals that are received. NYSERDA also involves outside experts in the project selection process. However, since NYSERDA maintains a high level of expertise on its staff, such outside input is generally limited to areas where expertise is lacking. The RIREC did not use outside experts in its review process.

NSF has the most developed and perhaps the most rigorous of the peer review processes. Each proposal is reviewed by three or four outside reviewers made up usually of university professors and highly qualified professional scientists. Each reviewer makes detailed comments about each proposal. These comments are sent to applicants. The DOE Inventions and Innovation Program also uses outside reviewers. USDOT conversely, relies mostly on DOT employees.

Specification of Selection Criteria

The specificity of selection criteria, and the degree to which these criteria are published, varies considerably. The primary advantages of using a very concrete and well-articulated set of criteria is that it ensures a consistent and "fair" selection process (NB: most organizations using a two-stage process have made this a blind review). Importantly, if scoring criteria are well-publicized, then potential proposers may be able to better align their projects and their proposals to suit the needs of the sponsoring organization. Although scoring on any criteria is necessarily subjective in nature, the primary disadvantages of this approach are that it forces an applicant to write for the criteria and it leaves less room for expert judgment in the selection process. Moreover, the inappropriate application of selection criteria can lead to undesirable results.

The NSF has developed what is perhaps the most specific set of criteria for technical screening. At the first stage of review, the proposal must meet the following:

- Does the proposal provide sufficient technical substance to enable review?
- Does the proposal fall within the scope of the topic/subtopic as delineated in the topic/subtopic description?
- Is appropriate research proposed in science, engineering or education?

Next, each panel member reviews the proposal using the following two criteria.

Criterion 1. What is the intellectual merit of the proposed activity? *This criterion addresses the overall quality of the proposed activity to advance science and engineering through research and education.*

- How important is the proposed innovation to advancing scientific and engineering knowledge and understanding?
- Is the proposed plan a sound approach for establishing technical and commercial feasibility?
- To what extent does the proposal suggest and explore unique or ingenious concepts or applications
- What will be the significant contribution of the project to the research and knowledge base of the field?
- Is there sufficient access to resources (equipment, facilities, etc.)?
- How well qualified is the team (the Principal Investigator, other key staff, consultants, and sub-awardees) to conduct the proposed activity?
- For Phase II proposals: As a result of Phase I, did the firm succeed in providing a solid foundation for the proposed Phase II activity?

Criterion 2. What are the broader impacts of the proposed activity? *This criterion addresses the overall impact of the proposed activity.*

- What is the potential use of the product or process developed in the project to advance NSF goals in research and education?
- What may be the commercial and societal benefits of the proposed activity?
- Does the proposal lead to enabling technologies (instrumentation, software, etc.) for further discoveries?
- How well does the proposed activity broaden the participation of underrepresented groups (*e.g.* gender, ethnicity, disability, geography, etc.)?
- Does the outcome of the proposed activity lead to a marketable product or process?
- Evaluate the competitive advantage of this technology vs. alternate technologies that can meet the market needs.
- How well is the proposed activity positioned to attract further funding from non-SBIR sources once the SBIR project ends?

Weighing Technical versus Political Considerations

While technical and political considerations have potential to compete against each other in the grant-making context, most organizations have dealt with this effectively through the design of their organizational processes. The ECW credits heavily its Board membership with balancing these needs. Moreover, since each Board member is able to appoint one representative at each of the program area steering committee levels, this balance effectively flows through the entire organization. Political and technical considerations are weighed at each turn, thereby achieving the necessary balance. NYSERDA credits the history of the institution, as well as relatively stable funding, with providing an environment in which technical and political considerations are balanced effectively. In essence, since program areas (and commensurate funding levels for these areas) have evolved slowly over time, they are quite stable. Their mission is well-articulated, and a track record of success has been established, thereby shielding the organization from buffeting political pressures.

DOE and NSF address these balances in the final selection process after the input of outside reviewers has been received. An internal examination of the portfolio of technically approved projects is undertaken, and the final selections are made through an effort to balance the technical merit with the specified mission policies. For example, the DOE applies program policy factors, such as size of company, relevance to vision/roadmap of Office of Industry Technology, energy relationship and extent of energy impacts on US, geographic distribution, diversity of portfolio, and mix of types of application, to select the actual projects from the technically approved group.

Implementation

Documentation and communication of project outcomes is an imperative step in the implementation of all projects. Beyond this, the level of involvement with a project during implementation typically varies with the project and the sponsoring organization. Each organization is very closely, or actively, involved with the day-to-day operations of at least several of the projects that are funded. The nature of this relationship can vary depending upon the match between grantee and staff technical expertise, geographic proximity, and type of project. The most prevalent trend in this regard appears to be a general readiness on the part of grant-making organizations to be willing to assume whatever role in project implementation that will ensure the ultimate success of the project.

In an effort to promote market development, DOE provides technical assistance and networking support both during and after the funding period.

Evaluation

Within the energy-related programs that were reviewed, there is a strong trend toward program evaluation. ECW conducts formal evaluations of all demonstration and training projects. On-going evaluation is, by definition, built into most R&D projects. Depending upon the scope of the project, evaluations are conducted either internally or using external contractors. NYSERDA requires that each proposal include an evaluation plan. The plan establishes a series of "evaluation metrics" which are tracked throughout the project, and are specific to each project. Grantees are expected to contribute data to the evaluation effort. RIREC does not have any formalized evaluation plans in place. This program has been very focused on simply ensuring that the proposed projects actually come to fruition. There is an expectation that some level of evaluation will be requested by regulatory authorities; however it is also expected that the level of evaluation will be much less focused on estimating energy savings than the evaluation of DSM programs has been. Instead, it is expected that a broader range of "metrics" (to borrow the term from NYSERDA) will be used to characterize program achievements and evaluate success relative to the overall policy objectives.

Up until a few years ago, DOE did an external evaluation of its program. Now, however, an internal evaluation following up on the development progress of the funded projects is performed. NSF SBIR and DOT do not perform a sophisticated evaluation of the program or the projects they fund.

Summary

Mission statements play a crucial role in public-sector initiatives. Many organizations have established program and sub-program areas, the composition of which reflects this mission and external influences. Solicitations frequently employ some variation on a two-stage process – a process that helps organizations focus externally and, in the case of commercialization, understand

the market. The use of selection criteria varies, however, one of the primary advantages of a well-articulated set of criteria is increased potential for alignment of proposers' and sponsors' goals. Organizations are generally capable of tailoring their level of involvement in a project to ensure the ultimate success of the project. In the case of NYSERDA, the organization effectively becomes a business partner with the grant recipient, thereby ensuring a mutually beneficial relationship. Evaluation is being used on many occasions, reflecting a general demand for project performance that was also highlighted within the foundation community.

5. Assessment of Alternative Program Models for TPI

During the course of our review, a variety of the factors were identified as influencing and/or encouraging the level of innovation achieved within private foundations and public sector initiatives. The most prevalent among these include:

- **Define the Organizational Mission** – *having a cogent and meaningful organizational mission serves as a critical rudder through the uncharted seas of innovation*;

- **Identify and Define Program Areas** – *program areas, and program sub-areas provide a structure within which the organizational mission can be implemented;*

- **Implement a Strategic Solicitation Processes** – *the solicitation process should reflect both the organizational mission, and the nature of the program areas for which solicitations are desired;*

- **Require that Proposals Articulate Strategy for Achieving Program-level Objectives** – *the RFPs should require proposals to state their strategy and the expected measurable milestones for achieving program-level objectives.*

- **Use a Broad-based Selection Process** – *selection processes are often used that have explicit criteria, but also establish a process whereby external input is obtained.*

We present in this section a detailed discussion of these factors as they relate to the TPI program. Where appropriate, we have highlighted potential choices that CPUC must make regarding the role that TPI will assume in shaping California's energy efficiency future.

