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LEVERAGING AND INSTITUTION BUILDING BENEFITS OF U.S. DEPARTMENT OF ENERGY'S STATE PARTNERSHIP PROGRAM

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SUMMARY

The purpose of this project is to assess the leveraging and institution building benefits of the U.S. Department of Energy (DOE) State Industry of the Future (SIOF) Program. Under this program, DOE provides grants to states to help deliver the accomplishments of the national Industries of the Future Program to the local level. Staff in fifteen states with SIOF Program grants were contacted to learn about their programs. Additionally, numerous industry representatives associated with these state programs were also contacted to gather their views about the program. The results of this project suggest that the SIOF Program is active, vigorous, and productive. State program staff have been extremely energetic and successful in pursuing their goals of building state-level partnerships among stakeholders in the private sector, government and universities. Barriers to trust have been overcome. Private sector participants have acknowledged receiving value from their participation. In a few states, rigorous R&D programs have taken off, where universities are working on technological issues to help firms in their states better compete in the marketplace. For example, projects in both Kentucky and West Virginia focused on improving aluminum manufacturing processes and the quality of the aluminum produced.

The state programs have leveraged a substantial amount of funding for R&D, specific events, and program operations. Total leveraged resources for programs in states included in this assessment exceed $67 million. Most importantly, of this total more than $38 million was from non-federal funds. The DOE SEP grants to these states from 1999 through 2001 were $4.83 million. This provides a ratio of $8 to every DOE $1 spent on the state partnership program. Comments made by participants indicate that almost none of the leveraged resources would have been obtained without the SIOF resources. Additionally, it should be noted that the leveraged funding cannot be considered as substitutable for SIOF funding. This is because a vast majority of the leveraged funds were for specific R&D projects and targeted events instead of for program operations. Leveraged funds to support SIOF program operations were very small in magnitude and would probably not have been provided at all without the DOE grants. Even in states that have experienced successes in specific industries, SIOF funding allows those states to continue to develop programs in other industries of the future.

For various reasons, the market has not provided these types of benefits to the private sector participants in these state programs. Indeed, program participants complimented the SIOF program for, among other things: helping to create a mutually beneficial foundation of cooperation among partners (government, firms, universities) that markets tend to discourage; providing R&D funds for projects that industries and/or small companies could not afford to undertake by themselves; providing technical information to small businesses that do not have the manpower, expertise and/or resources to acquire the information by themselves; providing unbiased information to the private sector that, among other benefits, helps firms deal more effectively with vendors; and helping to bridge the gap between the development of new technologies in the laboratory and commercialization of the technologies.

The success of most SIOF Programs is a fragile commodity at this point in time. State programs that might lose their SIOF grants from one year to the next are in danger of disappearing, along with the partnerships they worked hard to form. This is because, as pointed out above, leveraged funds cannot substitute for DOE grants that support program operations. Thus, assurances of continued funding to maintain institutional relationships is a key to continued SIOF Program success. For programs that are building program components to rely on external funding, SIOF funding provides the "glue" for the partnerships and facilitates the ongoing dialogue across all players in the industry, fostering planning and prioritization of research and other activities to benefit the industrial sector rather than a single player. State program staff expressed desires to be able to extend the program beyond designated industries of the future to encompass other industries important in their states, and to be able focus on energy as a

component of industrial productivity, along with other issues such as environmental protection, training, and safety.

1. INTRODUCTION

The purpose of this project is to assess the leveraging and institution building benefits of the U.S. Department of Energy State Industry of the Future (SIOF) Program. As stated on the SIOF website, the mission of the SIOF Program is to "deliver the accomplishments of the national Industries of the Future strategy to the local level. The idea is not to recreate national efforts, but rather to expand these opportunities to a larger number of partners and reach smaller businesses and manufacturers that were not initially involved in the IOF effort. The program brings together industry, academia, and state agencies to address the important issues confronting industry in the state. These public-private coalitions facilitate industry solutions locally and enhance economic development."[1]

The SIOF Program provides annual grants to states to help build partnerships at the state level to benefit firms whose activities fall within the purview of the designated industries of the future. These industries include agriculture[2], aluminum, chemicals, forest products, glass, metals casting, mining, petroleum and steel. The public-private partnerships bring information and expertise to firms in the states while also involving university researchers in projects to improve manufacturing technologies that, in turn, will help states' firms compete in the global marketplace. For example, R&D projects in Kentucky and West Virginia have focused on improving aluminum manufacturing processes and the quality of aluminum produced. The Program began in 1998, when it made its first awards. In 2002, twenty-five states received SIOF Program Awards.

