

# Energy Matters

U.S. Department of Energy, Industrial Technologies Program



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## Save Energy Now LEADER Kicks Off with 32 Signatures

On December 2, 2009, the U.S. Department of Energy's (DOE's) Industrial Technologies Program (ITP) held a signing ceremony at the U.S. Capitol Building for the first 32 companies to publicly commit to the *Save Energy Now* LEADER initiative and voluntarily Pledge to reduce their industrial energy intensity by 25 percent over the next 10 years. These companies joined DOE in a partnership that will provide them with technical assistance and resources to make significant improvements in industrial energy efficiency and lead America toward a more secure and sustainable clean-energy future. Following in their footsteps, another dozen companies have come on board since the event, totaling 44 LEADER Companies as of publication.

Assistant Secretary of Energy Efficiency and Renewable Energy Cathy Zoi was the featured speaker and commended these companies on their commitment. She highlighted that the U.S. industrial sector accounts for more than 18 million workers, as well as 30 percent of the energy used nationwide and 27 percent of the country's carbon emissions. The 32 *Save Energy Now* LEADER Companies who signed the Pledge represent 1.2 million of these workers—emphasizing the significance of these companies' commitments to energy efficiency by not only generating energy and carbon savings, but also by serving as an inspirational example of how the country can tackle some of its most challenging energy and environmental issues while increasing our economy's competitiveness.

After the signing ceremony, a reception was hosted by the Alliance to Save Energy, Dow, PPG, and Schneider Electric. All of the companies in attendance expressed their enthusiasm in being among the first forward-thinking energy champions, as well as their willingness to each be a LEADER in every sense of the word. Companies specializing in information technology, pharmaceuticals, and paper and materials were among those signing the *Save Energy Now* LEADER Pledge. AT&T's newly appointed director of energy, John Schinter, said the company will target data centers—the large rooms of computers that hum with fans trying to keep them cool. He also stated the company would use its own technology to add “smart meters” to its buildings, allowing it to measure usage.

The *Save Energy Now* LEADER Pledge is part of DOE's larger effort to boost efficiency in the industrial sector and serve as a vehicle to reinforce energy efficiency as a profitable business model. The LEADER program is a new component of the existing *Save Energy Now* initiative through which companies partner with DOE to identify opportunities for energy savings in the companies' operations by conducting energy audits and assessments. Participating businesses also have access to tools and training to implement recommendations designed to help reduce their energy use and operating costs. Over 2,000 plants received energy assessments between 2006 and 2009 through the *Save Energy Now* program; these assessments have identified \$1.3 billion in cost-saving opportunities, 119 trillion British



### Save Energy Now ALLY

ITP's *Save Energy Now* initiative to drive a 25-percent reduction in industrial energy intensity in 10 years continues to gain momentum in helping manufacturers of all sizes boost their energy efficiency, no matter where they fall on the energy performance continuum. Realizing partnerships with stakeholders are key to achieving the 25 in 10 goal, DOE has implemented the *Save Energy Now* ALLY program to help industrial companies and *Save Energy Now* LEADER Companies leverage their efforts and gain access to the resources they need for success in attaining their energy- and CO<sub>2</sub>-emission-reduction goals.

*Save Energy Now* ALLY is a push to build a national network of partners to help LEADER Companies and other manufacturers improve industrial energy efficiency by delivering resources to help meet their ambitious energy goals. LEADER Companies prepare an energy-use baseline and energy-management plan and report their progress annually to ITP. An ALLY may target its resources to help these LEADER Companies meet their Pledge. DOE is seeking collaborations with partners that have existing relationships with U.S. manufacturers and the capability to deliver industrial energy efficiency resources. By joining together, DOE and ALLY Organizations are creating a national network of federal, local, and specialized industrial energy efficiency services.

There are unlimited opportunities to help industrial companies achieve their energy efficiency and energy-management goals. Organizations may offer direct, indirect, or in-kind resources and assistance to help companies. For example, some partners may choose to introduce companies to DOE's resources, provide technical assistance, develop new energy efficiency resources, offer financial incentives for energy-saving projects, or help fund research and development activities for emerging or new technologies. Other partners may bring problem-solving skills to help industry move forward with energy-saving projects or strategies. DOE welcomes innovative approaches and encourages utility, state, industrial assessment centers and trade associations to sign the letter of commitment and gain national recognition for participating in industrial energy efficiency achievement.

For more information, please visit

[http://www1.eere.energy.gov/industry/saveenergynow/leader\\_ally.html](http://www1.eere.energy.gov/industry/saveenergynow/leader_ally.html).



*John Woodworth, Senior Vice President of Corporate Supply Chain Operations at 3M, is congratulated by Assistant Secretary Cathy Zoi and Jeffrey Walker (ITP's Partnership Development and Deployment Supervisor) after being the first to sign the Pledge at the event.*

thermal units of natural gas savings, and 11.2 million metric tons of carbon dioxide (CO<sub>2</sub>) savings. The 32 LEADER Companies signing the Pledge at the event displayed their commitment to the 25-percent energy-intensity reduction goal and raised the bar for all industrial facilities while benefitting from their own bottom line.

By committing to the program, *Save Energy Now* LEADER Companies receive help in overcoming some of the biggest hurdles their businesses face when it comes to driving energy efficiency—a shortage of time, resources, and in-house expertise. *Save Energy Now* LEADER Companies receive priority access to tailored technical and financial resources, along with energy-management expertise. ITP's energy assessments and technical assistance activities are provided by experienced integrated contractors from national laboratories, industry associations,

academia, and the private sector. Specific services provided by these industrial efficiency experts range from efficiency baselining to project implementation, industry benchmark comparisons, access to third-party financial resources, savings measurement and verification, and plant and financial feasibility assessments.

DOE understands that industries and companies are not all the same and, accordingly, the Pledge allows participants the flexibility to adopt methods for measuring and tracking energy-intensity data that will reflect their specific requirements and unique business operations. In turn, ITP agrees to provide access to all federal- and state-level program information, contacts, and products related to energy efficiency, carbon and greenhouse gas reduction, and industrial competitiveness. ITP also offers technical and financial assistance, as well as national recognition for companies that achieve exemplary energy-management performance.

As DOE pushes for long-term solutions, part of the goal is to also promote the idea of “energy management”—meaning designating an energy leader or energy manager to regularly monitor energy use and execute future plans. The LEADER Companies signing the Pledge are asked to come up with an energy plan and designate this energy ambassador within a year, as well as provide their emissions annually to the department. As indicated by the LEADER title, those who took the Pledge at the signing ceremony are more than just first actors on the path of making a great leap in energy efficiency; they are establishing themselves as role models and pace setters for others in the industrial sector.

Interested companies can find more information at the *Save Energy Now* LEADER Web site, <http://www.eere.energy.gov/industry/saveenergynow/leader.html>, or can e-mail the program at [SaveEnergyNow@ee.doe.gov](mailto:SaveEnergyNow@ee.doe.gov).



*Save Energy Now LEADER representatives pose together after the Pledge-signing ceremony.*

# Targeting the U.S. Cement Industry for Energy and Carbon Reductions

Just as cement is the binding “glue” in concrete production, the U.S. cement industry is the building block of the nation’s construction industry. Cement manufacturing accounts for 1–2 percent of U.S. industrial energy use, but more than 5 percent of the nation’s industrial carbon dioxide (CO<sub>2</sub>) emissions.<sup>1</sup> The most energy-intensive step in modern cement manufacturing is the calcination reaction, which requires extremely high temperatures—up to 3000°F (1700°C)—in order to transform limestone (calcium carbonate) into lime (calcium oxide), a necessary component of cement. CO<sub>2</sub> emissions result from the combustion of fuel used to reach these high temperatures, but are also produced as a byproduct of this calcination reaction. Overall, the resulting emissions are disproportionately large when compared to those produced by other industries. With few viable alternatives currently available and the worldwide demand for cement increasing, investment in energy- and CO<sub>2</sub>-reducing technologies and processes in the cement industry represents one key opportunity to help the United States attain its energy and climate goals.



**Figure 1.** The Hoover Dam (background) used 3.25 million cubic yards of concrete to build, while the still-under-construction Mike O’Callaghan–Pat Tillman Memorial Bridge (foreground) will require a further 32,000 cubic yards of concrete.