Defining the Organizational Mission for TPI

Most of the organizations reviewed have mission statements that are readily available and that were referenced during discussions of organizational objectives. Although this may seem, in some sense, to be a formality, the exercise of defining an organization's mission is critically important – especially when dealing with something as intangible as the concept of innovation. In short, a mission statement provides a degree of context within which various definitions of innovation may be interpreted and constrained. Moreover, the very act of developing a mission statement can serve as a process-tool that helps to better define the overall purpose (raison d'être) of an organization. In the case of NYSERDA and the ECW, each mission statement emphasizes that the benefits of their initiatives should accrue, first and foremost, to the citizens of New York and Wisconsin, respectively.

Based upon our review of alternative program models, three fundamental issues that should be considered in developing a mission statement for TPI include:

- Is TPI intended to be a "Parallel Replacement Organization" or an "Innovation Incubator"?
- Should TPI be externally or internally focused in project development?
- What is the appropriate portfolio from a time and risk perspective?

"Parallel Replacement Organization" or "Innovation Incubator"?

The most essential point that must be clarified in establishing the mission for TPI and ensuring innovation is whether the program is intended to (1) serve as an incubator for new ideas, (2) serve as an alternative model to utility-based energy efficiency, or (3) both. Although these paths are not mutually exclusive, they each require different organizational structures. Parallel organizations require a greater commitment of time and resources, while the tenure of an incubator organization could be shorter in duration. Therefore, while it is entirely possible that TPI could be positioned as an incubator in the near term, and begin to transform itself over time into a replacement for utilities, this would greatly complicate program administration. Ultimately, it may not be possible for a single organization to be charged with achieving both missions and complete each mission well.

If the CBEE decides that an organization needs to be set up to serve as a true parallel to utility-based efforts, then additional study is needed. We have not devoted our attention to that research question. This report focuses almost exclusively on the ideas-incubation path. Regardless of what else was intended for TPI, the CBEE clearly has intended that the TPI program to be a source, or generator, of new ideas for delivering energy efficiency services. We have therefore conducted our interviews with a focus on determining how other organizations accomplish the mission of "generating ideas."

External vs. Internal Focus

The review of private foundation organizations highlighted that foundations can take an approach to their grant-making that is either externally or internally focused. Internally focused grant-making is self-directed and pursues ideas that are shaped largely within the organization. Externally focused grant-making actively solicits ideas that are shaped in large measure outside the organization.

Some of the programs we examined were very internally focused. The DOT programs, for example, are quite internally focused. Two of the energy-related programs represent a sort of hybrid approach, being internally focused in the development of program areas and more externally focused in the solicitation of proposals and ideas. NSF is perhaps the most externally focused of the organizations reviewed, where the types of projects sent in determine the direction for the SBIR's.

From our perspective, if TPI is to be an ideas-generator, TPI should operate as an externally focused model. TPI does not, at this point, have its own creative leadership that can define research directions. To pursue an internally focused approach would necessarily rely upon utility staff for direction, which may not ultimately produce the level of innovation desired. Establishing an organizational structure for TPI that is more externally focused may provide a positive contrast to the internally focused utility model.

In implementing an externally focused model, TPI should keep the solicitation process open to encourage the "unexpectedly good" ideas. This generally means using broadly-defined solicitation criteria, widely disseminating RFPs, (importantly) utilizing outside expertise, embracing a longer-term perspective on program development, and developing a culture that is willing to take risks.

What is the Appropriate Portfolio from a Time and Risk Perspective?

Administrators for the TPI program should consider selecting and managing projects as part of a portfolio. The portfolio is designed to achieve an overall objective and each project makes a contribution to achieving that objective. Such a portfolio would include "risk balancers" or projects that could be characterized as low risk and somewhat more traditional. These projects, if successful, will create incremental progress toward the portfolio objective. The portfolio should also include a few high-risk/high-reward projects. These projects may have less than a 50 percent chance of success, but those that are successful will exhibit gains far in excess of the norm.

Importantly, the portfolio should be shaped by a clear sense of strategy. The chosen strategy should clearly support TPI's larger mission and should have a clear development process. As with many endeavors, too much breadth is a recipe for ineffectiveness (*e.g.*, is it necessary that every administrator develop residential, commercial, and industrial programs, each of which includes a range of end-use targets? This degree of diversity may not be strategic.). Consideration needs to be given to which markets hold the most promise for transformation. A portfolio could then be developed to pursue these markets on multiple fronts by concentrating on projects that address the root causes of market "barriers."

Some consideration also needs to be given to the time frame under which TPI develops projects. As noted in our review of foundation approaches, some foundations look ahead to generate new ideas, while others try to encourage solutions to existing problems. Several of the larger government organizations we examined have defined stages for the development of projects, and some of those restrict funding to specific stages of development.

Additional issues related to the time horizon are budgets, fiscal stability, and continuity across program agendas. Organizations that appear to have successfully promoted innovation tend to have relatively stable funding levels. This becomes even more important in the context of TPI, especially when one takes into consideration that TPI's purview also encompasses services, educational outreach, and market development. Such market transformation implies a longer-term perspective, and therefore it would be appropriate for TPI to include some longer-term projects, and idea-generation funding into its overall portfolio. In a sense, the TPI program is different from DOE's Invention and Innovation Program, or NSF's Small Business Innovation Research, in that those programs focus on products.

Identifying and Defining Program Areas

Annual Planning Process

An annual planning process facilitates the evolution of an organization's long-term mission and structure while, at the same time, providing a forum through which near-term goals and objectives can be debated and set. Such a process also provides continuity from year-to-year, a requirement for successful program development. Within the planning process used to establish program areas, a critical topic for discussion is the degree to which program areas should be defined (or left open), and the perspective that will be employed in establishing such program areas.

How Much Specific Program-Area Identification Is the Right Amount

Most of the programs reviewed have established specific program areas and, beyond that, many employ various sub-program areas. Program-level objectives are established and guide the solicitations in a given year. This is, in many ways, the first step toward implementing an

organization's mission statement through a tangible and workable organizational structure. Once established, program areas then serve as a structure within which budgets are allocated, and various experts are assembled (see "program-level steering committees," below). Even programs that address energy efficiency have established program areas within what might otherwise appear to be a relatively narrow field.

The NSF SBIR model is a notable exception, providing a model that is completely opposite to that described above. NSF SBIR does not set up predetermined budget allocations, but rather determines the allocation based on the interests shown via the proposals submitted. NSF's philosophy is that the government should chose the best projects regardless of the research area. They do not presuppose that research in one area of science will be more important than in another. NSF is able to accomplish this because its program managers are considered generalists rather than experts in their fields. NSF assembles experts from outside to review the technical competence.

Within the context of TPI, more structure in the form of traditional market-segment program areas may not encourage a high level of innovation. However, if program areas are defined through an examination of the root causes of market transformation barriers, useful program areas may be defined. Examples may include addressing particular problems such as developing innovative marketing approaches, or testing new ways to overcome landlord/tenant problems. The use of such program areas may be more fruitful in stimulating breakthrough innovations than would be achieved by structuring program area around segments (residential, commercial, industrial) or technologies (HVAC, lighting, motors).