The question addressed by this project is what progress is being made by the states in developing the public-private sector partnerships. To answer this question, staff in fifteen states with SIOF Program grants were contacted to learn about their programs. (Contact information for the leaders of these activities is included in an appendix.) Additionally, numerous industry representatives in those states were also contacted to gather their views of the program. The research approach is presented in more detail in the next section. The results of the project are presented in Section 3. Among the conclusions presented in Section 4 are that the state programs are quite active, strong public-private sector partnerships are forming, and states have leveraged their DOE-supplied SIOF grants to attract a substantial amount of additional funding.

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[1]See http://www.oit.doe.gov/states/

[2]At the time of these grants, agriculture was a component of the Industries of the Future strategy. Now, agriculture is part of DOE's biomass program.

2. EVALUATION APPROACH

The basic approach was to contact staff in states that have had active SIOF programs to collect information about leveraged resources and the value of the partnerships. Initial contacts were the state agencies that hold the SIOF grant or the organizations that have responsibilities for leading the programs in the states. These individuals provided names of industry, industrial association, university research, and other partners who were also contacted for information about the SIOF program activities and the value of the program.

Researchers determined that a sample of 15 state programs would provide adequate representation of various DOE regions and industries. Emphasis was placed on those states that received funding for more than one year, recognizing that it takes more than one year to develop the partnerships. Of the state programs included in the evaluation, fourteen have had multiple years of funding, either consecutively or intermittently. Only one new state program was included. This list of states included in this evaluation, which is contained in Table 1, was developed from DOE headquarters and Regional Office staff suggestions and from a review of the SIOF Program website that provides information on past grants. As Table 1 indicates, West Virginia was the first state to receive an SIOF grant and has participated since 1998. Most state SIOF programs are directly managed by state agencies. However, in several states, for example, West Virginia and Iowa, state universities manage the programs. During the course of the project, information was collected from 22 state program staff and 17 program partners, including industry and industrial association staff, staff of associated state agencies, and university researchers.

Table 2 indicates the various industries of the future that compose the foci for the state programs. All nine industries of the future are being addressed by the 15 states that participated in this study. Metals casting, forest products, aluminum and chemicals garnered the most attention. The participating states differed in their coverage of these nine industries; some such as Ohio have adopted a wide-ranging strategy while other states such as Colorado, Maine, and Tennessee have chosen to focus their efforts on fewer industries.

Table 1. Type of SPP Lead Agency and Years of State Partnership Program Grants for States Participating in Study

STATE	Type of Lead Agency	1998	1999	2000	2001	2002
1. Arizona	State[1]					√
2. Colorado	State		√		√	√
3. Idaho	State			√		√
4. Iowa	University			√	√	√
5. Kentucky	State[2]		√	√		
6. Maine[3]	Non-Profit				√	√
7. Massachusetts	University			√	√	√
8. New Hampshire	State			√	√	√
9. Ohio	State		√		√	√
10. Oregon	State		√			√
11. Tennessee	State			√		√
12. Texas	State[4]			√	√	√
13. Washington	University		√	√		√
14. West Virginia	University	√	√	√	√	√
15. Wisconsin	State		√	√	√	√

[1]The state is acting as the coordinator of all activities, but different organizations will lead different industries, e.g., an industry trade association is leading forest products work and a university is leading the agriculture work.

[2]The State is the coordinator of activities, but the leads for different industries, e.g., aluminum and mining, are university based.

[3]Maine received SEP Awards in 1999 and 2000, but they were implemented under a different lead-agency arrangement. Contact was not made with the previous program lead.

[4]Texas IOF is led by the state but housed on the university campus.