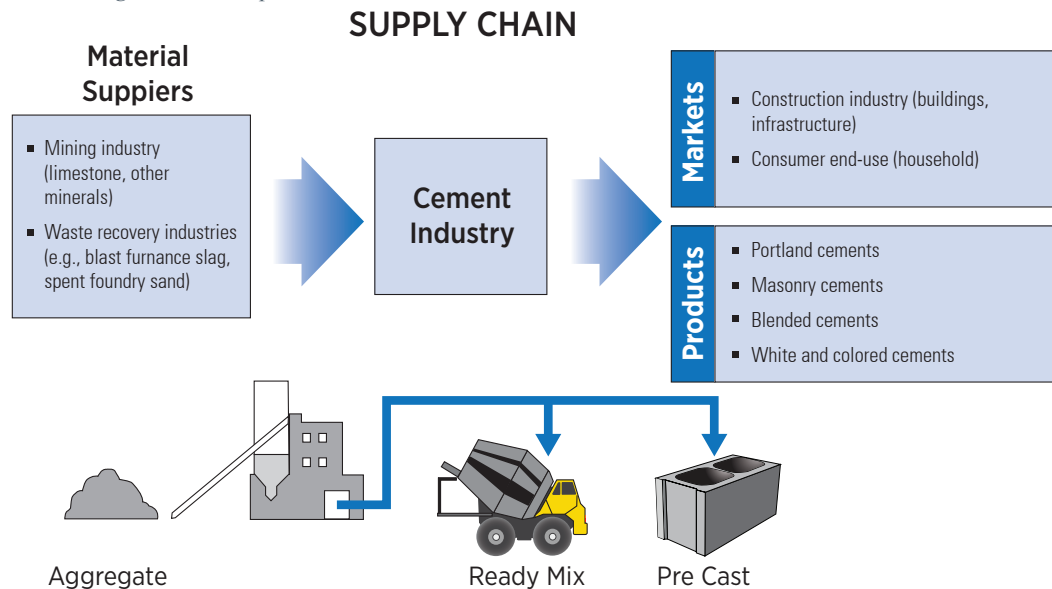
Source (photo): <http://www.dailymail.co.uk/news/article-1197544/THE-WIDER-VIEW-Taking-shape-new-bridge-Hoover-Dam.html>

Source (stats): <http://www.usbr.gov/lc/region/pao/brochures/faq.html#concrete>, <http://www.tfhr.gov/pubrds/09mar/02.htm>

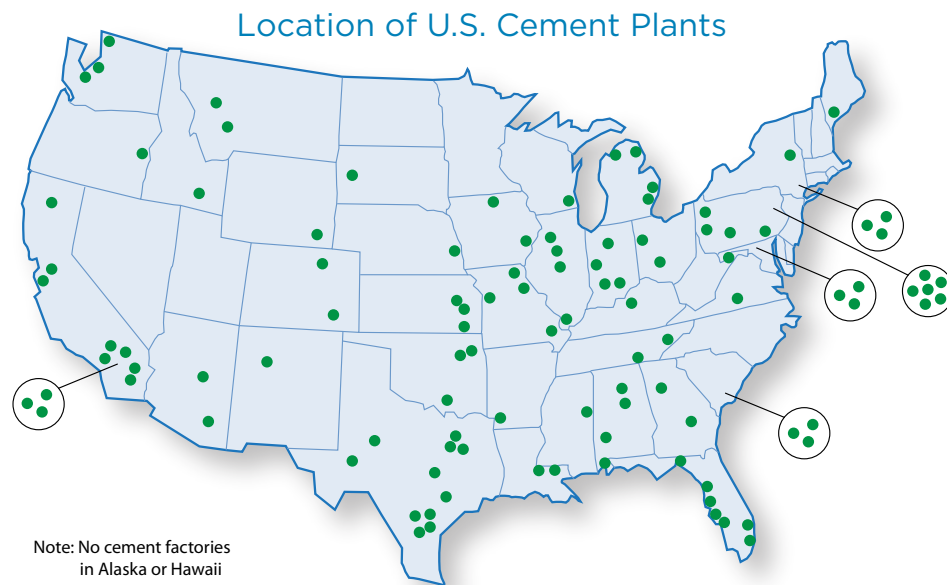
## Industry Stakeholder Workshop

In September 2009, the U.S. Department of Energy’s Industrial Technologies Program (ITP) convened at the Cement Energy and CO<sub>2</sub> Reduction Opportunities workshop in San Francisco,

**Figure 2.** Cement industry supply chain.  
Source: 2008 Industrial Technologies Market Report.



<sup>1</sup>Department of Energy – Energy Information Agency



**Figure 3.** The U.S. cement industry consists of approximately 113 cement plants across 36 states.

Source: *The Portland Cement Association (PCA)*.

California. The purpose of this collaborative two-day workshop was to help develop a national perspective to identify the opportunities, barriers, and pathways to significantly increase energy efficiencies and reduce CO<sub>2</sub> emissions from the cement production process. In support of this goal, the workshop gathered representatives of established cement industry leaders, including CalPortland, CEMEX, Lafarge, and Lehigh Hanson; emerging cement technology entrepreneurs such as Calera, CalStar Products, and Novacem; government entities including the National Institute of Standards and Technology, Environmental Protection Agency, California Air Resources Board; and several national laboratories. Also invited were representatives from the Portland Cement Association, the National Ready Mixed Concrete Association, and a variety of other representatives from associated industries, academia, and venture capital, as well as other interested parties.

### IPT to Release Report on Workshop Findings

Based on input from the workshop participants, IPT will be releasing a report in the coming months that identifies

- Opportunities to increase cement industry energy efficiency and reduce CO<sub>2</sub> emissions using established, best-available technologies and policy instruments
- Long-term transformational technologies and supporting policies that have the potential to drastically reduce cement industry CO<sub>2</sub> emissions.

More than 90 percent of cement manufacturing CO<sub>2</sub> emissions is generated from the calcination reaction process and the combustion of fossil fuel (primarily coal). Overall, for each tonne of cement clinker produced in the United States, approximately

1 tonne of CO<sub>2</sub> is released,<sup>2</sup> well above the average release of many other countries with more efficient cement industries.<sup>3</sup> In addition, U.S. cement producers use more energy per tonne of cement clinker produced than many other industrialized nations.<sup>4</sup> While differences in cement kiln technology represent one reason for these disparities, the European Union, Japan, and other regions have also adopted other strategies to reduce their cement manufacturing energy and CO<sub>2</sub> footprints, such as greater use of alternative fuels for kiln heating and broader substitution of cement clinker with less energy- and CO<sub>2</sub>-intensive materials, such as coal fly ash.

The to-be-released IPT report will highlight proven actions cement manufacturers can take to make an impact in reducing energy intensity and CO<sub>2</sub> emissions in the near term. These proven actions include the adoption of best-available technologies, such as dry kilns with the latest preheater–precalciner technologies, investment in combined heat and power and organic rankine systems, or increased utilization of alternative fuels and clinker substitutes in cement manufacturing. A variety of policies, regulations, and financial incentives can help facilitate these options.

### Significance of the U.S. Cement Industry

- Ranks among top three manufacturers of cement in the world, behind only China and India
- Directly contributes over 17,000 jobs to the U.S. economy in addition to the hundreds of thousands of jobs involved in construction and infrastructure development

<sup>2</sup> 2007 USGS Minerals Yearbook: Cement: <http://minerals.usgs.gov/minerals/pubs/commodity/cement/myb1-2007-cemen.pdf>

<sup>3</sup> IEA Tracking Industrial Energy Efficiency and CO<sub>2</sub> Emissions: [http://www.iea.org/textbase/nppdf/free/2007/tracking\\_emissions.pdf](http://www.iea.org/textbase/nppdf/free/2007/tracking_emissions.pdf)

<sup>4</sup> Ibid.

In addition to actions that can have near-term impacts, the report will highlight transformational technologies and supporting policies that have the potential to significantly reduce long-term cement production CO<sub>2</sub> intensity and contribute to the climate goals. These technologies include the development of alternative cement material systems and material-processing methods, advanced processing agents, and novel carbon capture and storage technologies well-suited for the cement industry. Concerted fundamental science and process research and development (R&D) investigations will need to be concurrently initiated in the near term to allow adequate time for technology maturation and widespread adoption.

### Charting a Sustainable Path Forward

Cement will remain vital to infrastructure development for the foreseeable future. Existing cement processing methods will need

to be transformed in order to meet the Obama Administration's ambitious U.S. climate goals. While various programs sponsored by the Portland Cement Association, the Asia Pacific Partnership, and the World Business Council on Sustainable Development have begun to address the environmental impacts of cement production, more creative methods and concerted R&D efforts will be required to meet the Administration's aggressive goals. ITP is spearheading these R&D efforts in the cement arena to make cement manufacturing sustainable and the industry viable well into the future.

## Save Energy Now Takes a New Approach to Energy Reduction

Guided by the *Energy Policy Act of 2005*, the U.S. Department of Energy's (DOE's) Industrial Technologies Program (ITP) set a goal that aims to drive a 25-percent reduction in industrial energy intensity in 10 years (*25 in 10*) through its *Save Energy Now* initiative. ITP has partnered with industry stakeholders to achieve this ambitious goal and has invited leaders of industrial companies to take a voluntary Pledge to reduce their facilities' energy intensity by 25 percent or more over the next 10 years and be recognized as *Save Energy Now* LEADER Companies.