Program-level Steering Committees

Building upon the concept of defining specific program areas in which an organization intends to focus its resources, each of the organizations reviewed typically uses some variant of a panel of experts to guide these program and sub-program areas. Such panels typically draw upon a diverse mix of individuals (experts and stakeholders) from "members" (large donors or funding sources), university professors, and other acknowledged experts in a given field. In many respects, this process is similar the concept of peer review that is used extensively within the academic community. These panels of experts will work with organizational staff to refine program focus, develop solicitations, review proposals, and recommend funding.

TPI should consider developing an ideas-generation group. This could be a broad network of bright people from academia, research, and the energy marketplace, who would regularly (*e.g.*, annually) nominate ideas, strategies, or products for review. These ideas could then become the basis for specific RFPs (either research or implementation).

The Solicitation Process

Solicitation Promotion

In order to have a successful solicitation process that implements the critical success factors noted below, it is important that enough potential participants step forward with proposals. For this reason, many organizations devote substantial efforts toward promoting their programs and seeking out those individuals and/or organizations that may not be within their traditional circle of contact. The promotion of well-established organizations and programs is less critical, as such organizations are more likely to be sought out actively. Newer and less well-known organizations, however, have a greater need to reach out to their target audience and build a network.

Establishing linkages to universities, state agencies, professional organizations, and business development agencies can be vital to the success of a program such as TPI.

Two-Stage Solicitation Process

In order to stay close to the "market," and encourage innovation, many of the organizations reviewed use a two-stage solicitation process whereby "ideas" are first solicited and reviewed using a consistent scoring process. Concepts deemed competitive or otherwise worthy of further consideration are then advanced to the next level. At the next level, depending upon the organization, a variety of steps may occur. In some organizations, the selected proposers are then requested to develop a full-fledged proposal for consideration. In other cases, the selected proposal concepts are then developed into targeted RFPs which are then opened up again to a general (but more focused) solicitation process. In either event, the objective is to identify promising ideas and to then focus specifically on those ideas that show the greatest promise and are aligned with an organization's mission statement.

In the DOE case, applicants are encouraged to submit a pre-bid concept paper. This paper is reviewed by DOE staff who either encourage the applicant to complete a full proposal, or provide technical assistance to the applicant on how to refocus the proposal to meet DOE's expectations.

Targeted and Broad Solicitations

Many organizations that appear to be successful at encouraging innovation generally issue both broad and targeted solicitations. Targeted solicitations are used to address programmatic objectives that are well defined and relatively well understood. Room is also made, within the portfolio, for a set of broader solicitations that are less specific in their requirements.

Multi-staged Projects

Since many of these projects are initiated in the incubation stage, a lot of positive progress or development is needed to bring the product or service to its final position. Both NSF and DOE recognize this by specifying program stages, and providing funding for only one stage at a time. Those projects successfully completing the awarded stage are encouraged then to submit a subsequent proposal for the next stage. Such an approach may be used in conjunction with program-area definitions as a means of developing a longer-term portfolio.

Guarantee of Confidentiality

Because TPI will be dealing with, and encouraging, the submission of new ideas, a process needs to be set up to ensure the confidentiality of applicants' proprietary ideas. Absent such procedures, innovators may be reluctant to step forward with their best new ideas. Establishing a process involves the formal designation of the confidential areas in the proposal by the applicant, and a signed, legal guarantee of protection of confidentiality by reviewers. The DOE program has a good format for accomplishing this requirement.

Require Proposals to Better Articulate Strategy for Market Transformation and Project Outcomes

Insist on Measurable Outcomes

Foundations and public sector initiatives alike have both placed a substantial degree of importance on outcomes – both measurable and those that are less tangible. Program and project proposals

should define intermediate and longer-term outcomes. The intermediate outcomes can be the interim benchmarks that will allow TPI administrators to gauge the progress of the program or project. The longer-term outcomes will reflect the project's goals and the compatibility of these goals with long-term objectives of the TPI program. These outcomes should be observable and measurable. The use of outcomes enables project designers to specify what they expect their projects to accomplish and help inform TPI administrator about how each project will contribute to TPI's larger goal. Carefully established outcomes re-enforce the focus on program goals and objectives.

RFPs Should Ask for Details on the Project's Strategy

Each project should be able to clearly articulate a strategy that will lead to the desired change in the marketplace. The project should lay bear its logic--by logic we mean an articulation of the rationale that drives the elements of a project and of the causal linkages (or assumptions) that lead from project activities to the desired outcomes.

RFPs Should Focus on Performance

As one foundation head put it, "Encourage innovation, but always demand performance." As discussed above, this means that each proposal should set measurable benchmarks. For most projects, TPI should consider using short-term contracts that focus on achieving one-stage of the effort. Contract renewals should be tied to achieving performance benchmarks. To do this effectively, TPI and the projects themselves will need to establish effective monitoring plans to gauge project performance.

The Selection Process

Expert Review Panel

To score and recommend proposals to be selected, most organizations use expert review panels, comprised of both internal staff and persons ("experts") drawn from the outside. The formulation of committees with a wide range of expertise helps foster innovation and increases the chances that the merit of a new idea is recognized appropriately.

Of course, the TPI administrator already uses review committees. As a step toward ensuring innovation, the committees should reach beyond utility staff and its technical advisors. The review committees should include the private sector, and individuals who have actually run programs. TPI should invite a heretic or skeptic to review proposals. Committees dominated by like-minded individuals will tend to favor more traditional approaches.

Specifying the Criteria

Asking reviewers to pick the best proposals first requires that everyone understands what "the best" means. Setting up selection criteria is a way for both applicants and reviewers to understand what is being sought in the RFP. The trick is being specific about what is desired without limiting the approaches used to get there. One foundation interviewee cautioned against using specific criteria, but that advice may not be applicable to government institutions. Good models of selection criteria are the DOE and NSF case studies. Each of these organizations poses a series of questions on the technical quality of the proposal and examine the proposed project's contribution to achieving the program objectives. Ultimately, the TPI program will need to develop its own set

of criteria that reflect its ultimate mission of market transformation. While this will not be an easy task, it will be a critical step in establishing the TPI program as a vehicle for innovation.

Balancing Technical and Political Needs

Government agencies and non-profit programs funded via the government face different restrictions regarding the disbursement of funds than foundations. Government institutions must consider policy issues, such as geographic diversity, gender, variety of program type, conformity to broader policy issues, etc., in the awarding of grants and contracts. The concern is how to balance these policy considerations with the technical content of the proposal. Most of the case studies use a two-stage or even three-stage selection process to accomplish this. The first stage of the process, or the first two stages in a three-stage process, select and rank projects on their technical competence. The peer review experts (or review experts followed by review panels in the case of a three-stage process) do these reviews. After these technical reviews, a program officer, who is normally an employee of the granting agency provides a third-stage review. He or she adjusts the technical selection to reflect any policy criteria that the agency wishes to consider.

TPI will need to specify explicitly what policy criteria, in addition to the technical criteria, it wishes to consider in making awards. Importantly, as a means of maximizing the chances of innovation, such policy considerations should be invoked only after proposals have been competitively screened for their technical content.

Matching Fund Requirements

In all types of organizations, the availability of matching funds are either required or factor very heavily into the proposal selection process. NYSERDA, for example, expects to see matching contributions equal to at least the amount committed by NYSERDA. The rationale behind this is that they are willing to share the risk with a company or entrepreneur in developing an innovation, but the proposal has a much greater chance of long-term success if another party is also financially liable for that success. Similarly, within the foundation community, proposals that are accompanied with commitments for either internal funding or outside funding from another organization are often viewed favorably.