Table 2. Industry of the Future Foci for States Participating in the Study

STATE	Metals Casting	Forest Products	Chem.	Glass	Steel	Alum.	Petro.	Mining	Agr.
1. Arizona		√				√		√	√
2. Colorado		√							√
3. Idaho		√						√	√
4. Iowa	√		√						√
5. Kentucky	√					√			
6. Maine	√	√							
7. Massachusetts	√	√	√						
8. New Hampshire	√	√	√						
9. Ohio	√		√	√	√	√	√	√	√
10. Oregon	√	√			√				
11. Tennessee		√				√			
12. Texas		√	√				√		
13. Washington		√				√	√	√	√
14. West Virginia	√	√	√	√	√	√		√	
15. Wisconsin	√		√			√			

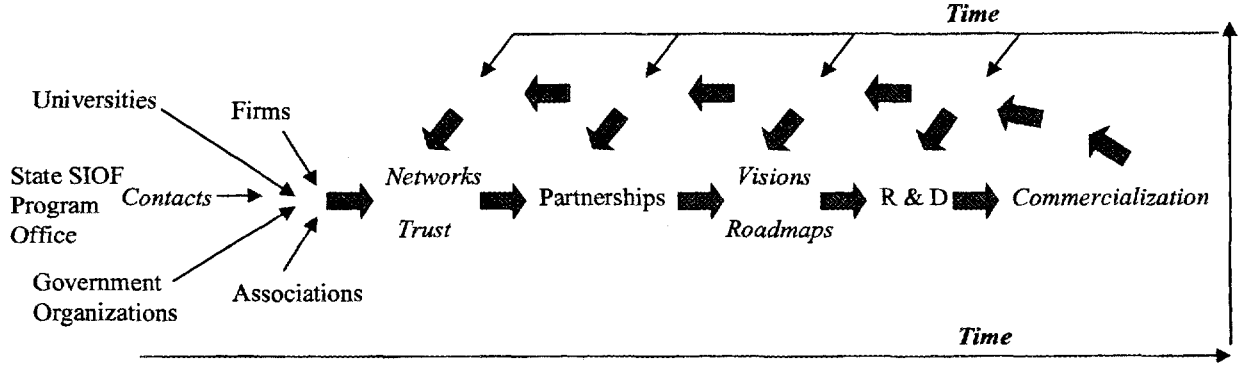
3. RESULTS

This section presents the results of conversations held with state staff and industry participants about the SIOF Program. First discussed is a composite process used by states to develop their programs and partnerships. Summarized next are typical activities undertaken by the state programs, financial resources leveraged to support the programs, perceived benefits of the programs, what the programs accomplish that is not being accomplished by the private sector alone, and constructive criticisms of the program.

Figure 1 presents an illustration of the typical process being followed by the states as they implement their SIOF programs. To begin, the organization responsible for the program, be it a state agency or a university, makes contacts with key stakeholders associated with the various industries of the future targeted by the program. Of course, the key stakeholders in the SIOF are industrial firms. Additionally, state program offices found that tapping into industry associations' established networks proved to be a very efficient way to get large numbers of firms involved in the process. State program offices also contacted university researchers and brought in staff from other government agencies (e.g., state environmental offices, economic development agencies) as appropriate. Once contacts had been made, the state offices, sometimes with significant assistance from these contacts, organized meetings, symposia, workshops, showcases, and other events to bring together stakeholders. At these events, professional networking was encouraged. Through face-to-face meetings and frequent communications from the state offices via newsletters and e-mail, trust is built up among the stakeholders.

Private sector mistrust of the federal government was a big hurdle to overcome. Different states addressed this challenge differently, but most often the programs worked to overcome this mistrust by having as the program lead an individual who had already gained personal credibility with private firms and industrial associations through previous interactions. Programs also used the delivery of U.S. Department of Energy training, tools, and assessments and the interactions involved in their delivery to build credibility for the SIOF program. By being given ready access to these other U.S. DOE products, private sector participants were encouraged that the SIOF program intended to deliver on its promise of assistance to the state's industry.

Figure 1. Generic State Partnership Program Development Process



Once networks have been established, actual partnerships can form, usually within a designated industry of the future. The state program managers act as facilitators in meetings where partners gather to envision the future for their industries and develop roadmaps about how to reach preferred futures. It takes most states a full year or more to work through this stage in the process. Partners include state energy offices and other related state departments, industries, industrial and manufacturing associations,

and university research faculty and center staff. In some states the partnerships involve additional participants deemed necessary for the long-term success of the activity. For example, Iowa involved representatives of the financial sector so that the sector would be familiar with the activities when funding would be needed for capital projects. Colorado's partnership involves a company with considerable experience in distributed generation from renewable resources. Furthermore, many partnerships, e.g., those in Texas, Massachusetts, Ohio, New Hampshire, and Maine, among others, extend their "reach" by working cooperatively through the established networks of industrial associations.

