Emerging Technologies: A Case Study of the Super Efficient Dryers Initiative

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ABSTRACT

In an environment of rising energy demands and increased political support, US energy efficiency programs are struggling to set stringent energy efficiency policies that will meet rising performance goals. Meeting these targets will require both widespread implementation of existing energy efficiency measures and the development of new technologies that deliver higher energy savings. The Super Efficient Dryers Initiative (SEDI) – organized by the Vermont Energy Investment Corporation, Grasteu Associates, and Collaborative Labeling and Appliance Standards Program (CLASP) – has developed an approach to introduce new, highly efficient clothes dryer technology into the North American market. This approach has already begun to transform the dryer market and provides a model for other emerging technology initiatives.

SEDI's market transformation approach includes the following components: (1) identifying a compelling savings opportunity; (2) using information in a rigorous way so that sound decision making can occur; (3) ensuring test procedures are sufficient; (4) developing credible performance-based criteria that reflect the market; (5) mobilizing a coalition of energy efficiency supporters in industry; (6) minimizing business risk for the industry while maximizing consumer satisfaction; (7) maintaining nimble and flexible programs; and (8) moving as quickly as possible to keep initiative momentum going. This paper details the SEDI approach, discusses its successes and lessons learned, and recommends ways in which future emerging technology initiatives can be shaped to maximize the potential for success.

Business as Usual for Emerging Technology Development

Emerging technologies have become critical areas of investment for North American energy efficiency programs, as well as for the Department of Energy (DOE) and the Environmental Protection Agency (EPA). These investments are tied to aggressive state and federal policies for reducing the environmental, economic, and societal costs associated with energy use in North American homes and businesses. The market success of an individual emerging technology is not simply dependent on the development of the technology itself, but also upon the level of effective, long-term coordination of the "technology infrastructure" and collaboration of the stakeholders, including federal and international standards, test procedures, voluntary performance specifications (e.g. ENERGY STAR®, CEE), and early market support through lab and field research, demonstration projects, and financial incentives.

Finding the Needle in the Haystack is Great… If You Know How to Sew

The DOE Building Technologies Office (BTO) and EPA ENERGY STAR have developed initiatives to target the early identification of, research into, and deployment of new technologies that offer significant energy savings for commercial and residential buildings. The BTO has supported the advancement of clothes dryers through specific research projects, early research and development of new technologies, as well as consideration of new technologies in updates to federal appliance standards and test procedures. The EPA ENERGY STAR program recently developed the Emerging Technology Award to support new technologies that have offer significant energy savings potential, but have not achieved the product availability or price points to support broad based market adoption.[1]

The fact that both DOE and EPA have provided support for efficient dryers is very helpful. This kind of broad, technology neutral, market focused approach is a welcome change from what has often been a disjointed and technology focused approach to supporting emerging technologies ranging in scale from early demonstration projects supported by small utility programs to large federal or statewide emerging technology programs. In many cases, the mix of individual efficiency programs and government agencies can be perceived as a barrier by manufacturers, who want to "follow an efficient and cost-effective development path, transition products into the market smoothly, and effectively grow markets for their products while continuously improving their products and marketing approaches" (Fedie, 2012).

To this end, regional and national organizations including the California Emerging Technologies Coordinating Council (ETCC), the Bonneville Power Administration's Energy Efficiency Emerging Technology (E3T) initiative, the Northwest Energy Efficiency Alliance, the Northeast Energy Efficiency Partnerships, and the Consortium for Energy Efficiency balance both the deployment of new efficient technologies with the strategic engagement with efficiency programs, key industry stakeholders, and government agencies to support a long term market success.

The full scope of financial investments and breadth of engagement in emerging technologies is highlighted by the California Statewide Emerging Technology Program. CSETP received a 40% increase in budget to $43 million in the 2010-2012 program cycle. However, smaller emerging technology programs are often unable to muster the technical and financial resources necessary for robust evaluations and are simply of insufficient scale to entice an industry partner to bring a new technology to market. It is expensive for the large industrial companies that manufacture mass-market products like residential appliances to research, commercialize, distribute and support a new product line. Therefore introductions of such products are usually national or international in scope, reflecting the need for a broad based collaboration, even among the largest of efficiency programs.