Summary and Recommendations for Encouraging Innovation

These are attributes that successful organizations have adopted, and that should be considered by the administrators of the TPI program as a means of ensuring innovation in project proposals.

- Establish a strategic mission for the TPI program.
- Establish whether TPI is to be a “replacement organization” or an “innovation incubator.”
- Clarify whether the intent is to be internally or externally focused, or both.
- Establish a consistent time horizon for the organization and projects that are funded.
- Implement an annual planning process to establish program areas.
- Consider utilizing non-traditional program area definitions.
- Establish a panel of experts to comprise program-level steering committees.
- Develop a communications and out-reach plan that will maximize the exposure of all solicitations.
- Implement a two-stage solicitation process.
- Insist on measurable outcomes and a clear articulation of strategy.
- Use expert panels in the technical review of proposals.

- Publish technical criteria upon which proposals will be evaluated.
- Encourage the requirement of significant matching funds in some projects.

Appendix A - Interview Questions
TPI Interview Questions

A. Initiative Design and Budget Allocation

- Does the mission for your organization explicitly include the promotion of innovation? If so, how does your organization define innovation? (Perhaps defined by what it is not?)
- How would you characterize your organization's approach, in the broadest sense, to encouraging innovation?
- If your organization identifies specific "program areas" that it wishes to promote with individual projects, how are these program areas selected, and who is involved in this process? (Probe: insiders, outsiders, technical experts?)
- Within your organization, who is involved in the actual program design process? How are these persons selected?
- Do you develop specific goals for each program area? (examples?)
- Is there a body of past organizational experience in this area that is drawn upon?
- How do you decide where to place limits on the types of projects that are acceptable?
- Within a program area, do you set aside a portion of your budget for specific topics?
- Do you leave a portion of your budget for unspecified topics? How do you decide this allocation?

B. Pre-RFP

- What kind of relevant information is made available to potential bidders before the RFP is issued? (*e.g.*, organizational objectives, proposal criteria, selection criteria…)
- What kind of notices or announcements do you provide in advance of an RFP being sent out? How much detail do these notices provide, and how far in advance of a solicitation are they sent?
- How do you identify the targets to whom you will distribute an RFP?
- Do you have specific target audiences that you reach out to?
  (*e.g.*, do you have a standard list to which you typically distribute?)
- Do you allow pre-RFP contact between your organization and potential bidders?
- Is pre-RFP contact encouraged?

C. RFP

- How do you describe your request? Are these requests generally *spelled out in detail or left fairly* broad? Do you have standard / boilerplate language or definitions about innovative ideas? A glossary?

- Are requirements for innovation stated (explicitly or implicitly) and, if so, how are these described?

- Are selection criteria specifically stated? If so, how are selection criteria for innovation defined?

- Do you provide any sort of assistance to applicants in preparing their proposals? If so, please describe.

D. Selection

- Who is on the selection committee, and how are these people chosen?

- Are people from outside your organization included on selection committees?

- What criteria are used to select proposals? Is a scoring system used and, if so, how was it developed?

- How important is likelihood of project success in the selection criteria

- How important is prior experience vs. creativity and innovation? How are those dimensions defined and assessed in the selection process?

E. Implementation

- What sort of project management or involvement does your organization have during the implementation of a project?

- What types of reporting are required of grant recipients?

- What is the typical time duration of selected projects?

F. Evaluation

- How do you evaluate the success of the projects that are funded?

- What level of resources do you devote to formal evaluation?

G. Other Questions

- Do you have any other suggestions for improving the ability to obtain innovative proposals?

- Do you know of other organizations that we should be contacting that focus specifically on innovation?

- Do you have any suggestions on how we might ask others (or you) about the solicitation of innovative ideas?

Appendix B - Public Sector Initiative Case Study Summaries

National Science Foundation Small Business Innovation Research Program (NSF SBIR)

Dr. Kesh Narayanan, Program Director
703-306-1390
http://www.eng.nsf.gov/sbir

Mission Statement

The mission statement for NSF SBIR is to

> "support high quality projects on scientific, engineering, or science/engineering education problems and opportunities that could lead to significant commercial and public benefit if the research is successful. The SBIR stimulates technological innovation in the private sector, by strengthening the role of small business concerns in meeting Federal research and development needs, increasing the commercial application of federally supported research results, and fostering and encouraging participation by socially and economically disadvantaged persons and women-owned small businesses in technological innovation."

Overview of Approach

NSF SBIR sets aside a small portion of NSF's funding (approximately 2.5 percent) to encourage small business participation. The success of NSF's program has led to similar SBIR programs in many other government agencies. There are three funding stages to NSF SBIR.

Phase I is a six-month experimental or theoretical investigation on the proposed innovative research or activity. This phase is to determine the merit and feasibility of the concept. SBIR's aim is to fund those project that having proven feasibility will be developed into commercial products, processes, devices, or techniques. Phase I awards are up to $100,000.

Phase II further develops the proposed concept from Phase I. Only completed Phase I projects, with acceptable Phase I Final Reports, are eligible for Phase II. Phase II awards are up to $400,000.

Phase III's objective is to pursue commercial applications of government funded research, though Phase III are not normally funded by NSF.

Organizational Structure

The key to all of NSF's solicitations is the peer review concept. All proposals are reviewed by an outside group of expert reviewers and then a program manager who is responsible for ensuring that non-technical issues such as diversity are included in the decision process.

The NSF SBIR does not pre-specify how much money is allocated to particular topics. This is because they do not to make preconceived judgments of the relative value of research in one field compared to another. NSF SBIR has developed a unique approach for allowing this budget flexibility.

Applicants must select a single subject category under which they classify their project. SBIR groups 20 proposals on similar topics into a panel, and assigns a program manager. If more proposals are received for one topic such as astrophysics, then more panels will be assembled in that area. The SBIR program manager relies on the NSF topic-related program officer for selecting panel members. Program managers for SBIR do not need to have technical expertise in the applicant's area, because that expertise is available in the larger organization. (Because TPI does not have the built-in expert pool of the NSF work force, they would be dependent on experts from outside to replicate the flexible model used by NSF.)

Each program manager handles 10 panels or 200 total proposals.

Program Development and Budgeting

The program has existed from 1991 onward. In 1998, $54 million, or 2.5 percent of NSF's total budget was devoted to the SBIR program. In 1998, NSF received 1,635 applications and funded 211, an acceptance rate of 12 percent. Of the 1,635 applicants, over 400 were first time applicants to NSF. Many of the others were proposals resubmitted from earlier years.

Promotion and Outreach for Solicitations

NSF promotes the program via publication of a program announcement on the web page, the *Federal Register*, and through presentations at various trade meetings.

The solicitation itself is only accessible via the NSF home page. Hard copies are no longer sent via mail.

Selection Process

As noted, panels are formed with 20 proposals on similar topics. Each panel has six to eight reviewers who each review 10 proposals. Each panel member reviews the technical merits of the project dividing the proposals into one of three categories: highly recommended (normally about 25 percent receive this ranking), recommended if funds are available (37.5 percent), and do not consider (37.5 percent). Detailed notes are kept by each reviewer, and these are given verbatim to each applicant.

The panel then meets as a group and discusses all 20 projects. Each panel member ranks the 20 projects, and the average of the 20 becomes the panels ranking.