A few states with longer participation in the SIOF Program, such as West Virginia and Kentucky, have moved to the R&D stage, where university researchers actively work on projects identified during the roadmapping exercises. As Figure 1 indicates, even more time is needed for commercialization of research project results. Only a few R&D projects have reached fruition and had their results used by industry at this point in time. In West Virginia and Kentucky, initial and completed projects have focused on near-term issues related to improving manufacturing processes, such as related to the manufacture of aluminum, and the outcome of those processes, such as higher quality aluminum. Thus, R&D has focused on problems currently plaguing the production of products, providing firms with more efficient and reliable manufacturing technologies. On the other hand, the SIOF program has not yet moved to the point where R&D has focused developing wholly new technologies that could be transferred to the private sector and commercialized. In summary, many results of R&D, especially in Kentucky and West Virginia, are currently benefiting the private sector but no SIOF-related R&D was reported to us that resulted in the development of new products or technologies that have been commercialized for sale by the private sector.

Benefits—including exchange of information and delivery of tools that lead to energy savings—accrue to participants at each step, including those that precede R&D. Along the way to R&D and commercialization steps, the state partnerships have used different mechanisms to bring energy-saving opportunities to industry, including workshops, showcases, application of existing research, processes and technologies, and cross-industry fertilization. State partnerships have delivered Best Practices tools and identified Industrial Assessment Center clients. They have educated policy makers, facilitated university-industry information exchange, and developed tools and information services to make it easier for companies, especially smaller companies, to make sound choices about energy and productivity.

Figure 1 indicates that if the partnerships are maintained over a substantial period of time, interactions and relationships between partners will strengthen even further as feedback from experiences with commercialization and R&D activities flows back to continually renew and revitalized the various components of the entire process, for example by expanding networks and improving trust building, leading to the formation of additional partnerships, and providing inputs for new visioning and roadmapping actitivites. The SIOF Program has not been in existence long enough for these iterative processes to have occurred, but it can be expected that substantial benefits would be accrued once this stage is reached.

An important observation about the entire process is that the state programs play a key facilitation role in creating networks, exchanging information, building trust, and sustaining industry's attention to energy savings. For smaller and mid-size firms, the state programs deliver to them information and ideas for energy saving opportunities that they would not have the resources to seek out on their own. The state programs act as a delivery mechanism for a DOE process that focuses an industrial sector's attention on energy and energy-savings opportunities.

Programs actively seek to leverage other financial resources to supplement the DOE grants. A small number of states have been successful at developing program components—either research- or

technical assistance-focused—that are (or have the potential to be) sustained by external funding (see the first state of Oregon example below). Most of these program components are currently focused on single industries, leaving a role (and perhaps need) for the SIOF program to expand them to other industries or to add other components. Where these activities exist, program leaders addressed their ongoing relationship to the SIOF program. One program leader's comments about his states newly established revolving loan fund and its future relationship to the SIOF program are representative of others' comments: "The fund assures that pilot-stage activities will continue in our state, but continued funding from DOE IOF makes sure that the projects that come to the state funding source have the right people involved, for maximum benefit to the whole industrial sector."

State program staff often stated, and we also believe, that if the states lose the DOE SIOF grants, especially after only a few years, all the good work in institution building would be lost in most cases. As explained in more detail below, this is because leveraged funds are not suitable substitutes for the DOE grants that support program operation. Without direction and facilitation, the partnerships would dissolve and all the benefits mentioned below would be lost. Also as indicated below, institution building can be very successful, but the process of institution building is long-term, one that needs nurturing and patience.

Table 3 summarizes activities typically undertaken by state programs. Consistent with the generic process described above, most activities entail bringing stakeholders together for showcases, workshops, symposia, fairs, conferences and meetings dedicated to visioning and roadmapping exercises and networking among firms, researchers, and policy makers. The state programs identify "strategic partnerships" among industry, universities, and, sometimes, technology development and capital providers, and facilitate their efforts to write grant proposals for additional funding. Over half of the participating states have moved to the R&D stage. A good number of states have also actively reached out to their state legislators.