On December 2, 2009, individuals from 32 companies representing a broad range of the U.S. industrial sector gathered in Washington, D.C., to demonstrate their commitment to energy efficiency by partnering with ITP and signing the voluntary Pledge. The signing ceremony marked the official launch of DOE's LEADER program, which had already flourished in the short time it had been up and running. Eleven companies had already committed to the *25 in 10* goal at the Midwest Industrial Energy Efficiency Exchange in Detroit, Michigan, on September 9–10—and just 3 months later, 21 more companies had joined the initiative, with 10 more following suit after the December 2 event.

To date, 44 LEADER Companies have not only made considerable commitments to energy efficiency that will lead to

significant energy and carbon savings and a clean-energy future, but have also stepped up to the plate as role models and pace setters for others in the industrial sector. LEADER Companies do not simply sign a Pledge in order to obtain resources—they make a commitment to action. These companies develop energy-intensity baselines and energy-management plans and report their progress to ITP on an annual basis. To help LEADER Companies achieve the aggressive *25 in 10* goal, beginning in 2010, ITP has changed its *Save Energy Now* initiative to improve the way it delivers resources to its partners. Moving forward, the focus of *Save Energy Now* will be directed toward providing LEADER Companies with support and priority access to the resources and tools that are essential to becoming more energy efficient. Among the improved resources are Technical Account Managers (TAMs), enhanced Energy Saving Assessments (ESAs), and a multitude of other technical assistance.

### Technical Account Managers

The LEADER program is implemented by two integrating contractor teams lead by Oak Ridge National Laboratory and Project Performance Corporation/AEA Technology. Each LEADER is assigned a TAM from one of the two integrating contractor teams that acts as an energy-management expert and provides tailored technical assistance to help the company reach the Pledge goal, which includes assistance in developing an

energy baseline and energy-management plan; regular progress reviews to measure how well the company is able to achieve energy-saving project implementation; and notification when new opportunities, programs, or resources become available from DOE and others. The TAM undertakes a series of initial evaluation activities in coordination with the LEADER to determine the most appropriate type and level of services to be provided by the program. TAMs also provide LEADER Companies with training that teaches them the long-term skills necessary to self-sustain energy efficiency efforts.

### Enhanced Energy Saving Assessments

Prior to 2010, any company nationwide could partner with ITP to participate in no-cost energy audits and assessments to identify savings opportunities in their facilities' operations. Those companies that do not join the *Save Energy Now* LEADER initiative are still offered a number of tools and resources that will help them save energy and money, including online downloads and access to hand-picked resources that support energy efficiency efforts, however, traditional open access to energy assessments is no longer available to those who have not taken the Pledge. Companies can still apply for ESAs, but priority access will be granted to LEADER Companies.

ITP is focused on advancing efficiency actions that will result in the best British thermal unit (Btu)-saved-per-dollar investment, and therefore is offering its enhanced on-site ESAs to LEADER plants that have the largest energy-intensity-improvement potential, and implementation ability through leveraged cost-share. Specifically, a plant must use 0.5 trillion Btu per year or greater to qualify for an enhanced ESA. To perform the assessments, ITP has newly contracted Energy Experts who will help companies identify ways to improve efficiency. Additional benefits plants receive include tailored recommendations, follow-up support, return on investment calculation assistance, and CEO/plant management outreach.

Any plant that uses less than 0.5 trillion Btu of energy annually, LEADER or non-LEADER, will be directed to apply for traditional ESAs, and assessment opportunities offered by ITP-sponsored Industrial Assessment Centers, State and Regional *Save Energy Now* partnership programs, and Manufacturing Extension Partnership programs.

### Other Technical Assistance

ITP is dedicated to supporting LEADER Companies in meeting their energy-reduction targets and will provide them with personalized attention, resources, and tools that will assist



them in accomplishing their goals. LEADER Companies with the potential to achieve significant energy savings may receive training, access and assistance in using DOE software tools to identify energy-savings opportunities, publications, recommendations about utility incentive programs, evaluation of new technology deployment opportunities, services from state *Save Energy Now* programs and the *Save Energy Now* ALLY program, and information on energy-management standards.

Another supplementary resource that LEADER Companies will have access to is an electronic information Portal that acts as a multifunctional tool, housing a large amount of technical information, tools, resources, and contacts. The Portal is also designed to help each LEADER and TAM easily track progress and store energy-intensity information and details regarding planned and implemented projects.

### How to Get Involved

ITP invites companies to become a *Save Energy Now* LEADER and begin reducing their energy use, carbon emissions, and costs while increasing economic viability. Working together, ITP and U.S. industry can continue leveraging the potential of energy efficiency to provide near- and long-term job creation and increase America's economic competitiveness.

The first step to becoming a *Save Energy Now* LEADER is to sign the Pledge and voluntarily commit to reducing your company's energy intensity by 25 percent or more in 10 years. Interested companies can find more information at the *Save Energy Now* LEADER Web site, <http://www.eere.energy.gov/industry/saveenergynow/leader.html>, or can e-mail the program at [SaveEnergyNow@ee.doe.gov](mailto:SaveEnergyNow@ee.doe.gov).

# Copenhagen Summit Comes to a Close

*Accord Commits Developed Nations to Reducing Emissions by 2020*

Copenhagen, Denmark, hosted the annual United Nations (U.N.) Climate Change Conference on December 7–18, 2009. The event brought together representatives and a multitude of world leaders from more than 190 countries, including the President of the United States, Barack Obama. Delegates and attendees of the two-week conference sought to establish a binding agreement on climate-change mitigation that would succeed the Kyoto Protocol—the first legally binding treaty for developed countries to reduce their greenhouse gas (GHG) emissions—which is set to expire in 2012. Heads of state, working into the late hours of the last day, reached a legally nonbinding accord for GHG reductions. In its current form, the Copenhagen Accord is not a successor to Kyoto. Obama Administration officials, holding firm on various preconditions, understood the disappointment for Copenhagen’s outcome after the conference concluded, but President Obama promised further work on securing a deal.<sup>1</sup> Many of the sticking points that held up the talks were nothing new (historically speaking), but meetings are expected to continue later this year.<sup>2</sup>

Commonly referred to as the Copenhagen Summit, this event was the culmination of two years’ worth of meetings and negotiations that began in Bali, Indonesia. U.N. officials and other ministers, under the United Nations Framework Convention on Climate Change, met annually to discuss progress on climate-change mitigation. Bali conference attendees produced the *Bali Road Map*, a plan for a secure climate future in which countries would agree to a successor to the Kyoto Protocol by 2009.<sup>3</sup> The Copenhagen Summit was the target for reaching an agreement.

In the months leading up to the Copenhagen Summit, world leaders and U.N. officials were optimistic about reaching an agreement in Denmark. Not only had negotiations been moving in that direction, but they viewed President Obama’s election as a renewed opportunity to sign a new treaty. Indeed, President Obama has made climate-change mitigation a priority in his agenda. Throughout 2009, his administration pushed greater international engagement on this issue in talks and other high-level meetings with various countries.<sup>4</sup> Despite this push, however, a few weeks before the Copenhagen Summit, U.S. officials began to express doubt that a full binding treaty would get signed. Michael Froman, the U.S. deputy national security adviser for international economic affairs, specifically stated that early “...negotiations have [not] proceeded in such a way that

## The Carbon Connection

*Carbon dioxide (CO<sub>2</sub>) represents the crux of the climate-change problem. Part of the human respiratory process and recurring elsewhere in nature, CO<sub>2</sub> is a byproduct of fossil fuel combustion. It has contributed the most to the anthropogenic greenhouse effect given its rising concentration, though it is not the most potent greenhouse gas. The challenge both domestically and internationally—as was highlighted during the Copenhagen Summit—lies in curbing its atmospheric concentration. More directly, curbing its production poses unique challenges for the United States industrial sector, and what follows is a brief overview.*

Dealing with CO<sub>2</sub> can seem especially difficult due to several immovable circumstances. Though unanimity and the impact of climate change is not absolute, a recent survey by the University of Illinois found that 97 percent of over 3,000 of climate scientists believe that human activity is contributing to climate change.<sup>5</sup> Further, the United States National Academy of Science, the United States’ chief public scientific body, believes climate change is occurring.<sup>6</sup> Reducing emissions, then, is critical—but this has been difficult.