The program manager then must review all 20 proposals. He or she may determine that a particular proposal, regardless of its ranking, requires an additional review. The reason given in the interview is that the project is of such a specialized nature that panel members did not have enough expertise to evaluate the merits of the particular proposal.

The program officer then must decide on which of the projects are most worthy of funding. Each program manager can choose only around 20 to 25 projects.

Selection Criteria

The proposal are screen for administrative compliance, and then for technical screening using the following criteria.

- Does the proposal provide sufficient technical substance to enable review?
- Does the proposal fall within the scope of the topic/subtopic as delineated in the topic/subtopic description?
- Is appropriate research proposed in science, engineering or education?

Next, each panel member reviews the proposal using the following two criteria.

Criterion 1. What is the intellectual merit of the proposed activity? *This criterion addresses the overall quality of the proposed activity to advance science and engineering through research and education.*

- How important is the proposed innovation to advancing scientific and engineering knowledge and understanding?
- Is the proposed plan a sound approach for establishing technical and commercial feasibility?
- To what extent does the proposal suggest and explore unique or ingenious concepts or applications?
- What will be the significant contribution of the project to the research and knowledge base of the field?
- Is there sufficient access to resources (equipment, facilities, etc.)?
- How well-qualified is the team (the Principal Investigator, other key staff, consultants, and sub-awardees) to conduct the proposed activity?
- For Phase II proposals: As a result of Phase I, did the firm succeed in providing a solid foundation for the proposed Phase II activity?

Criterion 2. What are the broader impacts of the proposed activity? *This criterion addresses the overall impact of the proposed activity.*

- What is the potential use of the product or process developed in the project to advance NSF goals in research and education?
- What may be the commercial and societal benefits of the proposed activity?
- Does the proposal lead to enabling technologies (instrumentation, software, etc.) for further discoveries?
- How well does the proposed activity broaden the participation of underrepresented groups (*e.g.* gender, ethnicity, disability, geography, etc.)?
- Does the outcome of the proposed activity lead to a marketable product or process?
- Evaluate the competitive advantage of this technology vs. alternate technologies that can meet the market needs.
- How well is the proposed activity positioned to attract further funding from non-SBIR sources once the SBIR project ends?

Additionally, the following factors are also considered in making an award, though the program managers may play a larger role in considering these factors.

- One of the principal strategies in support of NSF's goals is to foster integration of research and education through the programs, projects, and activities it supports at academic and research institutions. These institutions provide abundant opportunities where individuals may concurrently assume responsibilities as researchers, educators, and students, and where all can engage in joint efforts that infuse education with the excitement of discovery and enrich research through the diversity of learner perspectives.

- Broadening opportunities and enabling the participation of all citizens – women and men, underrepresented minorities, and persons with disabilities – is essential to the health and vitality of science and engineering. NSF is committed to this principle of diversity and deems it central to the programs, projects, and activities it considers and supports.

Lessons Learned

The collective judgment of a well-qualified, independent panel is the best way to select projects.

University faculties have been the best source of reviewers. They are generally better aware of what is truly new and innovative. Although they may not be good business persons, they do have a good sense of markets.

Sending detailed comments to the non-accepted applicants is a good way to improve the quality of next years' applications.

Other Contacts Suggested:

The US Department of Commerce, National Institute for Standards and Technology (NIST) Advanced Technology Program.

"Not yet" technologies are the domain of the NIST Advanced Technology Program. The ATP works by encouraging a change in how industry approaches R&D, by providing a mechanism for industry to extend its technological reach. Focused programs already exist in two areas relevant to California utilities: Premium Power—development of advanced electric power technologies, and Vapor Compression Refrigeration Technologies. The program also has a mechanism for proposing a focused program.

http://www.nist.gov/atp

The US Department of Energy, Inventions and Innovation Program

David Crouch, Program Director
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http://www.oit.doe.gov/inventions/

Mission Statement

The program is conducted at the US DOE, Office of Energy Efficiency and Renewable Energy (EE) and "provides financial and technical assistance to encourage the innovation and commercialization of energy-related inventions. " The program focuses on the dominant energy-consuming industries in the US: Aluminum, Chemicals, Forest Products, Glass, Metal-Casting, and Steel.

Overview of Approach

The Inventions and Innovation Program provides financial assistance at two levels: up to $40,000 or up to $100,000—depending on development stage—for establishing technical performance and conducting early development of innovative ideas and inventions. Ideas that have a significant energy savings impact and future commercial market potential are chosen for financial support through a competitive solicitation process. In addition to financial assistance, the program offers technical guidance and commercialization support to successful applicants.

Organizational Structure

The Inventions and Innovation Program encourages potential applicants to submit a two-page pre-bid. DOE will quickly inform the applicants of the program relevance of their idea.

The applicant then submits a proposal by one of two annual submission deadlines.

The grant award is made based on two-stage review process.

Mentoring and networking support is provided during and after the project period.

Projects are classified into five development stages:

- Stage 1: Conceptual – The period when the concept is proven. The objective of this stage is to demonstrate through tests or analyses the performance or implementation potential of a concept. Eligible up to $40,000.
- Stage 2: Technical Feasibility – The period when it is proven that it is possible to produce the product. The objective here is to confirm the target performance. Eligible up to $40,000.
- Stage 3: Development – The period when any needed improvements in materials, processes, and design are made. The objective is to make the needed improvements and to confirm that the product will perform as specified by constructing prototypes or pilots. Eligible up to $100,000.
- Stage 4: Commercial Validation or Demonstration – The period when the product is prepared for the marketplace. The objective is to develop the manufacturing techniques and establish test market validity. Eligible up to $100,000.

- Stage 5: Full Scale Production or Deployment – The period during which the manufacturing or process facility is built and full-scale production begins. The objective is to put the product into commercial production. Eligible up to $100,000.

Program Development and Budgeting

Each of the six dominant energy-intensive industry research sections in the Office of Industrial Technology defines which research areas they believe are important. Companies submitting projects in these key areas are given more consideration. This does not preclude the funding of worthy projects in other areas. For example, a project on increasing yields in oil fields was recently funded, even though it did not fit into a research area defined that year.

Promotion and Outreach for Solicitations

DOE promotes the program via publication of a program announcement on the web page, the *Federal Register*, and through presentations at various trade meetings and advertisement in trade journals.

Selection Process

There are essentially five steps in the selection process.

- Responsiveness Review: A check is made to make sure critical items are present in proposal.
- Eligibility Review: A review is made to determine if the project is relevant to the Office of Energy Efficiency, and that responses are detailed enough to make a recommendation.
- Technical Reviews: Two reviewers outside of the Inventions and Innovations Program will review each proposal. A big issue is the need to ensure confidentiality. All reviewers are required to protect the confidentiality of any materials. A specific procedure is in place to designate areas of the proposal which are confidential.
- National Panel Selection. A panel comprised of DOE and Laboratory personnel will evaluate the information provided in the application and reviews. The panel ranks the projects on technical competitiveness.
- Selection, Negotiation, and Award. The program manager applies program policy factors, such as size of company, relevance to the vision of OIT, relationship to energy and extent of energy impacts on US, geographic distribution, diversity of portfolio, and mix of Category 1 (Development Stages 1 to 3) and Category 2 (Development Stages 4 and 5) applications.

Selection Criteria

There are four technical criteria similar in nature to the NSF SBIR program. They are presented here in abridged form.

