



**PIER Distributed Energy Resources (DER)
Integration Research Program Advisory
Committee
2002-2003 Program Advisory Committee
Annual Report**

CONSULTANT REPORT

Prepared For:

California Energy Commission
Public Interest Energy Research Program

Prepared By:

Navigant Consulting, Inc.

Prepared By:

Navigant Consulting, Inc.
Stanley Blazewicz
Burlington, MA
Contract No. 500-02-019

Prepared For:

California Energy Commission

Mark Rawson
Project Manager

Laurie ten Hope
Program Team Lead
PIER Energy Systems Integration

Marwan Masri
Deputy Director
Technology Systems Division

Robert L. Therkelsen
Executive Director

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1.0 Introduction

The Public Interest Energy Research (PIER) Program was established in 1996 as part of new legislation that includes a requirement that at least \$62.5 million be collected annually from investor-owned utility ratepayers for "public interest" energy research and development efforts that are not adequately provided by competitive and regulated markets.

The Energy Systems Integration (ESI) Program Area within PIER at the California Energy Commission (CEC) is committed to the development of technologies that are crosscutting and strategically relevant between PIER's various program areas.

Distributed Energy Resources (DER) Integration has been identified as a particularly important part of the ESI Program Area given its applicability to many areas of research pursued throughout PIER and its potentially revolutionary impact on the energy generation and delivery infrastructure. ESI DER Integration activities currently include a portfolio of 11 projects with a total estimated budget requirement of over \$8 million for the lifetime of these projects.

The Program Advisory Committee (PAC or the "Committee") was established to provide guidance to the DER Integration Research Program (the "Program") to help make the Program a success. Success here is defined as a focused, cohesive, effective program that is aligned with the PIER Program's goals and ultimately provides benefits to California electricity ratepayers. Mark Rawson, the program manager for the DER Integration Research Program, serves as the coordinator of the Program Advisory Committee and its key point of contact.

1.1. Role of the Program Advisory Committee

The Program Advisory Committee is tasked with providing critical reviews of the Program and projects, extend the reach of the Program with the members' expertise and network, and market the Program through increased public visibility. Critical reviews of the DER Integration Research Program and its projects involve assessing the Program's progress in connection with the intended objects and the subsequent appropriateness of its current portfolio of projects. The Committee enhances current projects by providing direction and feedback as well as identifying linkages with other activities, both internal and external to the CEC. The PAC acts as an extension of the DER Integration Research Program by tapping into the members' expertise and network. Brainstorming for projects addressing new needs, innovative approaches to technical issues and project implementation, and leveraging existing work and other resources is a regular Committee exercise. The group can provide linkages and communications to efforts throughout the DER stakeholder community, forming the base of an effective marketing platform for the Program.

1.2. Responsibilities of the Advisory Committee and Committee Members

PAC members have significant responsibilities to their stakeholders as well as to the Committee itself. Members must represent and communicate needs of their particular DER stakeholder group and are expected to be unbiased and represent what is in the best interest of their stakeholder group rather than that of their own companies or organizations. Committee members are not allowed to participate on DER Integration Research Program projects during their tenure and for one year following their tenure. Members will provide critical input and support for the DER Integration Research Program and DER in California. Membership

requires a one-year commitment during which time members are expected to attend and actively participate in the quarterly meetings.

1.3. Composition of the 2002-2003 Program Advisory Committee

The 2002-2003 DER Integration Research Program Advisory Committee members were selected based on their diverse backgrounds and ability to represent different stakeholder perspectives toward the work undertaken by the Program. The six members of the PAC are listed below.

Scott Castelaz - Encorp

Thomas Dossey - Southern California Edison

Patricia Hoffman - U.S. Department of Energy

Thomas Hunton - ASE Americas

G. Rodney Sluyter – Verizon (retired), RS Consulting

Valerie Beck – California Public Utilities Commission (joined June 3, 2003)

2.0 Overview of 2002-2003 Program Advisory Committee Activities

Three meetings and two conference calls were held over the course of the 2002-2003 term for the DER Integration Research Program Advisory Committee. The meetings provided a forum for PAC members to share their insights and opinions through structured discussions that covered topics ranging from Program project portfolio considerations to opportunities for collaborating with outside organizations. Conference calls between the meetings served to enhance communication by allowing the program manager, Mark Rawson, to provide the Committee with updates of Program activities and the PAC members with the opportunity to exchange news and developments that may impact the Program and their respective stakeholder groups.