As the 2nd largest emitter in the world, putting a price on or regulating CO<sub>2</sub> emissions in the United States could potentially cause fossil-fuel-based electricity to rise in cost. Energy-intensive industries such as cement production or refining—or even industries that use combined heat and power systems—could face more direct impacts to their business. Investing in newer, cleaner technologies inevitably takes time to scale-up and alter the large-existing energy infrastructure. This is not an easy issue to alter overnight.

Conversely, there are other opportunities for solving the carbon issue. The EPA has recently announced that it intends to establish permitting rules regulating CO<sub>2</sub> emissions for facilities that emit over 25,000 tons per year.<sup>7</sup> While President Obama, Secretary Chu, and many other officials would rather see a legislative solution, if industry can find ways to save energy, that can put companies at a competitive advantage. Establishing a market price for carbon might allow energy efficient companies (or ones that use clean energy) to profit, too. It could also create new opportunities in green manufacturing. Manufacturing regions hit hard by the most recent recession could find new economic opportunities in renewable energy. Michigan is one state, for example, that has recently pursued this strategy.<sup>8,9</sup> Though this information is far from a complete picture, it represents a brief, if abridged, version of the many complex issues surrounding carbon.



any of the leaders thought it was likely that we were going to achieve a final agreement in Copenhagen...”<sup>5</sup>

Nevertheless, the Obama Administration pressed on as the conference opened, hoping that delegates could reach an agreement, and it made several steps signaling its increased commitment. Top Obama aides promised “robust negotiations” toward a deal.<sup>6</sup> The Department of State hosted the first on-site “U.S. Center” for meetings and presentations.<sup>7</sup> Numerous public officials attended the conference, including Energy Secretary Steven Chu, Secretary of State Hillary Rodham Clinton, Commerce Secretary Gary Locke, Agriculture Secretary Tom Vilsack, and Interior Secretary Ken Salazar—as well as Environmental Protection Agency (EPA) Administrator Lisa Jackson, a congressional delegation, California Governor Arnold Schwarzenegger, and New York City Mayor Michael Bloomberg. Simultaneously, the EPA announced that GHGs posed an endangerment to human health.<sup>8</sup> Analysts and many leaders believed the ruling was purposefully announced in December to signal U.S. seriousness with climate change and to enhance the United States’ negotiating position, given that the Waxman–Markey climate-change bill stalled in Congress.<sup>9,10</sup> Negotiators for the United States offered commitments in line with Waxman–Markey: a 17-percent cut from 2005 levels by 2020 and an 83-percent reduction by 2050.<sup>11</sup> In addition to emission cuts, the United States offered funding for developing nations, given that they may have greater difficulty adapting to climate-change effects, such as rising seas or increased droughts.<sup>12</sup>

Despite representatives’ numerous attempts to reach a deal, conference negotiations fluctuated and participating countries failed to overcome barriers that have held back previous negotiations.<sup>13</sup> Under Kyoto, developing countries and developed countries are treated differently. Developed countries—being the historical emitters—are obligated to reduce emissions, whereas developing countries are under no limits.<sup>14</sup> Given the existing treaty and categories, splits occurred on these divisions. Developing countries criticized the developed world’s pledges to reduce emissions. Talks stalled for several days as draft agreement texts sought a new successor treaty to Kyoto, which would have curbed developing countries’ ability to emit.<sup>15</sup> China (the world’s largest emitter but currently under no obligation to reduce emissions as a developing country) offered, however, a 40- to 45-percent reduction of energy intensity by the year 2020. The developed world offered funding to help countries manage the effects of climate change, such as rising seas or increased droughts. The United States specifically stated that it would not provide reparations for its historic role in GHG emissions, and lead representatives specifically stated that China would not

receive funding.<sup>16</sup> More importantly, U.S. officials stated that any deal would be contingent upon international verification of emissions reductions. China and other developing countries such as India viewed this as a threat to their sovereignty, but it was perhaps crucial, as China has provided what some consider to be questionable statistics in the past.<sup>17</sup>

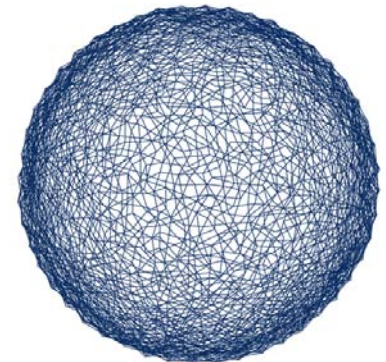
As President Obama’s planned arrival neared, progress was slow coming. As leaders arrived, many of the stumbling blocks concerning, for example, emission cuts and international verification had not been worked out. President Obama met with other world leaders and managed to forge a deal late into the night of Friday, December 18.<sup>18</sup> The three-page, legally nonbinding Copenhagen Accord commits developed nations to reduce emissions by the year 2020 and called for developing countries to also voluntarily cut emissions. It calls for global temperature levels to remain below 2 degrees Celsius. The Accord outlines specific funding levels to developing countries. International verification issues were mentioned but left unresolved.<sup>19</sup> Countries are to submit their reduction commitments in 2010.

President Obama and other world leaders provided candid reactions once they returned home. British Prime Minister Gordon Brown said that a global deal should never “be held to ransom by only a handful of countries.”<sup>20</sup> U.K. Energy and Climate Change Secretary Ed Miliband stated that China, Sudan, Bolivia, and several other nations “hijacked” a deal.<sup>21</sup> President Obama said that “people are justified in being disappointed about the outcome in Copenhagen.” He defended the outcome by commenting, “rather than see a complete collapse in Copenhagen...at least we kind of held ground and there wasn’t too much backsliding from where we were.”<sup>22</sup>

Negotiations will continue throughout this year, and another U.N. conference is scheduled for December 2010 in Cancun, Mexico.

#### Additional Reading

<http://www.whitehouse.gov/the-press-office/remarks-president-morning-plenary-session-united-nations-climate-change-conference>.



COP15  
COPENHAGEN  
UN CLIMATE CHANGE CONFERENCE 2009

## Endnotes

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## Success in Industry

# Licensing Agreement Makes New Industrial Technology Commercially Available

Gas Technology Institute (GTI)—a leading research, development, and training organization serving energy and environmental markets—and Cannon Boiler Works, Incorporated (Cannon)—a leading supplier of boiler economizers—recently signed a licensing agreement that will soon make the new transport membrane condenser (TMC) technology commercially available. TMC captures waste heat and water vapor from exhaust/flue gas for reuse and is applicable to industrial and commercial boilers, as well as elevated-temperature industrial processes. Beneficial results of TMC include increased operating efficiency and lower overall energy costs. Additionally, when used with industrial and commercial boilers, it is the cornerstone of a state-of-the-art heat recovery system that can provide an increase in fuel-to-steam efficiency of as much as 15 percent (up to 95 percent fuel-to-steam efficiency) and up to 20 percent water capture and reuse without the need for water treatment.



TMC models, covering a range of boiler sizes, are expected to be available for commercial sale this year. It is anticipated that TMC will enter the large industrial watertube boiler market in 2010–2011 and will be introduced to selected applications in the paper and steel industries in the 2011–2012 timeframe.

GTI is the inventor and patent-holder of the TMC technology, which has been licensed exclusively to Cannon for certain fields of use. The technology is a key element of the U.S. Department of Energy's Super Boiler program and was developed with co-funding from the Department of Energy; Utilization Technology Development, NFP; California Energy Commission; California Air Resources Board; South Coast Air Quality Management District; Southern California Gas (a Sempra Energy Company); and GTI and its Sustaining Membership Program.

# Superior Energy Performance Texas Pilot Project Produces Results for CCP

Cook Composites and Polymers (CCP), a world leader in the production and distribution of synthetic resins, is one of five plants that has partnered with the U.S. Department of Energy's (DOE's) Industrial Technologies Program to participate in the U.S. Council for Energy-Efficient Manufacturing-guided Superior Energy Performance Texas Pilot Project, which tests the criteria and assessment methods for a voluntary energy efficiency certification program for manufacturing plants.

CCP's manufacturing facility in Houston, Texas, began participating in the pilot project in 2008 with high expectations. Between 1998 and 2005, the plant had experienced a dramatic increase in its energy expenditures, with an escalation from \$600,000 to \$1.8 million in annual costs. In 2008, energy was



the second largest cost for the plant, accounting for 20 percent of the plant's operating budget. In September 2008, DOE energy experts tested the proposed system assessment standards for steam and process heating systems—and through the two assessments, opportunities were identified that could save the plant 30 percent of those systems' natural gas use. CCP has implemented short-term actions and low-cost investments that have already resulted in savings of \$40,000.

CCP has also been successful in incorporating its new energy-management system into its already robust and integrated health, safety, quality, and environmental-management system. Use of

the existing management-system structure for implementation of the energy-management system has been beneficial, as it exposed other CCP sites not participating in the pilot project to energy-management system concepts. More employees, beyond those participating in the pilot, have become aware of energy-management processes, and implementing energy management with a cross-functional team has helped to ensure more likely success through support that extends beyond the plant boundaries.