[1] Advanced Clothes Dryers were selected as both the 2013 and 2014 award categories. https://www.energystar.gov/about/awards/awards-archive/2013-emerging-technology-award-advanced-clothes-dryers

The SEDI Approach

Identify a Compelling Savings Opportunity

Clothes dryers are the only ubiquitous major appliance in North American households that has not undergone significant improvements in energy efficiency over the past 20 years (DOE, 1994). Today, the US dryer market is dominated by a single technology (electric resistance, vented models) and dryers account for approximately 6% of household electricity consumption.[2] Clothes dryers are second only to refrigerators as the largest residential appliance electricity end-use in the United States. [3] Recent evaluations of end-use energy consumption in Vermont residential new construction highlights the increasing importance of appliance efficiency in achieving further reductions in total energy use in high performance homes.

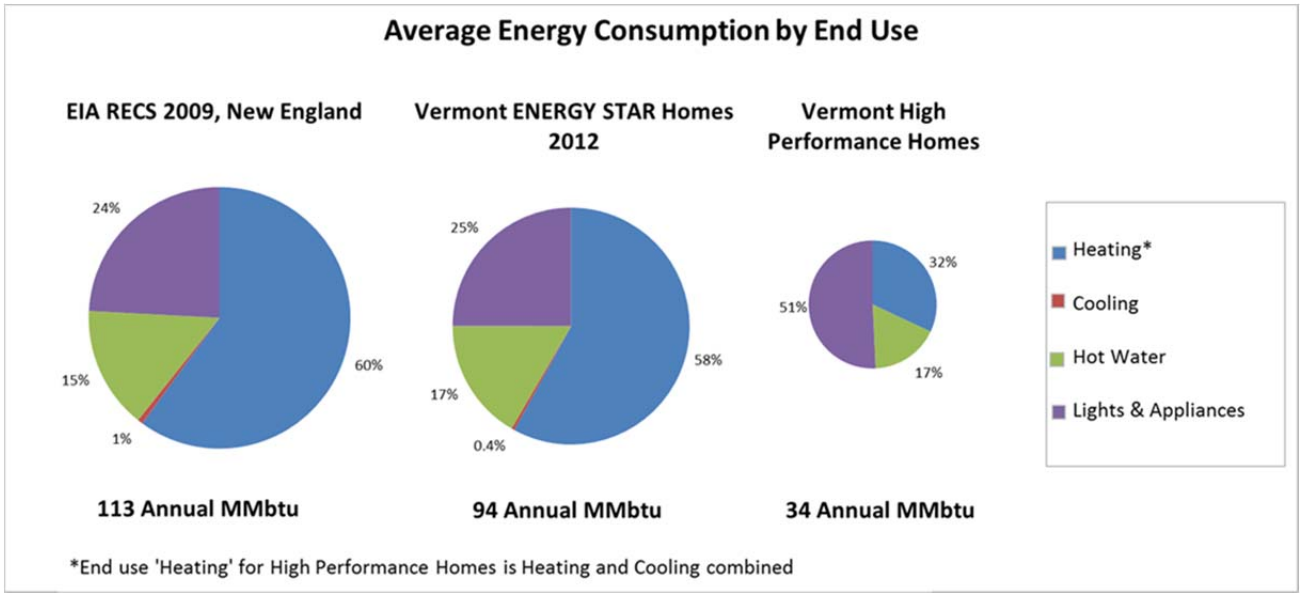

Figure 1. Comparison of regional and Vermont trends in end-use energy consumption in new construction. *Source*: Efficiency Vermont 2014 Better Buildings by Design Conference.

New dryer technologies have moved into other markets (condenser models using heat pumps in Europe) and have demonstrated drastically improved energy efficiency. Furthermore, the European market for heat pump dryers had matured with several manufacturers offering products at varying levels of efficiency. This proven potential for significant energy savings through new highly efficient technology makes the clothes dryer an ideal candidate for an emerging technology initiative in North America.

SEDI first set out to better understand the energy savings potential and the status of the market for efficient clothes dryers. A preliminary investigation by the Natural Resources

[2] Residential Consumption of Electricity by End Use, 2001

[3] Electric water heating consumes more electricity per unit, but has a lower penetration (42% according to RECS 2009 data).