Table 3. Summary of State Partnership Program Activities Undertaken by States in Study

Description of Activity	Minimum Number of States Implementing Activity
Visioning/Roadmapping Meetings	12
Workshops	11
Research and Development/Facilities	8
Outreach to Lawmakers	6
Proposal Writing/White Papers	6
Symposia/Fairs/Conferences	5
Showcases	4
Newsletters/e-mailings	4
Public Meetings/Roadshows	2
Promote Performance Contracting	1

A sampling of some of the more unique state program activities is provided here to demonstrate the variety of activities undertaken by the state programs, including outreach, planning, demonstration

activities, and the establishment of institutions to enable ongoing technical assistance and future research. It is by no means comprehensive list of all the high quality activities being accomplished by the states in our sample.

- Through focus groups about the IOF roadmap, the Oregon state program office learned that industry wanted access to technical staff familiar with Best Practice tools and technologies and consistent behavior from utilities to help them "develop an appetite for efficiency." In the context of electric utility restructuring, a system was developed to allow industries to use the public purpose fees they pay at their own facilities for state-certified energy saving projects. The fees for certification fund energy office staff to engage industry in the IOF roadmap technologies, give BP workshops, and work with industry leadership to develop a corporate culture for energy savings. Only 10 months old, the program has brought $10 million in investment new to industrial energy savings and an annual savings of 11mW of electricity. Wisconsin's Revolving Loan Technology Fund is similarly focused on deploying energy savings technology in Wisconsin Industries. Key to its success—partly defined as having projects that pay interest back to the fund and sustain it long-term—is having someone to act as the "extension" agent and dealmaker for the specific industries of the future.

- A joint activity among neighboring states—Idaho, Washington, and Oregon—placed an energy efficiency (EE) manager at a regional food-processing industry association. Food processing is the "pilot" industry for this activity because its industrial association is more technical-assistance oriented than other industries. The EE manager will bring best practices, workshops, and technical assistance to association members. The services of the EE manager will be fee based, with assessments based on saving achieved, providing a self-sustaining funding mechanism for the activity.

- Using the SIOF grant to pay for workshops and travel, the Kentucky state program built a strong consortium of firms, universities, and DOE laboratories all focused on one industrial sector. The consortium leveraged a large amount of money from the state for equipment, from the state university for a building, and from industry in the state and elsewhere for startup costs. With these resources, the consortia, led by a university professor with deep roots in industry, formed a technology center for this industry. The center now acts as a broker for the research needed by the industry. Industry brings its research needs to the center, the center subcontracts the work competitively to its five partner universities, or if bigger, to its three partner laboratories. The center handles intellectual property rights and takes the "mystique out of research contracting." The center's director notes that it is particularly successful at competing for research grants because the structure of the center insures immediate commercialization of the research product.

- Rather than rely on a small group of industry representatives to develop a roadmap for an industry spread widely across its state, the Iowa program convened a steering committee of representatives from different segments of the industry to draft a "strawman" roadmap for the state based on the national roadmap. A core team from the committee then traveled the state holding eight separate public meetings. Each meeting was hosted by an organization affiliated with the industry and attended by an average of 25 people.

- Partnerships have been involved key players. For example, the Colorado partnership, working on a biomass energy facility, involves representatives of a company specializing in distributed electricity generation from renewable resources.

Table 4 summarizes financial resources leveraged by the state programs. These figures cover all years of the SIOF program, from 1998 till 2002.[3] The figures include both actual 'cash' contributions and in-kind contributions (e.g., staff time, meeting space, equipment). Leveraged resources supported showcases, other types of meetings, research and development, and the day-to-day operation of the state programs. Financial resources were leveraged from eight different sources, including the private sector and the states themselves. In total, at least $67 million dollars of leveraged funds were acquired by the state programs. This is a conservative estimate because there were many other benefits bestowed upon the state programs that we were not able to monetize (e.g., free program advertising to association members). Most importantly, of this total more than $38 million was from non-federal funds. The DOE SEP grants to these states from 1999 through 2001 were $4.83 million. This provides a ratio of $8 to every DOE $1 spent on the state partnership program. That the private sector contributed a significant amount of resources indicates the strong support that the private sector has for the SIOF program. Most of the leveraged resources were devoted to research; a near majority were rooted in partnership with the U.S. Department of Energy and its Industries of the Future research program. Two states were responsible for a good portion of the leveraged R&D funds, West Virginia and Kentucky. One observation about these two programs is that, of all the programs included in this evaluation, these two are led by people well integrated into a university research structure. This might have some bearing on their success at establishing large research programs. All the states were able to leverage their grants to acquire additional funds for meeting-type activities.