2.1. September 18, 2002 Introductory Meeting in Sacramento, CA

This meeting laid out the roles and responsibilities for the PAC members and was the forum where the initial set of suggestions and guidance was obtained from the members.

- An overview of the DER Integration Research Program and current Program activities were presented.
- The program planning tools were presented and feedback was obtained from the Committee members.
- Discussions were held around outside opportunities and noteworthy trends that are potentially applicable to the Program.
- The procedures and dynamics of the Committee were discussed and specific recommendations were captured.
- Meeting minutes were compiled and distributed to the PAC members.

2.2. November 7, 2002 Conference Call

The Committee reviewed the DER Integration Research Program's vision and began discussions on the Program's roadmap that lays out the path for making strides toward that vision.

2.3. December 3-4, 2002 Meeting in Sacramento, CA

This meeting provided the Committee with an opportunity to further engage in the goals and challenges confronting the DER Integration Research Program. The first half-day session focused on the Program's project portfolio building effort and an update on the DER roadmap.

- Committee members were briefed on the current activities of the Program.
- A portfolio balancing exercise was conducted whereby Committee members provided insights and perspectives on what would be the most appropriate set of activities for the Program to undertake given various metrics.
- Adjustments made to the roadmap after the previous conference call was discussed and additional suggestions were obtained.

The second day's activities focused on the evaluation of the Program's activities in Rule 21 development and possible application of DER in local economic development.

- The objectives of PIER's activities in Rule 21 development were analyzed and the appropriateness of various measures of success was discussed.

- Opportunities for DER in local economic development were explored with the Committee.
- Meeting minutes were compiled and distributed to the PAC members.

2.4. February 27, 2003 Conference Call

The Committee was briefed on the latest developments in the DER Integration Research Program and a discussion took place discussing new industry developments.

2.5. June 3, 2003 Meeting in Sacramento, CA

At this meeting, external collaboration and responses to potential crisis scenarios were the key topics of discussion. As the Committee moves closer towards the end of the 2002-2003 term, this meeting also served as an opportunity to reflect on the dynamics of the Committee and prepare for the transition into the 2003-2004 term.

- Committee members were briefed on the current activities of the Program.
- An external collaboration discussion took place, identifying potential groups and entities which whom the DER Integration Research Program could collaborate and analyzing the potential significance of the relationships. The discussion covered both public sector and private sector entities.
- Techniques for effective management external collaboration and pitfalls to avoid were identified.
- The “Bad Summer” Scenario exercise identified potential responses for the Program to minimize the negative impact of a severe electricity supply shortfall during the peak summer months.
- The “Financial Crisis” Scenario exercise identified potential responses for the Program to minimize the negative impact of a severe budget reduction across California state agencies.
- Areas for improvement were identified for Committee procedures and operations.
- Meeting minutes were compiled and distributed to the PAC members.

3.0 Findings and Recommendations

This section provides a summary of the key findings and recommendations of the DER Integration Research Program Advisory Committee during the 2002-2003 term.

3.1. Overall Program

Throughout the year the Program Advisory Committee provided input into the appropriate scope and focus of the DER Integration Research Program. The Committee expressed that the Program should have an active marketing effort. In addition, the Committee suggested the Program consider a role in the area of economic development and helped examine that potential role.

3.1.1. Program's Scope and Focus

- DER should be a formal program within PIER, not just an interest area under the different PIER programs.
- The PIER Program should address Combined Heat and Power (CHP) issues. Some PAC members suggested that they might fit best in the DER Integration Research Program since they are addressing systems integration issues.
- The Program's three highest priority initiatives are very long term. There is a need to incorporate initiatives with near-term impact to utilities, suppliers and consumers. The Program shouldn't focus only on long-term projects. It needs to close research gaps quickly and develop results that can be implemented. One option is to phase projects so that they start producing results that can be implemented while the research continues.
- Program should not try to over-think technology solutions. It is best to try things and learn from experience.
- The Program should continue to look beyond the technologies and consider other drivers. Some key drivers identified by the Program Advisory Committee include net metering, time of use pricing rate structures, and regional pricing that would provide incentives for DER installation in areas of higher benefit.