For more information, visit [http://www.superiorenergyperformance.net/texas\\_pilot.html](http://www.superiorenergyperformance.net/texas_pilot.html).

## States & Utilities Corner

# 2010 Industrial Utility Webinar Series

ITP has partnered with Western Area Power Administration, the American Public Power Association (APPA), and APPA's Demonstration of Energy-Efficient Developments to host a six-part Webinar series in 2010. These monthly Webinars are designed to help all utilities work with their industrial customers on improving their energy efficiency. A general open session was held in January, with an open session on public power hosted in February. Future topics include the following:

- Financial Mechanisms and Incentives for Implementing Efficiency Measures (March 10)
- Natural Gas Utility Efficiency Programs (April 14)
- Public Power Financial Incentives (May 12)
- Combined Heat and Power Case Studies (June 9).

For more information or to register, please contact Ryan Harry at [rharry@bcs-hq.com](mailto:rharry@bcs-hq.com). Slides from previous Webinars are available for download on the utilities partnerships training page of the *Save Energy Now* Web site: <http://www1.eere.energy.gov/industry/utilities/training.html>.



## In the Spotlight: Wisconsin

**F**ocus on Energy (Focus) is a state-based program that works with eligible Wisconsin residents and businesses to install cost-effective energy efficiency and renewable energy projects. Focus information, resources, and financial incentives aid in the implementation of projects that otherwise would not be completed. Its efforts help Wisconsin residents and businesses manage rising energy costs, promote in-state economic development, protect the environment, and control the state's growing demand for electricity and natural gas.

- **Financial Incentives:** Focus offers industry prescriptive incentives for the purchase and installation of energy efficient repulper and pressure screen rotors, radiant tub inserts for heat treating, and radiant heater bands for plastics. Prescriptive incentives are also available to help fund a pump system study in pulp and paper facilities. Focus also offers customizable financial incentives for local industry to improve their energy efficiency outside of what is offered through its prescriptive incentives program. An industrial manufacturer must meet with a Focus advisor to identify and approve any custom incentive before the manufacturer implements a project. Focus also periodically releases requests for proposals for other custom programs.
- **Technical Incentives:** Focus provides a portfolio of technical services and resources for Wisconsin industry. For example, Focus energy managers can work with an industrial manufacturer to identify ways to make processes more efficient and to use energy more effectively. Focus offers a self-assessment that companies

can take to evaluate their facilities without an energy manager. Focus also provides measurement verifications to help industrial managers calculate potential energy and cost savings after changing a process or purchasing energy efficient equipment (vendors for such equipment are listed on the Focus Web site). In addition, Focus provides education and training and offers a clearinghouse of industrial energy efficiency documents including fact sheets and case studies.

Focus is also a *Save Energy Now ALLY*. For more information on Focus on Energy, please visit the Focus Web site at <http://www.focusonenergy.com/Business/Industrial-Business/> or call 800-762-7077.



### Tools of the Trade

## Quick PEP and the Integrated Tool Suite

**T**he Quick Energy Profiler, or Quick PEP, is a free online software tool that will help U.S. industrial plant managers improve energy management at industrial facilities. The tool helps users establish a baseline for how energy is being used at their plant, identify opportunities to save energy and money, and calculate carbon dioxide (CO<sub>2</sub>) emissions. Quick PEP is designed so that the user can complete a plant profile in about an

hour and the results will enable plants to focus on improving the performance of major energy-consuming systems within their plant.

The Integrated Tool Suite software tool is similar to Quick PEP, but can be downloaded to a desktop as a stand-alone tool and does not require an Internet connection to use. In addition to its Energy Intensity Baseline Spreadsheet and CO<sub>2</sub> Footprint Calculator, the suite features system-specific scorecards for quickly estimating savings opportunities.

## Annual Electricity Energy

## Annual Fuel/Steam Energy

Use this screen to define the percent of total annual electricity that each major system in your plant consumes. If you do not know what percentages to enter, click on the Use Worksheet button to fill out a usage worksheet and let Quick PEP calculate the percentages for you.

**NOTE:** Quick PEP provides U.S. default percentages for you based on the industry that you selected for this case. You may use these default percentages if you are unsure of the actual percentages that each energy use system uses. However, for more accurate results you should estimate your actual percentages and enter them in the boxes below.

Energy Use System	Percentage of Total Electricity	Energy (kWh)	Energy (MMBtu)	Cost
<a href="#">Combined heat and power (cogeneration)</a>	0 %	0	0	\$0
<a href="#">Compressed air</a>	9 %	12,493,430	42,629	\$638,010
<a href="#">Industrial Facilities: (Lighting, HVAC, and Facility Support)</a>	5 %	6,940,794	23,683	\$354,450
<a href="#">Fans and Blowers</a>	7 %	9,717,112	33,156	\$496,230
<a href="#">Materials handling</a>	2 %	2,776,318	9,473	\$141,780
<a href="#">Materials processing</a>	16 %	22,210,542	75,786	\$1,134,240
<a href="#">Process cooling and refrigeration</a>	32 %	44,421,083	151,571	\$2,268,480
<a href="#">Process heating</a>	0 %	0	0	\$0
<a href="#">Pumps</a>	21 %	29,151,336	99,468	\$1,488,690
<a href="#">Steam Generation Equipment</a>	3 %	4,164,477	14,210	\$212,670
Other	5 %	6,940,794	23,683	\$354,450
<b>Total</b>	<b>100 %</b>		<b>473,659</b>	<b>\$7,089,000</b>

Update Table

Reset to Defaults

Use Worksheet

Previous

Next

Quick PEP and the Integrated Tool Suite are designed for industrial plant managers and personnel who have access to basic information about major energy-consuming systems at their industrial plants. These tools are easy to use and require no specialized knowledge of the software because the online tutorial takes users through the software step by step (See **Step 7, Energy Use and Distribution**, above).

To use Quick PEP and the Integrated Tool Suite, you will need to input the following data:

- Average utility bill information
- Average production information

- Major energy-using systems
- Score cards (optional)
- Average energy usage information.

Based on input, the tools will provide the following:

- Energy use and cost per unit of production
- Annual purchased energy
- Potential annual energy savings and related emission reductions
- Customized list of next steps, including recommended ITP software tools for further analysis of specific systems.

## Newly Added Features of Quick PEP

Version 2.0 of Quick PEP includes the addition of Chinese language support for the whole software tool. Other features include an Energy Intensity Spreadsheet for expanded baseline capabilities and a CO<sub>2</sub> Footprint Calculator.

The Energy Intensity Spreadsheet will track a company's annual energy use and changes in energy intensity for one or more units of production within their plant(s). Energy intensity is broadly

defined as the amount of energy use per unit of output. The Quick PEP CO<sub>2</sub> Footprint Calculator provides a detailed analysis of a plant's annual change in both absolute energy use and related CO<sub>2</sub> emissions in tons and metric tons, which is based on a selection of up to 24 carbon-based energy sources.

To get started using Quick PEP, or to find out more, visit [http://www1.eere.energy.gov/industry/quickpep\\_ml/default.aspx](http://www1.eere.energy.gov/industry/quickpep_ml/default.aspx).

## Research & Development

# Desalination

## *Tapping New Water Resources*

**D**esalination is the removal of salt (sodium chloride) and other minerals from water in order to make it fit for use, either for drinking or for industrial purposes. Although desalination technology is commercially available, the high capital costs of the technology and its energy intensity can render it impractical for large-scale, commercial applications. New technologies are reversing this trend, however, and as the cost of augmenting water supplies through other means steadily increases, the result is that desalination is becoming a technically and economically feasible option in many cases.

Numerous reports have outlined the increases in water withdrawals from traditional water resources, such as underground aquifers, reservoirs, and rivers. In many parts of the United States where traditional water resources are scarce or have been depleted, nontraditional resources—such as brackish aquifers, “process water” from oil and natural gas extraction, and municipal and industrial wastewater—are increasingly of interest for use in municipal water systems and for commercial and industrial processes. While the prospect of using processed wastewater for residential application may be unappealing and impractical, only a small fraction of this water (about 10 percent of daily water consumption) is actually used for drinking and bathing. Increasing the use of nontraditional water resources for applications that may not require potable water will likely reduce pressure on drinking water supplies and alleviate some of the conflict between industrial and residential demand.