Criterion 1: Technical Feasibility and Energy Impact (50 points): The technology must be demonstrated to work or clearly be capable of working as claimed, and it must be innovative and offer a clear technical or other competitive advantage over current technology. The technology must also show the potential for a significant impact on the U.S. energy sector by either offering opportunity for energy savings or by adding to the nation's energy supply.

Criterion 2. Commercial/Economic Potential (20 points). The technology must be shown to have a competitive advantage, such as functional superiority or a lower selling price.

Criterion 3. Applicant Capabilities (10 Points). The applicant must have, or have access to, the required capability, staff, equipment, and facilities to carry out the proposed work.

Criterion 4. Statement of Work (20 Points). The applicant must identify and describe the principal tasks and technical milestones included in the project.

Evaluation

One evaluation of the program was performed several years ago. Now the program does an internal informal evaluation, mostly consisting of follow-up calls.

Lessons Learned

The key to the success of a program of this type is the selection of well-qualified reviewers.

Providing technical assistance and mentoring during and after the award period is a critical component. The program includes Commercialization Strategy Workshops for proposal winners. In addition, regional contacts at one of five laboratories provide a means of local networking and problem solving. The support includes: "regional training and learning centers for business planning, regional, state, and local level support for economic development, incubation centers specializing in small energy-related technology businesses, internet sites and information relevant to energy-related innovations, technology conferences and trade shows, and forums for financial investors with particular interest in energy-related businesses".

US Department of Transportation Federal Transit Administration Transit Service and Management Innovation Program

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http://www.fta.dot.gov/library/technology/tsamp.htm

According to their web page, "The Transit Service and Management Innovation Program (TSAM) of the Federal Transit Administration (FTA) responds to key vision strategies in the FTA Strategic Plan. TSAM is oriented towards resolving day-to-day concerns of transit managers by developing and promoting improved practices. The TSAM links technological developments, sponsored by FTA, with practical applications, to help foster their adoption."

TSAM focuses on riskier projects with potential higher benefits than other parts of FTA's transit programs. They accomplish this through several approaches: the use of case studies of local non-federally funded projects; empirical demonstrations of new ideas using strong data collection and evaluation efforts; technical evaluations of FTA programs; research studies fostering new ideas, practices, and techniques; and technical assistance, outreach, and information sharing.

Examples of innovative projects include new farecard approaches and pricing schemes, support of independent transit initiatives, rail and bus linkaging efforts, inter-city to suburban work opportunity bridging efforts, and congestion management initiatives.

TSAM generally uses an internally focused approach for designing programs and issuing RFPs. Reviewers are normally internal employees or employees of DOT in other offices. RFPs are written to focus on a particular research or implementation issue.

RFPs are graded on a program-specific ranking scale. The latest RFPs have included the possibility of adding up to an additional 10 points to an application's score for any project that is deemed to be innovative. Innovation is but one of the criteria that can earn up to the maximum of 10 extra points. For example, points can be awarded for projects that employ an employer transportation strategy or offer linkages to other government services. The criteria for what constitutes innovative were defined explicitly in two RFPs, and were left to the judgment of the reviewers elsewhere. The program manager noted that so far the availability of extra points for innovation has not really affected the outcome of any selection.

US Department of Transportation Federal Transit Administration Bus Rapid Transit Demonstration Program

Stuart Mckeown
202-366-0244

The Federal Transit Authority's Bus Rapid Transit Demonstration Program (BRT) was cited as an example of a program designed to encourage innovation within the DOT. The BRT solicits public transportation agencies attempting to introduce innovative bus service as an alternative to rail-based rapid transit. The program is designed to get transit and government agencies interest in "low-cost investments in infrastructure, equipment, operational improvements, advanced bus technologies, and Intelligent Transportation System technologies can provide the foundation for BRT systems that substantially upgrade bus system performance." The project seeks to replicate the success of bus transit as it is used in Brazil, by encouraging experiments using pre-board paying options, advanced bus technologies, ITS, road or access redesign, and fleet management improvements.

This is another example of internally focused grant-making. All of the design of the program, specification of the criteria, and selection of the proposals is done in-house. The criteria for selecting the projects are very structured, though those criteria are not included in the RFP.

Actual improvements suggested by these types of projects are very costly, generally in the billion dollars or more range. The actual funding will require large government funding from other sources. The BRT Demonstration is a way to test out some of these ideas.

US Department of Transportation Federal Transit Administration DOT Small Business Innovation Research

DOT also has a SBIR program modeled after NSF's. The total budget is $8,000,000. Within FTA, there are two initiatives: Transit Applications of Virtual Reality and Simulation Modeling, and Head-Up Displays for Transit Bus Collision Avoidance Systems. The RFP uses much of the same wording as in NSF.

Energy Center of Wisconsin

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Mission Statement

The ECW does not use the term "innovation" explicitly. However, it is embedded within the organization's overall mission statement:

> *"To sponsor and conduct research in efficient use and management of energy, and to develop, demonstrate, and transfer the results of that research to Wisconsin's energy service consumers and providers." (from ECW web site)*

Within this context, they define innovation to encompass, most broadly, "new knowledge – physical, management approaches, software."

Overview of Approach

The approach used by ECW is to look for new knowledge, within the areas they are working, that consumers and service-providers should have. To do so, they typically draw upon a wide range of scientific literature, trade journals, other organizations, outside experts, and in-house expertise. When gaps in knowledge or applications are identified, then ECW will undertake their own original research. Take and create knowledge…then transfer the technology.

Organizational Structure

The ECW Board of Directors consists of 12 members, including representatives from:

- Investor Owned Utilities (5),
- Municipal Utility (1)
- University of Wisconsin (2)
- Public Interest Groups (2)
- Public Utility Commission (1)
- Wisconsin State Energy Office (1)

Under this Board is a Central advisory committee, which includes a representative appointed by each Board member. The approach whereby each Board member picks a committee member provides a balance of technical expertise and political representation. In the past, this advisory committee had a central role in the project selection process. This responsibility is being pushed down to a series of standing committees that provide oversight for each of the major program areas. The members of these on-going standing committees are also appointed by the Board, with each Board Member allowed one appointment.

The committee structure is flexible in nature, but provides each program area with a "good set of minds" for defining overall directions. The standing committees and program areas evolve slowly over time, with new ones formed and old ones phased out as appropriate. A residential committee, for example, has recently been split into a general residential committee and a low-income committee. Similarly, reflecting new market needs, a new standing committee has been formed to address energy information systems.

Some projects within standing committees will necessitate the formation of an ad hoc committee that is more specialized. For example, to support a new effort in daylighting design, a separate committee has been set up. Funding sources originating from outside the center may also necessitate the establishment of a special oversight committee for a new program area.

Payment for time and expenses is made available to some public interest representatives only, with the remainder paid by their member organizations.

Program Development and Budgeting

The ECW has an annual budget of approximately $5.5 million, of which $3.2 million is available as member's discretionary funds. An annual planning process is used to allocate these funds. Each Standing Committee sets its own strategic objectives. This occurs typically through discussion and consensus, or through a majority vote if necessary. Strategic objectives are put in writing as part of the annual planning process, along with a range for budgets.

Generally, all funds are allocated through the planning process. However, changes over the course of a year generally result in the availability of a small amount of discretionary funds. The availability of funds enables an organization to have greater flexibility, but is difficult to manage from a political perspective. In the next round of budgeting, ECW plans to include a small number of planned set-asides for discretionary purposes.