Defense Council (NRDC) indicated that improvements in dryer efficiency were possible through modifications and new technology. Building on this research, CLASP launched a SEDI study that measured the energy savings potential of heat pump dryers in North America. The study conducted laboratory testing that assessed the performance of European heat pump dryers and North American electric resistance dryers under varying test procedures and drying conditions. The study showed that European dryers with heat pump technology were 50 to 60% more energy efficient than typical North American dryers, but also took significantly longer to dry a load of wet laundry.

SEDI further assessed the savings opportunity by engaging major US and international manufacturers of dryers to discuss product efficiency and their plans to introduce new products into the North American market. SEDI learned that several manufacturers were developing more energy efficient dryers, including heat pump dryers, for the North American market. However, all manufacturers had deep concerns about the market's ability to support a clothes dryer with an incremental cost of $300-400 over a conventional electric dryer and about consumer acceptance of longer drying times. Through this process, SEDI identified a compelling opportunity for energy savings, potential partners, and a call to action for efficiency programs to provide coordinated early market support and significant financial incentives.

Use Rigorous Information to Make Decisions

It was clear from the beginning that SEDI and its sponsors needed to engage in rigorous technical research to support the inclusion of energy efficient dryers in incentive programs offered by energy efficiency program providers (EEPPs). Because the product category had received little attention for a long time, research needs includes both information on conventional dryer energy consumption in residential households and the comparative savings opportunity of new, efficient dryer technologies. Both lab and field evaluations of clothes dryers were needed to identify products that could offer significant energy savings, as well as to accurately define the opportunity for energy savings.

Like many residential appliances, measuring dryer energy consumption and estimating the potential for energy savings are highly complex because both are highly dependent upon the design and operation of the dryer and more importantly, the way it's used. It is necessary to understand how the dryer functions, and what choices consumers make both in response to the dryer settings and performance, and in response to other variables including clothes washer performance, composition of the laundry loads, site-specific ambient conditions, etc. This requires laboratory testing, field research, and consumer research.

To prioritize such research and coordinate efforts amongst its sponsors, SEDI launched a technical working group. The working group is composed of EEPPs who are SEDI sponsors, technical experts, and nonprofit organizations. Since inception the working group has produced:

- Research plans prioritizing research activities based on their importance to developing incentive programs;
- A field research protocol to guide clothes dryer field research to be conducted by different organizations in across North America and help them to produce high quality, comparable results;

- A laboratory test methodology that supplements the US DOE clothes dryer test procedure, producing results that more accurately resemble real world drying experience and energy consumption; and,
- Performance criteria for highly efficient dryers that will ensure significant energy savings.

SEDI also promotes the working group as a forum for sharing research. Over the past five years, several organizations have engaged in research activities related to dryers in North America, including NRDC, CLASP, California's investor owned utilities (CA IOU) and Northwest Energy Efficiency Alliance (NEEA) lab and field research. These organizations have shared their findings with the working group and government agencies. Periodically, SEDI composes internal reports summarizing the state of dryer research making the working group a clearinghouse for dryer research and technical knowledge.

SEDI utilizes working group expertise and prior research, also drawing on international experience to provide input to the development processes for test procedures and performance specifications. For example, during the recent amendment of the DOE's minimum standards for dryers, regulators provided opportunities to provide input. SEDI submitted comments on behalf of its sponsors and encouraged sponsors to submit their own comments in coordination. In the past 4 years, SEDI has submitted comments on behalf of its sponsors on the 2015 DOE federal test procedure, the 2015 ENERGY STAR label, and both the 2013 and 2014 ENERGY STAR Emerging Technology Award (ETA) criteria for residential clothes dryers.

In 2014, working group members will initiate several important research activities aimed at collecting data on dryer energy consumption and savings. SEDI is working closely with these sponsors to help coordinate their research activities. Sharing research responsibilities between sponsors ensures that important research tasks are completed efficiently without duplicating efforts. Below is a brief list of the research activities planned for 2014:

- Developing a baseline of the energy consumption of conventional dryers both in the laboratory and in the field;
- Assessing the performance of dryers employing new technologies in the laboratory and the field; and
- Gathering data on consumer usage patterns.