### Examples of Applications for Desalination Technology

- On-site desalination systems for recycling water used in industrial processes
- Increased reclamation of municipal waste water for residential, industrial, and agricultural use
- Co-location of desalination facilities with thermal power plants to maximize use of waste heat and steam

### Technology and Process Research & Development

Desalination technologies fall into two main categories: membrane desalination processes (which involve removing salt from water by forcing it across a membrane, either through mechanical force or with an electric current) and thermal desalination processes (which remove salt through a phase change brought about by a change in temperature and pressure). Although there are variations on each, the processes retain these basic characteristics; both are highly energy intensive. There are additional technologies—such as desalination through chemical catalysts—but these are generally reserved for niche applications such as high-purity industrial washing.

While there have been incremental advancements in desalination, particularly in improving the capacities of reverse osmosis systems, gains have been relatively modest. Much of the increase in desalination capacity has been due to external economic factors as opposed to dramatic shifts in the efficiency of desalination technology.

Much of the research and development (R&D) efforts in the desalination field are focused on technologies and processes that reduce the energy intensity of desalinating water. These efforts focus on reducing the energy required for a given process or by increasing the amount of water produced per unit of energy input. Future R&D needs include fundamental changes in process technologies that have the potential to shift the production and recycling of water through desalination by drastically reducing the capital and maintenance costs while increasing efficiency.

Reverse osmosis is the primary desalination process currently used in the United States and the majority of the energy required is utilized in mechanically generating the force needed to overcome the osmotic pressure of the solution and driving water across a membrane. A major R&D focus for reverse osmosis processes is in high-efficiency reverse osmosis systems that employ chemical pretreatments, which, in addition to particulate filtration, adjust the pH and ionic concentrations to reduce the amount of energy required to drive water across the membranes. The benefits of the process are reduced-mineral scaling, increased water recovery, and a reduction in overall capital costs for higher-capacity (>50 gpm) systems.

There are also several technology processes for which nanotechnology applications may promote improvements in performance, including carbon-nanotube-based desalination membranes—which may be able to increase the flow of water while reducing the energy input required—and resisting fouling. Additionally, nanotech electrodes for electrodialysis techniques may offer greater corrosion resistance and ease of operation, which could increase overall process efficiencies.

In February 2010, the U.S. Department of Energy's Industrial Technologies Program (ITP) convened a dual-track workshop at which industry experts, scientists, and federal employees addressed the direction of technology research on both desalination and industrial water-use efficiency. The results of this workshop will be used to direct ITP activities and to facilitate the spread of policies, technologies, and processes.

The following desalination process and technology areas are likely to benefit from additional R&D in the future:

- Novel process designs for hybrid systems that employ thermal- and membrane-based technologies, including the continuing development of nanotechnology
- Continued development of membrane materials and cartridge/array designs
- Development and integration of energy-recovery devices and processes to maximize the utilization of waste heat and mechanical energy input
- Reduction of capital costs and membrane costs through improved materials and processes
- Surveying of the potential for large-scale injection of waste products into subsurface geologic formations.

### Additional Reading

[Desalination and Water Purification Technology Roadmap](#) (Sandia and Bureau of Reclamation, 2003).

[The Future of Desalination in Texas](#) (Texas Water Development Board, 2008).

[Saving Energy, Water, and Money with Efficient Water Treatment Technologies](#) (NREL, 2004).





## Markets & Trends

# Rising Raw Materials Costs

The chemicals and allied industries (refining and forest products) face a difficult challenge of planning for future growth, for new products and processes, or for expansion while dealing with uncertainties in raw materials costs. In many sectors

of these industries, materials costs for both feedstocks and fuels are a significant portion of overall costs. Ultimately, many of the raw materials costs are dependent on the cost of petroleum (from crude oil), which is driven by refining capacity and global

**Table 1:** Energy Consumption by Industry

Industry	2006 Consumption (in trillion Btu)
Chemicals	5,149
Refining	6,864
Wood and Paper Products	2,805
<b>All Manufacturing</b>	<b>21,098</b>
<i>Chemicals and Allied Industries</i>	<i>70.2%</i>

Source: Manufacturers Energy Consumption Survey (MECS) 2006, EIA.gov.

**Table 2:** Average Monthly Employment

Industry	2009 Average Monthly Employment (in thousands)
Chemicals	813
Refining	114
Wood and Paper Products	784
<b>All Manufacturing</b>	<b>11,980</b>
<i>Chemicals and Allied Industries</i>	<i>14.3%</i>

Source: BLS.gov.

demand. These factors are, in turn, affected by the speed of growth or decline in the overall global economy, the development of emerging energy-hungry industrializing powers, regional refining interruptions (like hurricanes Rita and Katrina), and the domestic financial and business climate. Ultimately, raw material price fluctuations encourage both positives and negatives. Investment in expansion is curtailed when prices are uncertain or high, and previous capital-intensive investments can fail, resulting in lost jobs and depressed sectors; on the flip side, these uncertainties can lead these industries to close inefficient plants, invest in research and development to create alternative materials and products, and collaborate with other sectors and partners to share risk on new opportunities.

The chemicals and allied industries are some of the nation's largest consumers of energy and raw materials (Table 1) and employ a significant percentage of manufacturing's employees (Table 2). These industries also provide a significant portion of materials to other industries. For example, the chemicals industry provides around 10 percent of the material for computers, 40 percent of the materials for goods in hospitals, and nearly 80 percent of the materials for laminate and vinyl flooring.<sup>1</sup> These industries also contribute a large portion of the total value of U.S. exports (see Table 3). As such, impacts on the costs of doing business in these industries will have a significant effect on all of U.S. industry and business.

<sup>1</sup>Business of Chemistry, 2009

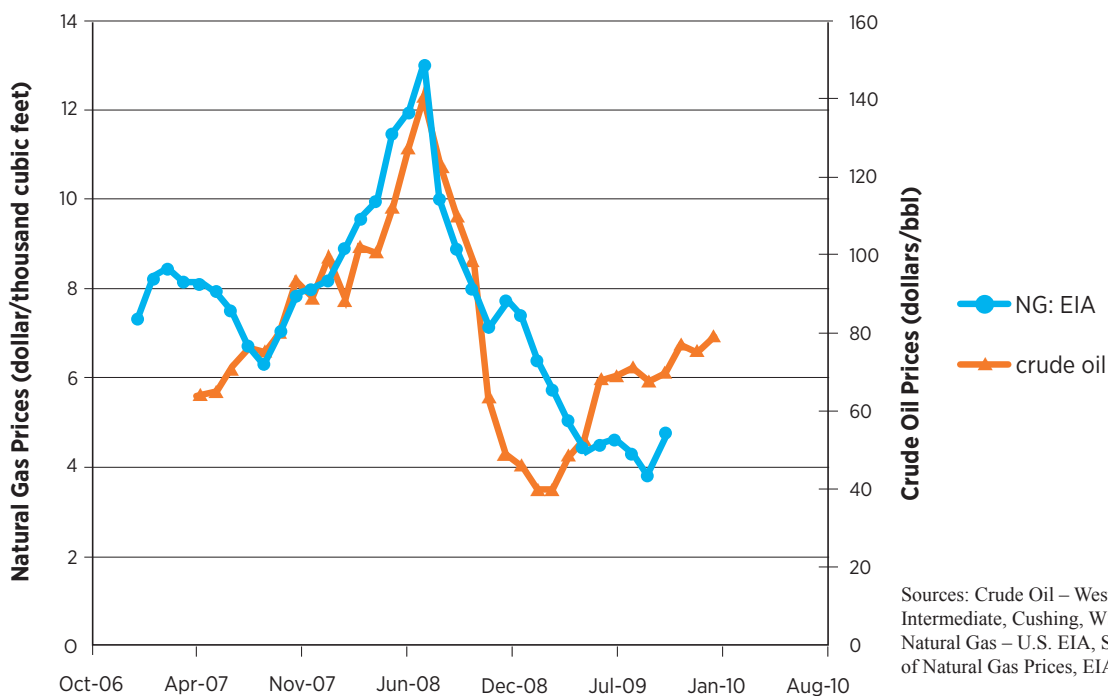
**Table 3:** U.S. Exports

Industry	2008 U.S. Exports (in millions)
Chemicals	171,642
Refining	59,030
Wood and Paper Products	27,792
<b>All Manufacturing</b>	<b>1,111,427</b>
<i>Chemicals and Allied Industries</i>	<i>23.3%</i>
<b>Total United States</b>	<b>1,840,000</b>
<i>Chemicals and Allied Industries</i>	<i>14.0%</i>

Source: Export.gov.

Controlling raw materials costs is critical for these industries. In the production of basic chemicals and specialty chemicals, for example, raw materials are the single largest expenditure. In the refining industry, petroleum is the primary feedstock, and energy costs can make up more than 50 percent of the total cash operating costs (excluding capital and depreciation).<sup>2</sup> One factor leading to increased raw materials costs is the continued industrialization of China and other Asian nations. This increasing global demand for raw materials has raised the prices of many commodities, including the fuel and feedstocks critical to the chemicals and allied industries.