Promotion and Outreach for Solicitations

Information on all RFPs is available through the ECW website. They find that, over time, people interested in these areas watch their web site and follow the planning process to anticipate and plan for upcoming RFPs. Formal advance notices are not issued. The center also maintains a well-developed bidders list to which e-mail and printed notices are sent. Newspaper notices are not used.

Proposers are generally allowed 4-8 weeks, sometimes longer. Questions that are submitted to the ECW are answered on their web page. Teaming is not facilitated in any formal manner.

Solicitation Process

The ECW uses a two-stage proposal process to flesh out new ideas that are pursued in the form of a detailed RFP. Ideas may come from anywhere, and bids are open to anyone. Approximately 30 percent of proposals originate with the ECW staff. In this stage, a 2-page idea is submitted for review. Projects selected may be either single- or multi-year in scope. Scoping studies and pilot studies may be conducted in-house or contracted. Ideas may be submitted by staff or outsiders, and are scored through a blind review by the program area steering committees.

Last year, 250 ideas were submitted in total. Consistent scoring procedures (short, but well-specified) are in place to review proposals. Proposals are scored and rank ordered as competitive, possibly competitive, and non-competitive. The objective is to develop a more thorough proposal.

Those submitters whose proposals are deemed competitive may then work with staff to formulate a more detailed proposal, which will then serve as the basis for an open RFP. This stage includes a detailed budget estimate, which is then fed into the annual planning process for the upcoming fiscal year.

Projects are then put out to bid through an open RFP process. Ironically, a lot of the RFPs are not actually awarded to the original proposers of the work. Standing Committees review and select both the initial "ideas" and the final proposals. Formal recommendations are submitted to the Executive Director, who has the final call. This is, in part, a formality since the Executive Director will generally address issues during the process and will rarely go against a committee's final decision.

A newer approach being employed by ECW is along the lines of that used by NYSERDA and the Iowa Energy Center – issuing "Program Opportunity Notices." Under this approach, targeted "opportunity areas" are identified and firms may propose to do work in this area and bring in matching funding. The objective of this approach is to leverage the ECW resources through outside investment. The Center as a whole has a goal of increasing the level of "non-member" funding for projects undertaken through the ECW.

Evaluation

Evaluations are conducted for all demonstration projects, using a separate budget. Research projects are not evaluated externally, as this is viewed as part an integral part of the ongoing part of the research process. Some projects involve training programs, and these, too are closely evaluated.

Lessons Learned

- Design programs to meet needs that the marketplace does not already meet.
- Design and publicize an open and broadly targeted solicitation process.
- If the process is implemented by a utility, a member-based committee structure should be put in place. Use this committee structure to build consensus on program offerings.
- Be careful to maintain the autonomy of the committee structure; use caution in over-ruling any committee decisions as this undermines the effectiveness of these committees.
- Take a long-term perspective that will build up the trust of all stakeholders over a number of years. Be prepared to adapt the design as experience is gained.

New York State Energy Research and Development Authority (NYSERDA)

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Mission Statement

The mission for NYSERDA definitely includes the concept of innovation, but it is focused on using innovation to solve problems. Within the mission of NYSERDA, the term innovation connotes "new technology and new systems, and new ways of approaching problems – both in the hardware sense and in the institutional sense to develop innovative systems."

> *"The overall focus of NYSERDA's R&D program is on improving New York State's economic competitiveness and energy efficiency in an environmentally sound manner by maximizing the contribution of the State's renewable and indigenous resources and increasing energy related product development. Through its R&D activity, NYSERDA*

recognizes that energy, the economy, and the environment are linked." (from NYSERDA web site)

Overview of Approach

NYSERDA is interested in helping firms produce, demonstrate, and market innovative technologies. The organization tends to work with the market as it exists in New York. NYSERDA encourages individuals and firms to be innovative by sharing the risk of innovation. The approach that is used encourages innovators to go further than they may be comfortable going on their own by sharing this risk with the innovator. As such, they work extensively with new and small businesses.

Organizational Structure

To support its R&D efforts, NYSERDA has established 6 ("five and 1/2") program areas that tend to be broad and general:

- Buildings
- Industrial
- Transportation
- Resources, including renewable energy
- Environmental
- Distributed generation (new, "1/2 program area")

The structure of NYSERDA has evolved toward these program areas over a long historical process. Each year, a comprehensive planning process is undertaken, during which the relevance of each program area is reviewed and refined as appropriate. During this annual program planning process, drafts of the plan for the upcoming year are sent out to many reviewers for feedback. Input is also solicited from the Board, outside experts, and through a series of workshops. The planning process is open to all people, and during this process, ample opportunity is given for the public and interested individuals to "give their ideas."

Within each of the broad program areas are sub-program areas. The formation of a new sub-program area will typically include a detailed scoping workshop. The individual program managers for each of the sub-program areas undertake program planning.

Occasionally, NYSERDA will embark upon a new major cross-cutting initiative, in which case it will work in partnership with other private- and public-sector organizations.

Program Development and Budgeting

Goals for individual program areas and projects are not very specific. In fact these goals may often be relatively non-quantifiable such as " to work with several new lighting manufacturers that we have not worked with before." In terms of goal setting, they cannot be too precise in goals. Instead, the focus is maintained on the overall objective, which is to obtain the greatest "bang for the buck," as measured by new jobs, economic activity, energy savings, pollution reduction, and a variety of other economic and development metrics. Their "bottom-line" evaluation includes (1) did the start-up succeed, and (2) was the product successful?

Budgeting, too, is somewhat evolutionary and is strongly influenced by previous budgets. As such, budgets tend to be relatively stable year-to-year within the program areas. Specific allocation to

projects occurs within the annual program planning process. In recent years, there has been less and less money available for unspecified topics. In an ideal situation, it would be desirable to reserve monies for unexpected (unsolicited) opportunities, but political pressures require that this be minimized.

Promotion and Outreach for Solicitations

Since NYSERDA has established an annual planning cycle, it is perceived that private industry watch and anticipate the Program Opportunity Notices (PONs). As part of this plan, a schedule is issued well in advance. NYSERDA also maintains an active database of firms and individuals (the database includes a set of interest descriptors), to whom a one-page announcement is sent (approximately 500-1000, depending upon the program area). PONs are also advertised on the NYSERDA web site. The NYSERDA web page seems to be very effective, as people involved in this field are skilled enough to reach these links. A major challenge NYSERDA faces is finding new participants. In program areas that are reasonably well known, the system works well; in other areas, word of mouth contact is very important to reach less well-known entities.

Another important outreach effort involves links to TDOs (Technical Development Organizations). TDOs, supported through funding by the US Commerce Department, operate "close to the ground" and serve as a valuable conduit to innovators. Other links include utility R&D groups and university-based advanced technology programs.

Solicitation Process

Each year, NYSERDA will issue a series of approximately twenty competitive solicitations in sub-program areas (lighting, HVAC, renewables). Multiple proposals are funded, typically for $100,000-500,000. In selecting projects they look for a minimum of a 1:1 ratio of matching funds to program funds. The competitive solicitations that NYSERDA issues are called Project Opportunity Notices (PONs), which are broader and more general solicitations than is implied with an RFP process (which usually is very specific). Proposals can be modified somewhat during the contracting process, but it is important to note that the contracting process in itself is not trivial, but rather was characterized as "difficult and lengthy."

Recently, NYSERDA has moved to a two-stage proposal process. First, there is a pre-proposal, and then a full-proposal stage. To facilitate the screening process, technical evaluation panels are established (one for each PON), consisting of 6-8 members who are internal staff or external reviewers. The technical evaluation panels make recommendations to a management committee. The panel also reviews the initial solicitation document.