3.1.2. Marketing the Program

- The Program focus is deemed appropriate, but ratepayers will need to see the application of technologies developed. The Program will need to promote awareness of how the results of its research efforts are being applied. It must establish pathways to implementation for research projects that are more theoretical.
- The Program is initiating change in the industry and it should communicate what is changing, why it is important and what opportunities it brings. The Program needs to define and spread awareness of its vision.
- The Program will need to identify and communicate/market milestones along the path from today's situation to the end vision. It will need to show that progress is being made towards the vision and share this plan (i.e., roadmap) with others, at least within PIER.

3.1.3. Role in Local Economic Development

- Local governments care about having keeping their lights on and clean energy. Many are currently installing PV on school roofs, hybrid power systems, etc. and could benefit from the results of DER Integration research.
- Mayors are interested in using DER to enhance economic development (e.g., microgrids to help impoverished neighborhoods attract businesses).
- The priority should be to demonstrate potential value. Municipal utility service areas would be the most appropriate for such demonstrations.
- Local economic development is not considered to be an integral part of this program, but is an important factor for other groups within the CEC.

3.2. Guidance on Projects

The Committee provided input to the program manager on the Program's portfolio, roadmap and individual projects. The PAC provided guidance on the Program's portfolio in two ways: direct input on the project portfolio and through a portfolio balancing exercise. The Program's DER roadmap was also reviewed based on the input was provided to the program manager from Rule 21 development activities.

3.2.1. Input to the Project Portfolio (September 2002)

At the Introductory Meeting in September 2002 the Committee provided the following comments on the DER Integration Research Program's Portfolio:

- The Program's portfolio of projects is in line with expectations.
- The Program is assuming DER is good. This is an appropriate initial hypothesis to be validated through research. Research will provide analytics for policy discussion and decisions that will be external to the DER Integration Research Program since policymaking lies outside the legislative authority given to the PIER Program.
- PIER research is valuable because it provides unbiased insight on DER implications. It has no vested interest like utilities, energy services companies, and equipment manufacturers.
- The Program should avoid being spread too thin across research areas and should carefully select issues and focus.
- Market mechanisms to be developed should capture and monetize negative implications of DER, not just benefits.
- Utilities are very interested in demonstrations and tests of DER penetration in distribution systems. Their engineers do not have a good understanding of the implications. The Program should extend the scope of research initiatives to include design recommendations for distribution systems to be "DER friendly".
- The Program is playing an important unbiased role in publishing the guidebook for interconnection. For some stakeholders, the interconnection process is not getting easier in California. There's a need to address not only technical issues, but process and regulatory issues as well. The guidebook needs to cover a wide-range of prime mover technologies.
- Have regional solutions pilots identify opportunities to improve Rule 21. Get strategic partners involved in implementation based on the findings.

- The interconnection problem goes beyond a lack of education. There is a need to streamline the application process.

3.2.2. Exercise: Balancing the Portfolio

At the December 2002 meeting, the Committee performed a portfolio balancing exercise. The objective of this exercise was to solicit input from the various stakeholders, represented by the PAC members, on how the Program’s project portfolio should be balanced. Each member was given a “budget” of \$10 million and asked how he/she would invest this “budget”. Portfolio characteristics that were considered included:

- Research Area
- Time to Impact
- Project Size
- Development Stage
- Competitive Impact

Table 1. Research Area (Interconnection, Grid Effects, Market Integration)

Portfolio Issue: Research Area			
Stakeholder	Interconnection	Grid Effects	Market Integration
Consumers	\$4 MM	\$1 MM	\$5 MM
Utilities	\$3 MM	\$5 MM	\$2 MM
Private Sector: Tech Company	\$2 MM	\$4 MM	\$4 MM

- The Research Area characteristic saw the largest differences of opinion among Committee members. This was not unexpected given that each Committee member is representing a different stakeholder group with a unique set of concerns: consumers need the market structure to make it attractive, utilities need to protect the grid, and equipment manufacturers sell their products based on benefits to consumers and the system.
- Consumers focus on Market Integration. A large effort and much investment is needed to change the status quo from the centralized system paradigm. This is a complex problem and will require a “catastrophic” breakdown of the existing system to make the case for market integration of DER sufficiently compelling. Consumers are not terribly concerned about the concept of benefits to the market or system, but they do care about their own costs and quality of service. There are multiple avenues to create market structures for DER that are independent of grid effects. It is also important to make sure DER works.