The price of natural gas is a good example of this effect (Figure 1). Natural gas is a product of the refining industry and comes from a variety of sources but is generally associated with other petroleum products. Natural gas is used by a number of industries for both process and nonprocess heating needs and is a major source of home heating in the United States. Natural gas prices have fluctuated greatly over the last couple of years—following the price of crude oil and affecting the prices of its derivative fuel products and feedstock chemicals, as well as the costs of any downstream, natural-gas-consuming industries.

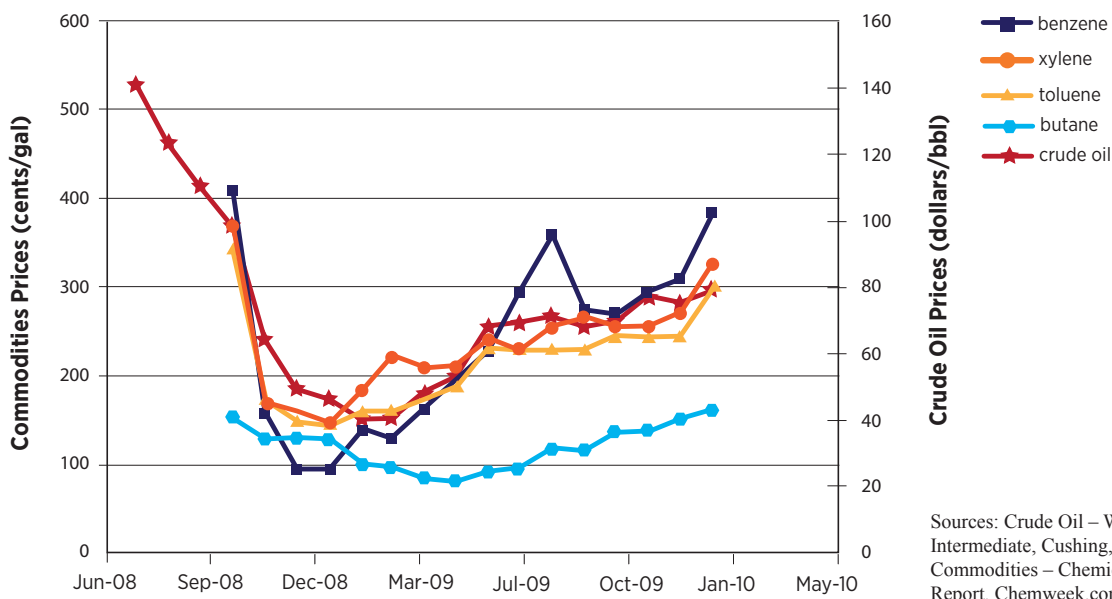
**Figure 1:** Crude Oil and Natural Gas Prices

<sup>2</sup> EnergyStar research: [http://www.energystar.gov/ia/business/industry/ES\\_Petroleum\\_Energy\\_Guide.pdf](http://www.energystar.gov/ia/business/industry/ES_Petroleum_Energy_Guide.pdf)

The chemicals industry is especially susceptible to fluctuations in oil prices because much of its raw materials are also derived from petroleum products. Four of the most widely used, basic commodity chemicals—benzene, xylene, toluene, and butane—are derived from petroleum, and the prices of these products are

closely tied to petroleum costs. The price of crude oil skyrocketed in 2008 due to a variety of reasons, fell in late 2008 to early 2009, and has now rebounded to 2008 levels. The primary feedstocks for the chemicals industry have seen similar fluctuations in price (Figure 2).

**Figure 2: Chemicals Commodities Prices**



Even though the impact of the recent recession has driven down some prices (and though those prices may remain depressed while the global economy recovers), over the long term, these costs are expected to continue to increase. Short- and medium-

term fluctuations in price and unknown future trends make purchasing and expansion plans more difficult for these industries and affect prices for other industries and sectors that consume chemicals or allied industry products.

## Ask the Energy Expert

### Energy Management at 3M

**Dear Energy Expert:**

*My plant is looking for ways to reduce our energy intensity and better manage our energy usage. Can you provide examples of what your company has done to get closer to this goal?*

As a diversified technology company with operations in more than 65 countries and products sold in nearly 200 countries, 3M's corporate leaders quickly realized energy management was essential to not only remain competitive worldwide, but to also increase energy efficiency and reduce energy-intensity emissions. At 3M, energy management has quickly been infused into our corporate culture. We have committed to environmental

initiatives and sustainability initiatives for several decades. In fact, 3M first established its Pollution Prevention Program (3P) in the 1970s to help prevent pollution at its source.

In effort to reduce its environmental footprint, 3M devises a new set of corporate environmental goals every five years. The company's 2005–2010 goals address environmental issues through eco-efficiency and pollution-prevention metrics. These are complemented by individual business unit goals that incorporate product lifecycle management within the unit's strategic plan. Individual plants are tracked on a quarterly basis and progress toward the corporate energy-reduction goals is

evaluated annually. The measurements use targets for percentage reduction in energy use per pound of product produced and the percentage reduction in energy/net sales for a particular time period. Since the inception of 3M's energy-management program in 1973, British thermal units (Btu) per dollar of net sales have dropped significantly. Realizing energy efficiency can also provide a competitive advantage. 3M's Corporate Energy-Management Team has established a model to provide global leadership by controlling energy costs, improving operation efficiencies, reducing environmental impacts, ensuring availability of reliable energy supplies, and implementing a strategic energy-management plan.

In order to meet these goals, an assigned Corporate Energy-Management Team develops annually a strategic energy-management plan. The team outlines annual energy strategy and prioritizes tactics, setting oversight and guidance for division- and plant-level planning processes and integration into the corporate strategic planning process. For 3M to effectively implement these projects and help identify near- and long-term savings opportunities, five main tools are incorporated: strategic road maps of action; gaps in maps; business and country energy plans; facility energy teams; and facility energy assessments. Following the above plan using the tools for implementation and facility energy assessments has led to the success of several energy-reduction projects. More than 185 projects were

### Sample 3M Plant Energy Dashboard

3M										
May 18, 2004	2003 Q1	Q2	Q3	Q4	2003 Total	2004 Goal	2004 Q1	Q2	Q3	Q4
<b>Energy Trend</b>										
Btu/ Pound of Product	5,044	4,272	4,844	4,071	<b>4,475</b>	<b>4,251</b>	4,772	4,772	4,772	4,772
Change <sup>1</sup>	-0.38%	-8.64%	0.58%	-2.45%	<b>-2.98%</b>	<b>-4%</b>	-5.39%	11.69%	-1.49%	-17.22%
Energy Use (MM Btu)	35,174	37,366	39,227	31,988	<b>37,366</b>	<b>136,546</b>	38,622	38,622	38,622	38,622
Change	7.34%	19.69%	20.39%	9.12%	<b>14.81%</b>		9.80%	3.36%	-1.54%	20.74%
Energy Cost	\$427,278	\$499,812	\$512,885	\$415,380	<b>\$1,854,355</b>	<b>\$1,733,822</b>	\$471,602	\$471,602	\$471,602	\$471,602
Change	9.64%	21.61%	18.57%	7.09%	<b>14.39%</b>		10.37%	-5.64%	-8.05%	13.53%
Energy Cost per MM Btu	\$12.15	\$13.38	\$13.07	\$12.99	<b>\$12.90</b>		\$12.21	\$12.21	\$12.21	\$12.21
<b>World Class Rating</b>										
World Class Energy Assessment Score <sup>2</sup>	90%	88%	91%	92%	<b>92%</b>	<b>85%</b>	92%	88%	75%	85%
<b>Projects</b>										
\$ Value of Energy Projects Secured & Delivered	\$6,990	\$165	\$165	\$165	\$7,485	<b>\$74,174</b>	\$12,729	\$12,729	\$12,729	\$12,729
\$ Value of Energy Projects Secured as a % of Plant Energy Spend <sup>3</sup>	1.6%	0.0%	0.0%	0.0%	0.4%	4%	2.7%	2.7%	2.7%	2.7%
\$ of Projects Identified, Being Evaluated & Planned	\$0	\$0	\$0	\$12,729	\$12,729		\$0	\$0	\$0	\$0

completed in 2006, delivering \$18.2 million in savings with energy use reduced by 2.9 percent from the previous year.

A key enabler in the implementation process is our Annual Energy Recognition Program, which was internally developed in 2003. We created this program to boost motivation and provide a sense of accomplishment, particularly when taking on challenges of this magnitude. Utilizing the 3M Energy Program Dashboard and EHS Scorecards, we issue awards to teams following a four-level rating, ranging from Bronze to Platinum. We recognize all winning teams through various levels of value, ranging from certificates to dinners with management.

