



Findings of the Climate Technology Initiative Conference

Seventy-four experts from federal, state, and non-governmental organizations (NGOs) attended the conference held October 10th and 11th 2007 on the proposed EPA Climate Technology Initiative (<http://www.epa.gov/cleanenergy/climatetechnology.htm>). Twenty experts from eighteen organizations made presentations on topics relevant to promoting emerging climate protection technology (ECPT), including: climate science; emerging technologies for climate protection; green marketing; product branding; individual, corporate, and government consumers; state activities to promote emerging technologies; and technologies that could qualify for EPA recognition. Conference participants asked questions, elaborated points with examples from their experience, and offered advice. Summaries of key findings were presented to participants at the end of the first and second days. This written summary of findings was circulated to all participants via e-mail and approved by consensus.

Finding 1: Concern for Climate Change Has Created a Market for New Technology

There is increasing scientific consensus that greenhouse gas emissions are affecting climate in ways that threaten environmental security and prosperity. Early action with no-cost, low-cost, and carbon cost-effective technical solutions will result in long term savings by avoiding the risk of drastic measures later. The growing “green” and “carbon-conscious” consumer markets are making energy efficient technology highly profitable, which is attracting substantial investment in research, development, and technology commercialization.

Customers for emerging climate protection technology to protect the climate are highly motivated, educated and influential and are willing and able to pay higher prices for environmentally superior products and services. Companies are

increasingly offering technology-based solutions, but often face daunting challenges in validating product performance, reliability and durability and in overcoming regulatory and other market barriers.

In commercial and industrial markets, green and energy saving initiatives provide a new motivation and opportunities for businesses to search for internal efficiencies. Environmentally sound technologies can become major cost-savers and help companies achieve the climate performance increasingly demanded by investors, customers, and the public.

Finding 2: EPA Can Speed Commercialization of Environmentally Superior Technology

Existing EPA programs have provided a wealth of experience on how government partnerships can speed the introduction of desirable new technology. Partnerships can develop test methods, organize third party testing, promote technical results, and inform consumers of how the savings from increased energy efficiency can pay back any increase in product purchase price. These efforts will reduce the perceived risk of new technology, guide suppliers to improve performance and reliability, and will reward investors and companies that offer environmentally superior technology. EPA can help environmentally superior technologies gain a larger early market to satisfy federal procurement requirements for reduced energy intensity (e.g. Executive Order 13423) and in military and other governmental applications where remote operation makes energy efficiency more economic. In some, but not all cases—product recognition such as the ENERGY STAR label can be helpful in guiding consumers to the most affordable life-cycle choices. The Climate Technology Initiative can select sectors and technologies that are a ‘fit’ with EPA’s competencies and capabilities.



EPA can play a significant role in documenting the payback periods or cost-effectiveness of emerging technology in reducing carbon emissions. EPA should be the verifier of an emerging climate protection technology's economic feasibility and environmental benefits.

Finding 3: Understand the Market and the Technology

Each segment of the consumer market is willing to accept a different level of cost and risk, and therefore, marketing strategies should be tailored to each segment. In the technology diffusion cycle, the market can be broken down into the early adopter, early majority, late majority, and the late adopters. Early adopters that are first to invest in emerging technologies are willing to accept higher risks and costs than their early majority and late majority counterparts. The market majority is more risk-averse and prefers to invest in technologies only when they provide reliable performance and once the costs have come down and stabilized.

In some cases, increasingly high electric rates, utility incentives and stringent equipment performance standards create the ideal markets for emerging technology. For example, California standards for water pumping equipment under Title 20 and utility rebate programs make pumps cost-effective with up to 70% electricity savings. Increasing sales in the California "earlier adopter" market are already bringing manufacturing costs down. Lower costs, proven performance, and EPA recognition might support rapid introduction in other markets that are in an earlier stage of the adopter cycle, ripe for a transition.

Climate protection technology will often be most successful when applied in particular application, climate or market situations and some may require regular maintenance. In some cases market success will depend on providing proof and

incentives for co-benefits such as clean air, local employment, and community involvement.

Sophisticated new product labels would be required that can present the product performance data and could translate that data into relative scores for energy savings, greenhouse gas reduction, product design maturity, reliability, and cost-effectiveness (per unit of carbon reduced). Performance data presented absolutely and relatively would allow conscientious buyers to make their own informed decisions.

Finding 4: Vigorously Protect the ENERGY STAR Brand

ENERGY STAR is a brand with high consumer recognition and trust that targets the mass market. It distinguishes products that have high energy efficiency, low operating costs, reliable energy savings, and high performance. The ENERGY STAR program is very effective in promoting energy efficiency which lowers customers' utility bills and reduces greenhouse gas emissions. Seventy-five percent of ENERGY STAR products are no more costly than products that use more energy to operate. In the cases where ENERGY STAR products do have higher purchase and/or installation costs, these costs are quickly recovered in energy savings. Therefore, actions that promote emerging climate protection technology must be carefully crafted to absolutely not endanger the ENERGY STAR program success.

Finding 5: Develop Unique Recognition Programs for Emerging Climate Protection Technology

Much emerging technology offering substantial greenhouse gas reductions are either components in larger integrated systems or will be purchased by home and business owners but installed by contractors. In these market circumstances, EPA can develop a separate and more comprehensive recognition program that will address the needs of



more sophisticated and detail-oriented buyers who will want to know how much energy is being saved, how much GHG emissions are reduced, and how reliable the new product is including ease of repair and expected useful life.