Reliability is a key value. Interconnection and Grid effects are tied together in this role as secondary focus.

- Utilities focus on Grid Effects. This is the utilities’ business. They are in the status quo business. Market forces will take care of Market Integration. New technologies that are cost competitive with central power generation are required in order to successfully bring DER into the market. Utilities will need a regulatory/legislative shift to make them embrace DER. Interconnection and Market Integration are interrelated.
- Equipment manufacturers focus on Grid Effects and Market Integration. They sell into both areas. Thus far, the market has not been able to fully address Market Integration concerns. Moreover, the “bottom line” is that most electricity will continue to come from the grid. Grid Effects and Market Integration are interrelated. Interconnection already has much momentum on the institutional front.

Table 2. Time to Impact (Near Term <5yrs, Medium Term 5-15 yrs, Long Term +15 yrs)

Portfolio Issue: Time to Impact			
Stakeholder	Near Term <5 yrs	Medium Term 5-15 yrs	Long Term +15 yrs
Consumers	\$6 MM	\$3 MM	\$3 MM
Utilities	\$6 MM	\$3 MM	\$1 MM
Private Sector: Tech Company	\$6 MM	\$4 MM	\$0

- All Committee members agree that Near Term projects should be the primary focus, with some Medium Term projects (preferably under 10 yrs to impact), and little Long Term research. The “sweet spot” is in the 3-5 year range.
- DER is “ripe” for action now and there are security benefits to capture initially.
- DER integration efforts would not overlap with private sector activities, and there are opportunities to work together.
- Anything beyond 15 years falls in the “faith” category since accurate forecasting is terribly difficult. As a regulated industry, the electricity industry has many other variables that may cause deviations from the expected path of technology development over the long term. Other entities such as forward thinking research foundations are doing this type of research.
- There is a need to act now or the opportunity for DER to make an impact could disappear.

Table 3. Project Size (Small <\$500k, Medium \$500k-\$1MM, Large +\$1MM)

Portfolio Issue: Project Size			
Stakeholder	Small <\$500k	Medium \$500k - \$1MM	Large +\$1MM
Consumers	\$6 MM	\$3 MM	\$1 MM
Utilities	\$4 MM	\$3 MM	\$3 MM
Private Sector: Tech Company	\$1 MM	\$3 MM	\$6 MM

- Committee members were consistent in their recommendation to avoid large projects without clear exit options. Large projects should be broken down into phases with go/no-go decision points over time.
- Project size should not be a key criterion to evaluate projects. The Program should first prioritize what is important and then spend what is necessary.
- It is important to conduct projects that create real value, not just thoughtful paper studies that do not lead to anything actionable.
- Avoid the natural tendency to make projects larger than they need to be.
- Large projects will usually require several smaller projects as follow up.
- It is important to focus, and not spread the Program too thin. At the same time, the Program should not try to solve everything in one shot.
- Co-funding projects can mitigate the risk and allow larger projects into the portfolio.

Table 4. Development Stage (Commercial, Demonstration, Development, Research)

Portfolio Issue: Development Stage				
Stakeholder	Commercial	Demonstration	Development	Research
Consumers	\$1 MM	\$2 MM	\$3 MM	\$4 MM
Utilities	\$0	\$3 MM	\$5 MM	\$2 MM
Private Sector: Tech Company	\$2 MM	\$3 MM	\$3 MM	\$2 MM

- There was consistency among PAC members regarding the need to focus on Demonstration and Development.
- Demonstrations are expensive, but valuable. Significant amounts of Research has already been done.
- Guidelines and standards are appropriate projects for the Program and create a lot value. Outreach is very important. The Program needs to make consumers feel that they are the beneficiaries of the Program's efforts and incorporate the consumers' needs (e.g., via focus groups) into the portfolio of projects.
- Commercializing DER is not an objective of this program. Other state programs are already doing this (e.g., solar). The Program should not behave like a venture capital firm.