The 3M Energy Program Dashboard considers energy per pound of product, total energy use, cost of energy, world-class energy assessment score, and value of energy projects implemented.

Results for each category are calculated on a quarterly basis. A goal for the next year is then determined and used to compare results. At the end of the year, each category's percent change and value-add is compared to the previous year determining their status rank.

Tier I facilities (the company's 59 largest energy users) are evaluated on the five criteria listed above. Based on a points system using the dashboard results, they are rewarded accordingly. Tier II locations are self-nominated, and the maximum award is Gold level. In 2009, three 3M U.S. plants and six international locations earned the Platinum award; 10 other facilities were classified as Gold award winners. Regardless of the award level achieved by our facilities, we strongly support and continue to encourage yearly improvement, providing plant energy teams certificates for strides made throughout the year.

Btu per Pound of Product Reduction	Plant Energy Program Effectiveness Rating	Projects Secured – % Delivered Compared To Plant Spend	Points	
4%	90%	4%	5	15 = Platinum 12 – 14 = Gold 9 – 11 = Silver 7 – 8 = Bronze
3 - 4%	85%	3 - 4%	4	
2 - 3%	80 - 85%	2 - 3%	3	
1 - -%	70 - 79%	1 - 2%	0	
0 - 1%	69% -	0 - 1%	0	

Recently, 3M successfully partnered with the U.S. Department of Energy Industrial Technologies Program's *Save Energy Now* LEADER initiative, which will assist with 200 additional energy-savings assessments of the most energy-extensive 3M plants in the United States. The LEADER program paves the way for 3M to work with diverse partners to create awareness and find energy-saving solutions. Through this campaign, 3M will disseminate energy savings information and tools to more than 200 plants to help reduce natural gas and electricity use. A few of the 3M plants participating include Brownwood, Texas; Nevada, Missouri; Decatur, Alabama; Guin, Alabama; and Austin Center, Texas.

Having previous partnerships with the Department of Energy, our access to outreach activities has been extended, the number of external resources available has increased, and the benefit of leading by example to reduce energy intensity and carbon emissions while enhancing competitiveness is invaluable.

### Investing in Cost-Effective Renewable Energy

Leveraging resources with our partners and continuing our commitment to energy efficiency allows further exploration and investment in cost-effective renewable energy. A 2,000-square-foot solar wall on the south side of the warehouse at 3M's Perth, Canada, plant has contributed in displacing 329 million Btu of electricity for the site each year and preheats the air, reducing the building transmission loss. 3M is also exploring opportunities to utilize landfill gas, on-site and off-site wind energy, and biodiesel at other 3M locations.

3M has been successful in reducing its energy use and is on track to exceed the present 20-percent efficiency improvement target. 3M has been recognized for its program by being awarded the ENERGY STAR sustained Excellence Award for Energy Management again in 2010, the company's sixth time and an industrial record.

*Ask the Energy Expert* is an ongoing column with the intent of providing information and solutions for industry's most pressing questions. This issue's Energy Expert is **Steve Schultz, Corporate Energy Manager at 3M.**

### Save Energy Now LEADER Saint-Gobain Delivers Webcast on Preparing for Project Implementation

Saint-Gobain—the world's largest manufacturer and distributor of building materials, and a leader in the production of high performance materials and glass containers—has joined the U.S. Department of Energy's Industrial Technologies Program (ITP) *Save Energy Now* LEADER initiative, signing a voluntary Pledge to reduce its industrial energy intensity by 25 percent over the next 10 years. As a LEADER, companies receive priority access to ITP's suite of technical resources as well as a number of other benefits, including participation in the *Save Energy Now* LEADER Web Conference Project Implementation Seminar Series, which consists of 12, one-hour Webcasts, which focus on real world examples and solutions.

On January 13, 2010, Brad Runda (Manager, Energy) of Saint-Gobain delivered a Webcast to fellow LEADER Companies, providing tips on how to properly prepare for project implementation before an energy assessment. Saint-Gobain has been an energy efficiency role model for others in the industrial sector, and has one of the best implementation programs. During the Webcast, Runda shared his knowledge, personal experience, and answered questions to assist other LEADER Companies achieve the same success Saint-Gobain has seen with energy efficiency project implementation.

*Ask the Energy Expert* will feature energy-reduction recommendations by Saint-Gobain in the Spring 2010 issue.

Learn more about Saint-Gobain at <http://www.saint-gobain.com/en>.

## International

The Industrial Technologies Program head of Energy Services Development, James Quinn, recently attended the **Energy Management Workshop** in Paris, organized by the IEA and the Institute of Energy Economics, Japan. The conference, connecting policy makers in energy management with energy management practitioners, lasted two days, and Mr. Quinn spoke on a roundtable panel about best practices in sharing information through brochures, Web sites, and other channels.

The Alliance to Save Energy is hosting its **Energy Efficiency Global Forum and Exposition** in Washington, D.C., May 10 through 12, 2010. Visit [Alliance to Save Energy's Web site](#) for more details.

The [2nd German American Energy Conference](#), March 22–23, 2010, will be hosted by the German Energy Agency and the German American Chambers of Commerce. Doug Kaempf will participate in a panel discussion. The aim of this conference is to facilitate the transatlantic relationship between Germany and the United States in the field of renewable energy.

## Funding Resources

The Office of Energy Efficiency and Renewable Energy (EERE) works with business, industry, universities, and others to increase the use of renewable energy and energy efficiency technologies. One way EERE encourages the growth of these technologies is by offering financial assistance opportunities for their development and demonstration.

Visit the **EERE Financial Opportunities Web site** at <http://www1.eere.energy.gov/financing/> to learn about the EERE funding and award process, types of EERE financial assistance, and how to apply.

The Industrial Technologies Program (ITP) is dynamic and offers many opportunities and activities for manufacturers who want to reduce their energy use and improve productivity. Competitive solicitations are the principal mechanism used by ITP to contract for cost-shared research and development. Solicitations reflect the priorities of the program and selection of projects follows merit-based criteria that emphasize projected energy, environmental, and economic benefits.

Visit the **ITP Solicitations page** at <http://www1.eere.energy.gov/industry/financial/solicitations.html> for active and future solicitations.

## Training Opportunities

### March 9, 2010

**Fundamentals of Compressed Air (Level 1).** This is a one-day introductory workshop in Omaha, Nebraska, designed to teach facility engineers, operators, and maintenance staff how to achieve 15- to 25-percent cost savings through more effective production and use of compressed air. Contact: Dennis Tribbie, 402-571-5004, [dtribbie@hughesmachinery.com](mailto:dtribbie@hughesmachinery.com).

### March 10–11, 2010

**Advanced Management of Compressed Air (Level 2).** This intensive two-day workshop in Omaha, Nebraska, will provide in-depth technical information on troubleshooting and making improvements to industrial compressed air systems. Contact: Dennis Tribbie, 402-571-5004, [dtribbie@hughesmachinery.com](mailto:dtribbie@hughesmachinery.com).

## Ongoing

***Fundamentals of Compressed Air Systems, Web Edition.*** The Compressed Air Challenge is pleased to announce the launch of the Fundamentals of Compressed Air Systems Web Edition. This Web-based version of the popular Fundamentals of Compressed Air Systems training uses an interactive format that enables the instructor to diagram examples, give pop quizzes, and answer students' questions in real time. Please visit the Compressed Air Challenge Web site, <http://www.compressedairchallenge.org/>, for Webinar dates and online registration.

*For more information on training opportunities offered by the Industrial Technologies Program, as well as a current calendar of available training sessions, please visit <http://www1.eere.energy.gov/industry/bestpractices/training.html>.*

Look for Us...

## ITP Calendar of Events

### March 2010

20–23: [Cast Expo '10](#)

7–9: [Globalcon 2010](#)

### April 2010

14–16: [Fluid Sealing Association 2010 Spring Meeting](#)

27: [Environmental Markets Association Environmental Markets Summit](#)

### May 2010

1–5: [2010 Manufacturing Extension Partnership National Conference](#)

10–12: [2010 Energy Efficiency Global Forum & Exposition](#)

11–12: [Action for a Sustainable America Sustainable Manufacturing Summit](#)

17–19: [Annual Steel Manufacturers Association Members Conference](#)

19–23: [Industrial Energy Technology Conference 2010](#)

25–27: [National Environmental Partnership Summit](#)

## Industrial Technologies Program Contacts

*Click below to request more information about ITP and the services we provide.*

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The quarterly newsletter of the U.S. Department of Energy's Industrial Technologies Program has been redesigned and expanded to include industry-related legislation and market trends, articles from industry experts, and other information of interest to our partners. *Energy Matters* is for industry professionals like you. **Subscribe today—it's free!**

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