Table 4. Summary of Leveraging Benefits: Quantitative ($)

Funding Source/ Activity	Showcases	Meetings, Workshops, Conferences, Symposia	Research and Development	State Partnership Program Office Operations	Totals
Private Sector	263,000	353,100	28,351,127	80,000	29,037,227
States	44,200	36,000	8,012,950	740,925	8,834,075
Universities	102,000	23,000	20,000	275,000	415,000
DOE/Labs	100,000	88,000	28,596,815	96,847	28,866,662
Meeting Fees	15,000	39,500	0	0	54,500
Non-profit	0	15,000	0	0	15,000
U.S. Forest Service	0	189,000	64,240	35,000	288,240
Misc.	14,000	0	0	0	14,000
Totals	538,000	743,600	65,045,132	1,227,772	67,524,704

It needs to be noted that the findings reported in Table 4 do not necessarily suggest that the SIOF program could be maintained by the states without DOE grants. In fact, we would argue the opposite. The vast majority of the funds leveraged by the state programs were for R&D and specific events. These funds were not for program operation and it would probably be inappropriate for state programs to use

[3]Data were collected in 2002, before most 2002 SEP grantees had their 2002 activities fully underway.

these funds for their operations. Only a small fraction of the leverage funding was used to support program operations and this funding represented only about one fifth of the total state programs' operating budgets. From our conversations with the state offices, these funds would not have been provided without the DOE grants in place. Thus, in our view, the DOE grants to the states are irreplaceable; leveraged funds could not be used to substitute for the grants.

All those interviewed were enthusiastic about the SIOF program. Numerous benefits, beyond attracting leverage resources, were mentioned by those contacted. Benefits of the SIOF Program include the following:

- Generally improved communication between government, industry, universities, DOE, national laboratories, and other stakeholders. One industry representative characterized the change in communication among industrial firms, state agencies and universities since the state IOF by saying "Now there is some!"

- Built new professional networks, consortia, and collaborations. The head of a manufacturing extension partnership said, "Our technology/research center and industrial firms in the state have a history of working together on a one-to-one basis. With the state IOF process, everyone—including new partners like the state energy office and the waste reduction center—is working together toward a common goal."

- Improved access to state services by industry;

- Improved access to other government agencies, such as DOE and EPA, by industry;

- Implementation of research and development projects;

- Improved access to information about and help in preparing grant proposals to small businesses;

- Provided valuable Best Practices and other new information to small businesses and industries via workshops and roadshows;

- Provided opportunities for private sector to learn about university capabilities and for universities to learn about private sector research needs. An industry representative noted that "One value [of the partnership] is that I know now what [university researchers] do, the resources they provide. Before, the Universities were a black box."

- Promoted cross-industry and cross-country learning. An industry representative notes that "Cross-fertilization helps [my company]. We have borrowed software technologies from the petro chemical industry and gotten good ideas from the food producers and agricultural folks."

- Improved energy awareness;

- Helped to focus universities on industry priorities and train a new generation of engineers and others focused on energy management. A university lead of at state program described this situation: "The SIOF program provides hands-on-experience for students and gets academics into plants to stay connected to realities of operations and production (and productivity issues)."

- Provided focus to industry's energy conservation efforts and strategic direction for state energy office. A state agency lead said, "Before the SIOF program, we weren't so engaged with industry. We waited for them to come to us and tell us what they wanted. We were opportunistic

rather than strategic. The office was being reactive, not proactive. Through the SIOF program were able to go to them and work together with all players to determine what they need."

- Sustained industry's attention to energy conservation.