Table 5. Competitive Impact (Base, Key, Pacing, Emerging)

Portfolio Issue: Competitive Impact				
Stakeholder	Base	Key	Pacing	Emerging
Consumers	\$0	\$1 MM	\$8 MM	\$1 MM
Utilities	\$1 MM	\$3 MM	\$4 MM	\$2 MM
Private Sector: Tech Company	\$1 MM	\$2 MM	\$5 MM	\$2 MM

- Committee members agreed on the need to focus on Pacing activities.
- DER Integration should focus on issues that will have a significant impact across the industry rather than specific stakeholders.
- There should be an emphasis on what is not being done by the private sector.
- Find and support research into areas that could prove to be paradigm shifters.
- There are no Pacing projects in the current portfolio. There is a need to add Pacing projects.

3.2.3. Roadmap Completeness

In response to a recommendation at the Introductory Meeting, the DER Integration Research Program developed a roadmap to better explain the Program's vision and how the projects worked together along a timeline to achieve those objectives. The Committee provided the following comments via a conference call November 7, 2002:

- Overall, the roadmap is aligned with the current issues that DER needs to overcome.
- It is important to integrate the DER Integration Research Program's DER roadmap with DER roadmaps of other PIER programs, other CEC programs, other California state agencies, and other government research programs (e.g., DOE).
- It is important to work on dual fuel technologies (under this or other PIER programs).

- Regulatory Issues appears to be a missing research area. There is a need to perform research that supports regulation and policy decisions.
- Adding power electronics, power exporting and CHP to the scope of the New Power Technologies project may prove useful.
- A tool to estimate the benefits of DER to transmission and distribution system in California is needed.

3.2.4. Metrics to Evaluate Success of Rule 21 Project

The program manager asked the Committee to provide input on the Rule 21 effort that is working to standardize the interconnection of DER into the electric grid. Particular attention was paid to the development of metrics to evaluate the success of the Rule 21 effort. The Committee provided the following comments:

- Rule 21's success should be measured by the satisfaction of applicants, not simply by measuring cost and time broken down into different steps along the process. Customer satisfaction surveys would be a useful (and better) tool.
- It will be difficult to evaluate cost and time reduction goals, as there is little historical data with which to compare.
- California utilities are currently collecting data in different ways. Utilities don't want to spend any additional resources on DER.
- The best path to get utilities to reduce cost and time of interconnection is through regulation.
- Still, some metrics are needed to manage or improve the process. Measurement focus should not be just interconnection application, but the entire process from the time decisions are made until the equipment is up and running.
- Timing of interconnection application is critical if it is part of the critical path of the overall project.
- Educating customers and utility protection and distribution engineers would significantly improve the process.
- Rule 21 is doing little for interconnections over 1 MW. There is a need to do more work and conduct more studies on these.

3.3. Partnering

The Program Advisory Committee provided guidance to the DER Integration Research Program on partnering including prioritizing partnerships and mechanisms for partnering. The Committee provided general guidance on partnering throughout the year and also participated in formal exercises to identify and prioritize partners, and structuring these partnerships.

3.3.1. Opportunities to Leverage the Program's Research Activities

The Program Advisory Committee provided suggestions on how to make the most of the research activities being supported by the DER Integration Research Program through external relationships.

- The Committee members can take research results to their industry network and promote rapid implementation among early adopters.
- Establish a co-funding pattern with DOE.
- Build partnerships with other state agencies such as NYSERDA by finding a small core of counterparts with whom the Program can build a relationship.
- Contact different organizations and look for opportunities to collaborate, act on research results, implement technologies, etc:
 - o Regional development agencies
 - o Real estate community
 - o Development companies (e.g., Real Energy)
 - o DER interest groups / lobby groups
 - o Manufacturers – supply equipment for demonstrations
 - o EPA – get their weight behind DER efforts
 - o Landfills in CA that can become generation parks
 - o Encourage owners of fossil fuel DER to buy bio fuel and/or take other actions to become cleaner (i.e., bridging strategies)

3.3.2. Collaboration Issues

The PAC acknowledged that there is value to collaboration but warned of potential issues and how to avoid or manage these issues.

Public vs. Private Interests

- While public and private interests don't always overlap, there is significant alignment in shared interests.
- Requiring all information to be made public reduces concerns over unfair distribution of benefits.
- State tax incentives to encourage private sector investment in public interest research would help development of DER.