Ensure Test Procedures are Sufficient

For any emerging technology initiative, it is important that the test procedure used to determine energy consumption can both differentiate products and reflect real world energy use. For residential clothes dryers, the federal test procedure is used to measure energy consumption. It was revised in 1997 but was obsolete for the clothes dryers currently on the market.

The vintage DOE test procedure required the manual termination of the test cycle once the dryer had achieved a remaining moisture content (RMC) of the test load of less than 5%. However, as verified by the DOE, NRDC, and SEDI sponsors in laboratory testing, even though modern North American clothes dryers are relatively inefficient compared to the best European models, the energy efficiency of our dryers varies widely, often due to differences in automatic cycle termination. Although older designs continue to use simple timers, a majority of today's

dryers are built with sensors intended to automatically terminate the drying cycle when the laundry is dry. Some of these sensors are better at determining dryness than others, and the dryers with the better sensors minimize the amount of energy used. Improving automatic termination sensors is a major opportunity for clothes dryer energy savings; automatic termination can improve efficiency by 10-15%.[4]

In January 2013, DOE initiated a rulemaking to revise the federal test procedure. SEDI utilized the expertise and prior research of SEDI's Technical Working Group members to compose and submit technical comments to DOE advocating for the use of automatic termination during the drying process. SEDI and its sponsors coordinated efforts with US energy efficiency advocates who were also advocating for automatic termination. In the end, DOE revised the federal test procedure to give manufacturers starting in 2015 the *choice* of testing their dryers with either the prior approach that required manual interruption of the dryer cycle, described in Appendix D1, or a new protocol that allowed automatic termination described in Appendix D2.

Despite the 2013 revisions to the DOE test procedure, including the optional Appendix D2, the results of the current test procedure do not provide an accurate estimate of a clothes dryer's real world energy consumption. SEDI-associated lab and field research demonstrates that dryers consume significantly more energy in the real world than the federal test procedure predicts. One obvious problem is that the 2013 test procedure revisions did not include changes to the standardized reference laundry test load specified. The DOE test load is still composed of identical thin cotton sheets which are much easier to dry than the more complex items and textiles typically put into clothes dryers. The test procedure also only measures energy consumption for a particular dryer setting, the dryer's default or "normal" mode with the highest heat setting, while in actual use several different modes may be used.

Continuing to work towards additional revisions to the DOE test procedure that will more accurately estimate real world dryer energy consumption—and differentiate the performance of new efficient technologies—is an important focus for SEDI. Getting to a better test procedure will require more laboratory, field and consumer research. SEDI's technical working group provides a forum for members to collaborate on efforts that will lead to improvements in the measurement of clothes dryer energy consumption. SEDI also coordinates these efforts with energy efficiency advocates who participate in DOE's process for the next revisions to the test procedure. Modifying the federal test procedure will be a long and complex process. By preparing now, SEDI can help make the research and expertise available that will be needed to make the necessary improvements to the federal test procedure in the coming years.

Develop Credible Performance Criteria that Reflect the Market

To do their part helping to build markets for new, energy efficient clothes dryers EEPPs must be able to identify dryers that deliver consumers energy savings and performance. Performance criteria should reflect a broad technical consensus, be based on regulatory precedent, and be open and transparent. Based on prior research and engagement with industry,

[4] The ENERGY STAR Scoping Report for clothes dryers identified opportunities for efficiency in dryers, including higher energy savings are a result of moisture sensing over simple temperature sensing.

SEDI proposed performance criteria for energy efficient clothes dryers with two tiers. The first tier is intended to cover dryers that achieve moderate improvements in energy efficiency, probably through modifications to existing technologies. The second tier identifies products that employ new technologies, like heat pumps to achieve larger efficiency improvements.

The Environmental Protection Agency's (EPA) ENERGY STAR program supports this two tier approach. As noted above, EPA has the ENERGY STAR Emerging Technology Award for clothes dryers currently in the field, and will be introducing the ENERGY STAR for clothes dryers labeling program in 2015. SEDI is working with EPA with the goal that the two programs will provide an appropriate mechanism for the recognition of energy efficient dryers useful to all stakeholders.