At times, the question arises about why government runs programs to benefit industry. The basic question is this: why aren't markets working efficiently or quickly enough to realize energy savings in the industrial sector in the U.S.? Theoretically, it has been known for some time that markets suffer from numerous imperfections and that markets never measure up to ideas set out in economic textbooks. However, it is not always known exactly what barriers plague specific markets with respect to the implementation of energy-efficient technologies and processes. Given the enthusiasm shown for the SIOF program by numerous private sector participants, we decided to ask state program staff and industry representatives what the SIOF Program provides that the market currently does not. In response to this question, we found that the SIOF Program:

- Helps to create a mutually beneficial foundation of cooperation among partners. Markets discourage cooperation. An industry representative noted that "The program assumes and spreads the risk [of developing technology] that no one player—especially the small players—can bear".

- Provides R&D funds for projects that industries and/or small companies cannot afford to undertake by themselves. It was also mentioned that technology developers rarely operate independently anymore, generally due to lack of financial resources;

- Provides technical information to small businesses that do not have the manpower, expertise or resources to acquire the information by themselves;

- Provides technical assistance to small businesses to help them implement new technologies;

- Provides unbiased information to the private sector. It was mentioned that information provided by prospective vendors is often mistrusted and discounted.

- Provides services that do not tie a company to a particular vendor;

- Helps spread the risk of designing, developing, testing, and implementing new technologies that individual companies could not bear on their own;

- Provides information to the private sector that markets may find unprofitable to provide;

- Helps to bridge the gap between the development of new technologies in the laboratory and the commercialization of the technologies. Also helps to increase the market penetration of energy-efficient technologies; and

- Facilitates collaborative, cost-sharing marketing efforts.

Not all comments made about the SIOF Program were positive. Indeed, there are several opportunities for improvement. A very major concern about the SIOF Program expressed by the participants in this project is the uncertainty of continued funding. As intended by DOE and outlined above, the state programs play the role of initiators, facilitators, and networkers. The state programs have created professional networks and collaborations. However, in most cases, these networks and collaborations will fall apart without the keystone support of the state programs. Since it takes years to

build the trust needed to produce the foundation for the networks and collaborations, DOE needs to have patience and to understand that turning the money on and off is not an efficient nor foresighted manner in which to run the State Partnership Program. If the program is turned off, even for a year in some cases, the state program may have to start its efforts from scratch.

Other concerns expressed about the SIOF Program include the following:

- Program needs to go beyond IOF industries to new industries;
- Program also needs to go beyond suppliers to focus on demand-side issues;
- Program needs to give states the flexibility to address energy in the context of concerns of industry such as productivity, environmental management, safety and training, and globalization issues;
- Multi-year funding would be beneficial;
- Few guidelines about how to handle intellectual property rights and disclosure issues involving the private sector and universities;
- State programs need better tools more tailored to their industries;
- DOE program guidance is unclear at times (e.g., should state programs target big companies or entire industries? Where is the program going in the future?); and
- More assistance is needed to help states acquire 'next step' funds.

4. CONCLUSIONS

In conclusion, the SIOF Program as being implemented by the fifteen states contacted by this project is active, vigorous, and successful. State program staff have been extremely energetic in pursuing their goals of building state-level partnerships among stakeholders in the private sector, government and universities. Barriers to trust have been overcome. Private sector participants have acknowledged receiving value from their participation. In a few states, rigorous R&D programs have taken off, where universities are working on new technologies and processes to help firms in their states in the various industries of the future. A substantial amount of funding for R&D has been leveraged by the state programs. Comments made by participants indicate that almost none of these activities would have happened without the SIOF resources. For various reasons, the market was not providing these types of benefits to the program participants.

The success of the SIOF Program is a fragile commodity at this point in time. State programs that might lose their SIOF grants from one year to the next are at risk of disappearing, along with the partnerships they worked hard to form. This is because the DOE grants are irreplaceable; leveraged funds generally cannot be used for program operations and those small amounts of leveraged funds allocated to program operation would not have been provided without the DOE grants in place. Thus, continued funding to maintain institutional relationships is a key to continued SIOF Program success. State program staff also expressed the desire to be able to extend the program beyond designated industries of the future and energy to encompass other industries important in their states and issues related to environmental protection and globalization, respectively.

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