Maximizing Value of Relationships

- Relationships should be periodically reviewed. A review of partnerships every six months allows for more effective relationship management.
- Companies do think beyond the bottom line. Public relations and involvement in new technologies may bring significant value to some companies. Private sector participants can benefit by building a reputation as a good partner for public interest research.
- Partnership maintenance requires money and time, so prioritization of partnerships to address California issues is critical.
- Build appropriate expectations upfront with partners by using the following:
 - o Guidelines
 - o Regular communications
 - o Accountability
- Trust your partners, but verify to ensure follow-through on commitments.

Managing Co-Funded External Collaboration Efforts

Co-funded collaboration efforts should be done with staged investments tied to budgets & progress and include:

- Timely follow-up
- Escape clauses for all co-funding parties that are clear
- Discreet measurements that allow all co-funders to understand if the project is delivering the expected value

3.3.3. Exercise: Identifying Appropriate Levels of Collaboration

Using the following figure as a guide, the PAC members provided their thoughts on the appropriate level of collaboration DER Integration should try and establish with various public and private sector entities.

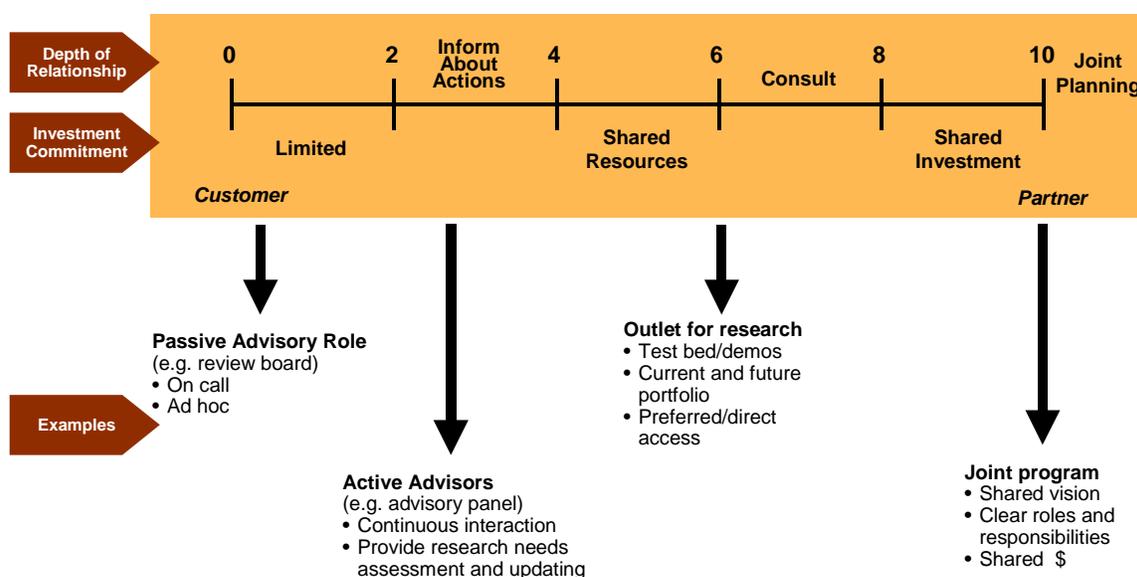


Figure 1 Collaboration Guideline

CPUC

Objective: Integrate input on rate design and cost/benefits of DER. Work to understand what the CPUC needs to know.

Depth of Relationship: Depth may range from consult to joint planning, and overall commitment will most likely be in the 6-8 range.

ISO

Objective: Improve understanding of how to use DER in grid operations and implement DER concepts.

Other State Regulators

Objective: Share insights, possible through NARUC.

Depth of Relationship: 0-2 generally, but 2-4 in selected areas of common interest.

NYSERDA

Objective: Share information since NYSERDA is trying to address many of the same issues as the DER Integration Research Program, and explore opportunities to leverage funding.

Depth of Relationship: NYSERDA is a natural place to start exploring new partnership opportunities. Joint planning is a possibility. PIER is already joint funding E2I with NYSERDA. There is potential for a relationship on the 8-10 level.