ENERGY STAR label for dryers. In August 2012, EPA initiated the development of an ENERGY STAR label for dryers. EPA made the decision to develop the label based on prior research demonstrating improvements in dryer efficiency, including research conducted by SEDI and their sponsors. Industry also played a role; EPA engaged manufacturers, which SEDI helped to facilitate, confirming that greater dryer efficiency was possible.

A key component of the ENERGY STAR specification proposal has been use of the DOE D2 test procedure. ENERGY STAR chose this procedure to ensure differentiation of different automatic termination approaches, which is only possible through a test procedure that allows for the full cycle testing of the dryer's performance.

Several manufacturers have reacted negatively to both the proposed energy efficiency level set for ENERGY STAR qualification and the requirement to use the D2 test procedure. SEDI's sponsors represent some of the most progressive energy efficiency program providers in North America; as a result, SEDI is a strong voice for greater energy savings and provides a counterweight to industry. Based on working group member expertise and prior research, SEDI's submitted comments to EPA supporting both the Appendix D2 requirement and the proposed efficiency level. EPA released the final ENERGY STAR specification for clothes dryers on May 19, 2014 and an effective date for January 1, 2015.

ENERGY STAR emerging technology award for dryers. Early SEDI research comparing the energy efficiency of European heat pump dryers to North American electric resistant dryers had a significant influence on EPA's decision to select dryers as the next target for an ENERGY STAR Emerging Technology Award. SEDI's study verified that dryer efficiency could be significantly improved through the market introduction of new technology. The ETA specification recognized dryers that were 26% more efficient than typical US models. In June of 2013, Samsung was announced as the recipient of the ETA for their model DV457 dryer.

The expectation was that the energy efficiency performance target was sufficiently high that manufacturers would introduce new technologies to meet it. However, the Samsung DV457 met the efficiency improvement requirement through advanced controls, heat modulation, and other adjustments to conventional dryer technology. In its most efficient mode, lab and field testing has shown that the DV457 can save 34% compared to a typical dryer. Consumer acceptance of the DV 457's longer drying cycle times remains an area of concern and focus for future evaluations of new products. SEDI worked with its sponsors to incorporate the DV457 into residential incentive programs, and broadly promote this first ETA winning product.

Based on the success of the 2013 ENERGY STAR ETA for clothes washers, EPA issued the 2014 ENERGY STAR ETA in May of 2014. The revised award includes a higher efficiency target and references Appendix D2 of the revised DOE test procedure. As of the writing of this report, no manufacturer has formally submitted a product to EPA for consideration, and no manufacturer has yet introduced a clothes dryer capable of achieving this new threshold of performance into the North American market. SEDI has identified several US and international manufacturers that are working to develop heat pump dryers for the North American market and more than one is close to market introduction. Of course our experience also shows that it is ill-advised to attempt to predict which technical solutions industry innovation will bring to market. SEDI will continue to engage with manufacturers and work with sponsors to build markets for the new dryers when they arrive.

Build a Coalition

Bringing a coalition together to support emerging technologies is important for several reasons. First, it provides a scale of program support that provides manufacturers the confidence to move forward quickly. Second, it keeps energy efficiency programs aligned on a common approach and plan for influencing the market.

As of this writing SEDI consists of 15 individual EEPPs and two regional organizations (the Northeast Energy Efficiency Partnerships and the Northwest Energy Efficiency Alliance). These sponsors represent over 64 million residential electric and gas customers and $3.2 billion in energy efficiency budgets, of which $600 million is available for residential programs. SEDI sponsors represent approximately one third of the $9.4 billion 2012 combined budget for energy efficiency programs in North American. This scale provides manufacturers of new products using emerging technologies with the confidence that there will be meaningful support when they come to market.

Minimize Business Risk and Maximize Consumer Satisfaction

Targeting emerging technologies involves risk for manufacturers, for EEPPs and for government regulators. The ENERGY STAR labeling program is structured to recognize the most efficient 15% of products on the market in a targeted category. EEPPs typically want there to be several models of an efficient product, with the ENERGY STAR label, offered by different manufacturers before they offer incentives to promote them. Manufacturers want to be confident that before they invest in developing a new, energy efficient product that it will receive both the ENERGY STAR label and EEPP incentives. It is impossible to simultaneously satisfy all three critical stakeholders. No one party is generally willing to assume all of the risk associated with taking an aggressive position because each party is dependent upon the others.