Within the proposal preparation process, NYSERDA tends to err on side of "more communication and feedback," as opposed to going out of the way to ensure fairness and competitiveness. The objective is ultimately to ensure successful projects that benefit the State of New York. With $16 million available for contracts, proposals are received for about 3-4 times the amount available. Some of these are clearly not very good.

In terms of balancing risk and success, NYSERDA has established a clear policy – look for near-term success. They do not entertain long-range developmental projects. As a rule of thumb, an innovation that is funded should be in the marketplace within five years.

Since NYSERDA is effectively investing in a firm, the track record, experience, and management team is extremely important. Business plans are examined in detail, and NYSERDA maintains a database of contractor performance on previous projects. A due-diligence process is effectively employed.

Profit From Risk Sharing

NYSERDA receives approximately $1 million in royalty payments, and has a target of $4-5 million. As mentioned above, most of NYSERDA's efforts are predicated on risk sharing. If a project fails, the money is a write-off. If a project succeeds, NYSERDA expects repayment of its initial investment, plus an additional return. This is tough to implement contractually. NYSERDA holds small equity positions in some start-up companies, but they are not sure if this is a trend or not. The advantage of this approach is that it may not be a specific product, but rather the company in which NYSERDA invests, that ultimately succeeds. Having an investment in the company therefore serves to hedge the overall risk. Also, since NYSERDA has a longer-term interest, there is less pressure to take cash out of the company early which, is turn, benefits the long-term development of the business. The major downside to this approach is that it may pose legitimate conflicts of interest manifested through investment practices that are skewed toward companies in which NYSERDA is already invested.

Project Management

After selection, NYSERDA involvement in a project varies. In some cases their staff will be intimately involved, serving effectively as peripheral staff. But this varies with the level of expertise on-staff at NYSERDA. As a minimum, they will visit the company once a year, but this may occur several times a month. Monthly progress reports, and invoices are required of each project. The NYSERDA staff budget is approximately $5 million to support $16 million worth of contracts.

Evaluation

Each proposal requires an evaluation plan to answer the question: "how can we measure your success?" Within NYSERDA, approximately 2 FTEs are devoted to evaluation. In terms of an evaluation, a variety of "metrics" are identified as part of the proposal process and tracked. These may include results from follow-up surveys, or dollar volume of business generated. Often, this evaluation is done in-house specific to each project. Contractors are expected to assist with required data collection, along with the project manager.

Lessons Learned

- Be as market-driven as possible. Avoid attempts to invent programs "in a vacuum."
- Design and implement an open solicitation process, with a significant amount of outreach, in order to ensure quality proposals.

Other Contacts Suggested:

- Iowa Energy Center – Floyd Barwig, Exec. Director 515/294-0111
- Gas Research Institute
- Electric Power Research Institute
- DOE Office of Industrial Technology – Denise Swink, Deputy Assistant Secretary

Rhode Island Renewable Energy Project *(New England Electric System)*

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Mission Statement

The objective of the Rhode Island Renewable Energy Collaborative (RIREC) project is not articulated through a formalized mission statement, but in general it is to:

> *"Help move the market in renewables with key strategic investment in Rhode Island."*

Organizational Structure

In Rhode Island, a portion of the "System Benefit Charge" (SBC) has been allocated to fund the development of renewable energy projects. The utilities have taken a collaborative approach to soliciting and procuring innovative projects to implement under this program. This situation serves as a case study in innovation within the utility context. Although this is officially a collaborative effort among the Rhode Island utilities, NEES has been largely responsible for the implementation of this program.

[NB: In Massachusetts, it is intended that all SBC programs will ultimately be funded through, and implemented by, the Massachusetts Technology Collaborative. However, since the Massachusetts restructuring law is tied up in the courts for the foreseeable future, everything is on hold and nothing has been implemented under this arrangement.]

Overview of Approach

Wherever possible, RIREC has endeavored to identify and fund projects developed using Rhode Island companies and resources. Constraints faced during this process include the fact that a very limited amount of money is available – $2.7 million is available over two years. Thus, one of the guiding implementation principles was to not engage in primary research. As a rule, anything undertaken must be commercially available and implemented somewhere else previously. (In other words, if a demonstration was successful, a customer must be able to call a company and order a similar product for their own use.) Moreover, there was a definite interest in being able to demonstrate results to the Rhode Island Commission.

Program Development and Budgeting

In the year prior to the program, a scoping study was completed to provide an assessment of the state of the art for each renewable technology. This study assembled a panel of experts to develop its recommendations, and was used in formulating the scope of program areas.

In parallel, an additional study had also been conducted to examine photovoltaic (PV) commercialization, looking at cost-effective PV applications that are cost effective within New England.

Aside from the utility staff who manages the program, there is no on-going panel of experts. Instead, program managers have relied upon those firms that submit bids to provide information on the state of the markets.

Solicitation Process

Two sets of solicitations have been developed and issued by the collaborative.

No advance notice was given in the solicitation process, but many of the firms were connected with the planning process and were therefore at least superficially aware of the plans to issue solicitations. Nevertheless, fewer bids were received than were expected.

First, in order to test the market, a broad-based solicitation was developed for general renewable projects. Copies of the solicitation were sent out to approximately 100 individuals and firms included on a list that had been developed as part of the scoping study described above (the list is not updated in any regular fashion). Twelve bids were received through this solicitation:

- wind (3)
- fuel cells (3)
- landfill gas (1)
- PV (5)

A formal scoring process was used to rank proposals. In the scoring process, proposals were judged, to some degree, on a relative basis as opposed to an absolute basis. For example, the scoring process did not look specifically at the probability of success in an absolute sense. Rather, proposals were judged relative to the other proposals submitted. Proposals that simply asked for the maximum amount available were frowned upon, as were proposals for which it seemed unlikely that there would be any customers. Although not specific, matching funds were viewed favorably.

Two proposals resulting from this solicitation were selected very quickly for funding, while another project was asked to modify its proposal and was awarded a contract after approximately 6 months of negotiation.

Following this initial selection of projects, a more targeted solicitation was sent out. This second round of solicitations was used to address specific markets that the collaborative felt was missed in the initial solicitation (*e.g.*, commercial sector PV installation and a fuel cell installation). A demonstration project for outdoor PV lighting was also solicited from a specific manufacturer in order to address a potential market highlighted in the initial scooping study. For example, no proposals were received for PV applications in the commercial sector. Similarly, the fuel cell proposals that were received through the initial solicitation were judged to be inadequate and were addressed through a more targeted RFP.

Most of the available money has been committed, but it is unlikely that all of the money will be spent. This is because a lot of the projects simply are not going to happen as intended. For example, proposal submittals were optimistic that they could sell residential fuel cell systems and asked for a relatively small funding commitment from the collaborative. However, the realities of the marketplace have shown that it is much more difficult than expected. Similarly, due to difficulties associated with local permitting processes, it appears unlikely that a wind power project will actually come to fruition (a project constituting $500,000 or nearly 20% of the available funds).

Evaluation

In terms of project evaluation, plans have not yet been specified for the collaborative. At this point, since the effort is just getting under way, the emphasis is on simply getting the projects up and running. While they expect that an evaluation effort will ultimately be undertaken, it is expected that this will have an R&D focus rather than attempting to measure specific kWh "savings" per se.

Lessons Learned

While, in hindsight, they understand that their initial solicitation could have been more closely targeted, the broad solicitation was viewed as a necessary step in seeing what the market could readily provide.

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