Other State Research Organizations (e.g., Massachusetts, New Jersey, Hawaii, and Connecticut)

Massachusetts: networks

Connecticut: microgrids (DOE)

Pennsylvania: interconnection lab

Objective: Take advantage of their existing funding and share information. See if California concerns are being reflected by the efforts of these other states. An example would be the STAC Solicitation led by Sara Ward of Ohio.

Universities (e.g., Univ. of Maryland, Univ. of Wisconsin, UC Irvine, Univ. of Buffalo, Univ. of Chicago, MIT, and Georgia Tech)

Objective: Similar to other states research organizations in sharing information and review of each other's activities. Universities can act as a mechanism for research projects.

Depth of Relationship: 2-4 range

International research groups (IEE, IEA, Japanese researchers)

Objective: Some groups may have research interests similar to PIER

- Networking
- Interconnection
- CHP

The DER Integration Research Program should at least be aware of their activities

GTI

GTI is involved in the City of the Future design for San Diego. GTI may be a viable partner for DER implementation. They can be approached in the same way that the DER Integration Research Program would approach EPRI or E2I. GTI operates an Energy Solutions Center.

NRECA and APPA (co-ops and munis)

They are conducting demonstration of DER benefits and are active in DER application development. There are significant opportunities for information sharing and leveraging R&D \$, possibly up to the level 10 on our scale. Improved joint planning is needed and a coordinated multi-year program plan would strengthen linkages.

Schools

Publicity and education regarding the energy issues is important in building awareness.

Utilities (gas and electric)

- DER must integrate with the system to benefit the public
- Utilities can offer their resources to provide a test bed for research
- Work with electric utilities by continuing to build on DER successes
- Work with gas utilities to design efficient systems for fuel delivery

Telecom Utilities

- Telecom utilities can be involved in interconnection control as suppliers of service and equipment while their high reliability needs make them an interesting electricity customer group to study.
- Depth: depends on need

Manufacturers

DER Integration should encourage manufacturers' participation given their role as major end users and their potential in testing for DER adoption.

Venture Capital/Financial

- Contacts could provide perspective as a passive advisor (0-2)
- Linkage with portfolio companies could at least give information about activities (2+)

Independent Power Producers (IPPs)

DER is a potential paradigm shift for IPPs, and working with them may provide valuable insight.

3.4. Preparing for Crises

The DER Integration Research Program could be faced with severe crises over the next two years that could provide challenges and opportunities to the Program. The PAC participated in two scenario exercises to assist the program manager in preparing for these crises.

3.4.1. "Bad Summer" Scenario Exercise

In this scenario, hot weather, high production costs, a system in disrepair, along with environmental and political pressures combine to threaten a new energy crisis in the California. Suggestions were solicited from PAC members on what the DER Integration Research Program should do to cope with the situation.

Priorities for the DER Integration Research Program:

- There is an enormous opportunity for the DER Integration Research Program to help provide a path forward out of the mess. However, the Program can do very little after the scenario arises, so planning to minimize the impact of such a scenario must begin now.
- Educating the public about the problem and possible solutions is a priority.
- Don't oversell DER. There are no silver bullet solutions to the problems presented by such a scenario.

How the DER Integration Research Program should prepare:

- Build visibility and awareness for DER and the Program:
 - Outreach/PR
 - Build contacts now that will be needed to implement solutions during the crisis
- Shift to shorter term goals and work on attainable goals given time constraints
- Enhance education and outreach to minimize the impact of the scenario.
- Look into using reciprocating engines, and addressing barriers to use (learn from previous PIER work on backup utility generators).
- Accelerate programs that will help reduce the likelihood of this scenario.
- Encourage rates that enable customers to voluntarily shed load rather than central command and control.
- Understand the environmental impacts of various penetration levels of DER and backup generation.
- Develop system to deploy DER and backup generation in a coordinated manner.
- Reexamine the Rule 21 priority list to factor in contingencies such as this scenario.
- Integrate DER into building codes (e.g., smart homes) so that DER can be more readily applied when the threat of power outages arises.

Impact on partners:

- Some partners (i.e., utilities) will be under greater pressure than others.
- Utilities are on the front line and the DER Integration Research Program may not be able to do much to help their situation.