SEDI has conducted a continuous iterative process of building confidence with all stakeholders to make sure that all are aware of the strong commitment to the successful market introduction of new products. Early on the SEDI team discovered the virtues of what we have come to call “chicken and egging.” This involves breaking down each stakeholder’s path to active support of energy efficient clothes dryers into smaller, less daunting steps. Once SEDI succeeds in convincing one stakeholder to take a small step, we immediately turn and tell the other parties about it, urging them to do the same. In this way a big bet on a new technology can

be turned into a series of less risky decisions, each of which is supported by a reciprocal step by other stakeholders. EPA deserves credit for taking the all-important first step by advancing parallel efforts to develop an ENERGY STAR label for efficient gas and electric dryers, while also targeting the most promising technologies with the ENERGY STAR ETA.

Maintain Nimbleness and Flexibility

Work in emerging technologies is inherently unpredictable. SEDI recognized this by developing a flexible work plan and focusing on desired end outcomes rather than over-specifying actions that we would take to get there.

Keep Momentum Going

Regular communications with SEDI sponsors and other key stakeholders has been important to our work. This includes proactively reaching out to manufacturers on a regular basis to understand their status and plans and communicating that out to energy efficiency programs so they can plan effectively. An emerging technology program has to be ready not only to facilitate communication between industry, government and EEPP stakeholders, but also between stakeholders in the same categories, and even within single organizations. For example, several times SEDI has helped manufacturer marketing staff make the case for new product development to manufacturing engineers or to upper management.

Planning for the next step also builds confidence. Although the European clothes dryer market has several critical differences from the North American, one of the lessons that seems to be equally important in both contexts is the need not only to define energy efficiency performance for tomorrow, but also to set a performance target for several years out. Short term targets are for engineers and marketers to work with when designing the launch of specific product models. Longer-term targets need not be so defined and can be modified if need be, but let all parties know where the industry, and the stakeholders that support it, are heading.

Successes

The success of an emerging technology program can be measured in several ways. The ultimate goal is significant market penetration of a new energy efficient technology that did not exist before the program. However, it may take many years to motivate industry partners to commercialize a new technology in the form of a consumer product, and then for that consumer product to succeed in the marketplace. There are several steps along that way that can also serve as useful mileposts to measure the progress of the program.

Redefining the Possible

SEDI was first conceived in 2009, when the conventional wisdom in the North American energy efficiency community was still the only energy efficient alternative to the conventional, vented tumble dryer was a clothes line. There was no ENERGY STAR program for clothes dryers and the DOE minimum efficiency standard had last been updated in 1994. SEDI's first success was to engage with and successfully change government, energy efficiency program

provider (EEPP), and industry stakeholder perspectives on the viability of a new, more expensive, but more efficient product category of residential clothes dryers.

Broadening Types of Performance Criteria

Clothes dryer users have always expected their clothes dryers to dry wet clothing, but other performance criteria had not been defined. Through its early research into European heat pump condensing clothes dryers, SEDI showed that energy efficiency, length of cycle, and vented or unvented could also be performance metrics. The residential clothes dryer product category until now had really only offered consumers choice on price and fuel (electricity or natural gas) as clearly defined, comparable characteristics. Part of the emerging technology process has been expanding the range of choices to include other relevant performance criteria, and standardizing the measurement and reporting of them.

Focusing on Policy and Regulatory Changes

Energy efficiency regulation for consumer products in the US is usually developed through a collaborative process with input from industry, energy efficiency advocates, and possibly other parties. Clothes dryers provide an unusually clear example that industry alone cannot be depended upon to drive energy efficiency improvements. Because the advocacy community saw no efficiency improvement potential in clothes dryers, and left the category alone for many years, the technical evolution of clothes dryers exhibited none of the efficiency improvements shown by other residential appliances. With no impetus from industry or the EEPPs, DOE did not revisit the clothes dryer test procedure for almost 20 years. Because the test procedure became effectively obsolete during this time, it did not show that significant differentiation in actual energy efficiency performance had developed across the spectrum of available products. As discussed above, the 2013 revisions to the DOE test procedure leaves it far from perfect, but SEDI made significant contributions to improvements that will now allow the emerging technology promotion process to progress.