ENERGY STAR products often must be quickly purchased to replace failed appliance, while many emerging climate protection products can be more carefully researched and there is more flexibility in choosing the time and place for installation.

Unlike ENERGY STAR technologies, emerging technologies are often more expensive to consumers because companies must recover research and product development costs, because production is below economies of scale, and because marketing and warranty costs are higher. EPA can help these technologies and protect the ENERGY STAR brand reputation by developing unique programs to promote emerging climate protection technology to customers willing to pay more to make the maximum reduction in greenhouse gas emissions. EPA should focus efforts on substantiating economic benefits, widely conceived.

Finding 6: Emerging Climate Protection Technology Can Be Promoted At Every Stage of Development

Products go through a predictable development cycle from first concept, to development of prototypes, to beta testing, to full commercialization and market penetration. “Emerging products” are defined as products with verifiable performance that are commercially available but account for less than about 2% of market share, and are at least regionally available. The environmental marketing challenges for emerging products are to perfect test and product standards, to benchmark competing products, to measure life-cycle environmental performance, and to certify that performance to the satisfaction of product rating agencies, environmental

advocacy organizations, and consumers. Companies offering emerging environmental technology can jump-start and accelerate market penetration by partnering widely with organizations that have technical skills and public confidence. EPA can orchestrate that cooperation in partnerships with other federal and state agencies, with energy utilities and their associations, and with other NGOs. This would be complemented by the work of established clean technology investment forums, which link venture capitalists with product companies and by the work of other existing forums which finance commercialization and marketing and match potential suppliers and buyers. EPA can also work through its networks to globalize markets for products proven to perform in US markets. In some cases, EPA may wish to promote long-established technology with unappreciated value in reducing GHG emissions that has the same challenges of newly emerging technology in gaining customer acceptance and capturing larger market shares.

Finding 7: EPA Will Want To Concentrate on Technologies Within Its Core Competencies

A new program is most likely to succeed when the necessary activities are already within that organization’s core competencies. The EPA Climate Protection Partnerships Division core competencies include:

- Respected & credible environmental authority
- Businesslike green marketing/communicating
- ENERGY STAR reputation
- Master of partnerships and teams
- Environmental evaluation tools and services
- Responsible for current and future regulations



- Capable in removing regulatory barriers
- Influential in government permitting & procurement

Other EPA offices, such as the Office of Solid Waste and Emergency Response (OSWER) and the Office of Water (OW) have established competencies in topics with implications for climate protection technologies.

Finding 8: EPA Needs Partners to Complement & Supplement Its Core Competencies

A partnership to successfully introduce new technology needs a wide range of competencies and assets. The product company itself may need venture capital, equity partners, loan guarantee services, and other support. The EPA Climate Technology Initiative may need partners that have unique technical, marketing, communicating skills and other skills. These partners will typically include other federal and state agencies, standards and testing organizations, energy utilities and their associations, environmental and consumer NGOs, professional and trade associations, and other intermediary organizations.

Finding 9: A Portfolio Approach Can Support Multiple Products at Different Stages

EPA can start with a small set of products during its pilot stage and add more products as initial success is achieved. The products can become a portfolio with successful technologies graduated and new technologies inducted to maintain a balance of activities. Networks of experts from partnering organizations can identify promising

technology that would benefit from EPA's program competencies; EPA can develop and refine a process for screening suitable technologies; screen and accept suitable technologies with willing companies, adding additional partners to a technology team as appropriate; and develop a workplan based on an analysis of key barriers to include technology validation, technology improvement, performance recognition, etc.

Finding 10: "Pilot" Projects Must Be Strategically Selected and Agilely Pursued

Technologies for a pilot program should be carefully selected, favoring technology with high greenhouse gas savings potential in significant markets and concentrating on technologies where EPA has core competencies. Work should be organized to avoid duplication of effort by other organizations and to speed each step toward market success. The pilot phase might favor climate protection technology not requiring expert installation and maintenance unless those services are already in place or part of the strategy. Certified emerging technologies need to have demonstrated supply channels and skilled technicians in the field.

EPA will insist on the highest standards of excellence in environmental performance validation and rely on a panel of collaborative experts for advice. Technologies demonstrating superior environmental performance with acceptable environmental tradeoffs should be brought to the attention of early-adopter consumers, corporate green markets, and government procurement offices where Executive Order 13423 and other mandates will promote technologies that save energy and reduce GHG emissions. Web-based and other modern tools should be employed.



Criteria can include:

- Commercially available, but not widely adopted (<2 to 5% market share)
- Preferably offered by more than one supplier, but not required to be
- Demonstrated environmental performance; third party verified to agreed standards
- Likely to significantly reduce greenhouse gases at competitive costs
- Capable partners, adequately financed, and established business record
- Challenges matched to EPA competencies and appropriate roles

Finding 11: EPA Can to Help Define New Product Carbon Performance Standards

EPA can help define and tailor life-cycle climate performance (LCCP) for emerging climate protection technology in ways that are accurate and trusted, but also not be prohibitively expensive for start-up companies. These practical tools should use standard assumptions and generally accepted climate and other data sets to simplify calculation while providing full transparency. Once standards and tools are agreed, EPA can support the market for green technologies by promoting the proven methodology.