How partnerships can help:

- Solicit partner involvement to aid in outreach efforts now.
- Partner with Air Quality Management Districts/Air Pollution Control Districts to manage the problem while minimizing environmental impact by selectively deploying BUGs.

3.4.2. “Financial Crisis” Scenario Exercise

In this scenario, the California budget situation forces cuts in the PIER Program. The Committee members were asked to provide suggestions on how the DER Integration Research Program can best weather the hypothetical period of reduced funding.

Priorities for the DER Integration Research Program:

- Develop logic steps for action the Program can take as the financial crisis develops. Consider stopping individual projects rather than making across-the-board cuts.
- Protect the critical projects. Answer: “What is the next hurdle that research need to address?” to maximize impact with remaining budget.
- Focus on the “right” efforts so as not to be caught funding second tier priorities while top tier priorities are ignored.

How the DER Integration Research Program should prepare:

- Get visible DOE support for the DER Integration Research Program.

- Increased awareness of the Program can make cutting funding more difficult
 - Educate people on the energy issues and how DER can help
 - Communicate success stories to a larger audience

Impact on partners:

- This scenario creates a tough situation for partnerships.
- Pact among research organizations (e.g., a critical mass of other state organizations along with DOE) to cover each other and continue moving toward a common goal would help keep the initiatives moving.
- Good visible partnerships can make funding cuts more difficult.

How partnerships can help:

- Rally public support.
- Rally political support.

3.5. Advisory Committee Process Improvement

Throughout the year, the Committee provided input on how to improve its processes and on how members could work better together and with the program manager.

- The PAC can provide more value by looking at the project portfolio and planned projects than at commenting on the process that ESI used to get there. The process looks sound and is one the Committee can trust.
- It might be interesting to allow Committee members to prioritize initiatives, as they represent different stakeholder groups and have different perspectives (Note: See portfolio balancing exercise)
- Committee members would like to understand project funding request process (Note: the Committee members were provided documentation that explained this process in detail)
- For individual project review, provide summary description and detailed information only on issues/problems where Committee review is desired.
- As the Committee gets more comfortable and knowledgeable about the Program, it may be appropriate to go into more detail on some of the projects. Committee members would like to see the approach the Program is taking on selected projects (e.g. project objectives, duration, scope, analysis vs. demo, method of implementation, etc.).
- PAC members would like to see a Gantt or flow chart of elements that would need to happen to achieve vision (i.e., roadmap-See Roadmap Completeness review).
- There is a need to develop measures to quantify if projects are successful.
- There is a need to develop mechanisms to evaluate progress towards objectives.

4.0 Plans for 2003-2004 Program Advisory Committee

Going forward, the DER Integration Research Program Advisory Committee will continue to provide guidance for the DER Integration Research Program's activities. The Committee will assist the Program in developing and strengthening relationships with the private sector, where appropriate, as well as peer institutions at the state and federal level. The third area of focus in the coming year is to identify and execute opportunities to build awareness of DER opportunities and challenges in California as well as the efforts of the DER Integration Research Program. Members of the 2002-2003 PAC who are unable to effectively continue serving or choose not to continue serving on the Committee will be given the opportunity to step down. Where appropriate, new Committee members will be introduced to ensure that perspectives from a diverse set of stakeholders are represented.

4.1. Program Guidance

The DER Integration Research Program Advisory Committee will continue to bring valued perspectives on the past, current and future activities of the Program. As has been the case in the 2002-2003 term, flexibly responding to changing external conditions as well as Program and Committee needs will drive the content of the discussions and the agendas for meetings and conference calls.

Committee members will continue to provide input in the manner in which the Program Advisory Committee operates. Lessons learned from the transfer from the 2002-2003 PAC to the 2003-2004 PAC will be captured to pave the way for consistently smooth transfers of information and responsibility from one Committee group to the next.

4.2. Alliance Building

The Committee will strengthen its role as a bridge between PIER ESI and other stakeholders, both public and private sector, that are active in the development of DER. Procedures for varying levels of collaboration will be developed to ensure consistent and effective relationship management.

4.3. Awareness and Education

In the coming year, the Committee will assist the Program in identifying new opportunities to promote awareness of DER technology and challenges. The Program seeks to identify creative opportunities to bridge the information gap between the core DER industry stakeholders and the general public in California.