Another SEDI success was EPA's decision to offer its second ENERGY STAR Emerging Technology Award for advanced clothes dryers, before any substantially more efficient clothes dryers were actually available on the US market. EPA based its decision on a variety of factors, but SEDI's advocacy and research played an important role. EPA's action in turn significantly raised the profile of energy efficient clothes dryers and put energy efficiency programs and the industry on notice that ENERGY STAR would be active in this area.

Advancing Technology Innovation

Oddly enough for an emerging technology initiative, one area where SEDI does not focus is on the development of new energy efficient clothes dryer technologies. Instead, SEDI is focused on expanding the deployment of an existing technology into a new marketplace. In fact, SEDI was not specifically designed to spur technical innovation because developments in the European market had already demonstrated the viability of at least one new clothes drying technology. The single new ENERGY STAR Emerging Technology Award winner employs improved, but conventional, North American clothes dryer technology. SEDI maintains running

dialogs with researchers exploring entirely new technology approaches, but also maintains a technically neutral stance while focusing on setting performance targets.

Lessons Learned

Build on Past Success

ENERGY STAR and EEPP incentives have become a potent force in the North American residential appliance market. The Super Efficient Refrigerator Program (SERP), started in the late 1980s, gathered pledges of incentive dollars from energy efficiency programs to create a large financial prize to spur manufacturers to develop more efficient products. The incentive was sufficient to focus manufacturers to develop new efficient refrigerators, and to bring them to market. SEDI has shown that today it is not necessary to go through the arduous legal and administrative process of gathering incentives pledges and creating a formal competitive structure. Probably because of SERP, and also as a result of years of energy efficiency program incentives successfully growing markets for ENERGY STAR qualified appliances, the promise of access to the ENERGY STAR label and significant retail incentives are now sufficient to motivate manufacturers to invest in research and development of new technologies.

A global perspective also allows for the identification of shared ET challenges at the regional and national level, and the facilitation of discussion towards solutions. An integrated perspective for an ET program can reduce duplication of efforts, enable rigorous and streamlined vetting of technologies, and promote valuable knowledge sharing between utilities, governments, and other ET stakeholders on successes elsewhere. To date, SEDI is one of the few initiatives that integrated international best practices into its program design and market approach.

Choose Your Timing Carefully

Realistically, there is little that emerging technology programs can do to change the underlying dynamics faced by industry, EEPPs, and regulators. Assuming that these dynamics are sufficiently aligned, timing becomes important. For example, a large, unexploited savings opportunity that can be obtained with a high degree of certainty at a reasonable cost will naturally tend to receive a significant portion of a program's budget (CFLs being the obvious example). SEDI emerged at a time when EEPP program managers are broadening their portfolios because they would not be able to continue meeting their savings goals and spending their program budgets simply by moving very large volumes of CFLs. Had SEDI started five years earlier, it might not have progressed as quickly because there was not a strong interest in finding new technologies to substitute for CFLs in EEPP portfolios. SEDI also launched at about the same time that Asian washer and dryer manufacturers started to have a significant presence in major US retailers, creating pressure on manufacturers to fight for market share by introducing new products. SEDI has also ridden the success of the European Top Ten initiative and the European Energy Label in building a European market for efficient clothes dryers. That success, even though in substantially different market, has helped reduce the perception of risk of pursuing emerging clothes dryer technology in North America.

Applying the SEDI Approach to Other Emerging Technologies

SEDI sponsors and EPA anticipate a successful market introduction of high efficiency clothes dryers in 2014 and 2015. At that time, the role of the initiative is anticipated to change as the broader efficiency community develops broad based support for high efficiency laundry products. The focus for SEDI and advocates will likely shift back to improvements in the DOE test procedure and alignment with international standards to better reflect continued advancements in technology and changes in consumer behavior associated with laundry.

The collaborative relationships formed between efficiency programs, EPA, DOE, energy advocates, and manufacturers serve as a foundation for the advancement of other emerging technologies and opportunities. The leadership and support for technical and market based forums will be critical for developing the key elements of a coordinated market introduction of new products and technologies. With the aggressive efficiency and climate goals being set at the state, federal, and international level will require the coordinated efforts of all stakeholders in creating a vibrant market for emerging energy efficient technologies.

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