THE OIT TIMES

"Turning Industry Visions into Reality"

Vol. 4, No. 3

SUMMER 2001

OIT's ROI: $6.5 billion and rising

As of 1999, OIT-sponsored technologies had saved 1.6 quads of energy and reduced CO_2 emissions by 121 million tons—but that's only the beginning

The Office of Industrial Technologies recent Expo was, in part, a celebration of the successes that OIT and its partners have achieved in their shared drive to cut energy use, reduce emissions and waste and, overall, enhance the competitiveness of America s manufacturing industries. By nearly any measure, those successes have been impressive indeed.

According to figures published in OIT s recent report *Impacts Summar y of Program Results,* the cumulative energy savings of more than 140 completed and tracked OIT projects and other programs is approximately 1.6 quadrillion Btu, representing a production cost savings of $6.5 billion. This is after the initial investments made by both government and industry are subtracted out. (You can download *Impacts* from www.pnl.gov/impacts).

In addition to energy savings, the environmental benefits of these technologies are also considerable. According to *Impacts,* the joint efforts of OIT and its partners have also kept 121 million tons of CO_2, 246,000 tons of NOx, 463,000 tons of SOx and 124,000 tons of particulates out of the air.

Productivity benefits surpass energy savings

And, the data don t include the productivity improvements and waste minimization benefits gained from the implementation of OIT-sponsored technologies. Estimates suggest that, in dollar terms, these benefits could represent savings as much as *three times greater* than the energy savings.

These quantifiable benefits are large and sometimes difficult to grasp, but, says DOE s Deputy Assistant Secretary for Industrial Technologies Denise Swink, they all add up to one thing. Superior technologies mean ener gy savings, higher productivity and a better bottom line for any manufacturer, she said.

OIT focuses on energy-intensive, resource-based manufacturing industries whose importance to the American economy is often overlooked. But, said Swink, The nine energy-intensive Industries of the Future employ more than three million people at all educational levels, from semi-skilled workers to PhDs. They form the foundation for our economy, with each job in manufacturing on average generating four additional jobs in the service sector.

At the same time, these basic industries face a number of common challenges, especially, says Swink, a shortage of R&D focused on pre-competitive process technologies that can benefit wide segments of entire industries—the very type OIT and its partners target.

Got a Question?
Call 1-800-862-2086

OIT s innovative way of doing business brings companies together to work on pre-competitive technologies that can benefit their overall industry. Its Industries of the Future strategy begins with each industry reaching consensus on where it wants to be by 2020 and what technologies it needs to get there. OIT then cost-shares R&D teams to address the identified challenges.

Expected savings from current portfolio

And, while the results—as noted above—have been impressive, looking at OIT s current portfolio of technologies suggests that

(continued on page 8)

INSIDE

Agriculture

Inaugural bio-based polymer facility opens

Cargill Dow LLC will start up the world s first large scale Polylactic Acid (PLA) manufacturing plant in Blair, NE later this year. PLA is a new biodegradable plastic that s derived from corn and replaces nonrenewable fossil raw materials. This culminates years of R&D by Cargill and others whose efforts were supported by the **Agriculture** Team, as well as other parts of DOE and other Federal agencies. The PLA market could eventually exceed 8 billion lb/year—saving 190 trillion Btu of energy. PLA represents one of the single largest impacts we have in the **Agriculture** Team on energy savings, said Team Leader Mark Paster (202-586-2821).

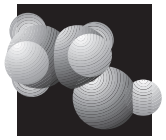
Mark Paster, Agriculture Team Leader

Succinic acid is another plant-based raw material that could compete with fossil fuel-derived feedstocks used to manufacture paints, plastics and other products. High production cost has kept succinic acid from being widely used. But we ve had incremental successes in this area for several years and two recent R&D projects have forwarded technology to the point where succinic acid is financially attractive, said Paster. He expects commercial-scale production of lower cost succinic acid to soon begin.

A Clean Fractionation project co-supported by OIT s **Agriculture** and **Chemical** Teams is being scaled up to pilot stage. The technology enables manufacture of high purity cellulose using significantly less energy than incumbent processes. Projected potential energy savings are 13 trillion Btu/year by 2020.

Chemicals

Turning waste carpeting into commercial raw materials



The **Chemicals** Team is proud of its pipeline of successful projects moving toward commercialization, said Team Leader Paul Scheihing (202-586-7234). One commercial success is the Nylon 6 Recycling project, which recently earned both the Society of Plastic Engineers Recycler of the Year, and The Design for Humanity Award. Honeywell and DSM Chemicals use the technology at their Evergreen Nylon Recycling plant in Augusta, GA the lar gest commercial-scale nylon recycling plant in the world. The plant can convert waste carpeting back to virgin-quality monomers keeping an estimated 200 million pounds of carpet out of landfills, annually, and saving 4.4 trillion Btu.

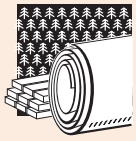
Paul Scheihing, Chemicals Team Leader

About to enter the pilot stage is another Team-sponsored technology, Catalytic Hydrogenation Retrofit Reactor. It improves the commonly-used hydrogenation process by replacing a slurry catalyst system with a monolith catalyst reactor. The new process uses less energy and reduces environmental and safety concerns of the incumbent method.

The Team is also supporting the Multi-Phase Fluid Dynamics Research Consortium which brings together the country s leading chemical companies, engineering universities and DOE Labs in an unprecedented partnership. The group is developing new techniques that will lead to better understanding of gas-solid flow. This will lead to improved chemical process yields and provide very large energy savings due to the widespread prevalence of gas-solid flow in the chemical industry.

Forest Products

Burning sludge without NOx emissions



Forest Products Team Leader Valri Robinson (202-586-0937) identified three especially promising technologies recently supported by the Team that are now being demonstrated at partner facilities. Perhaps the most successful is the Methane de-NOx Reburning Process being demonstrated at a Boise Cascade (BC) plant, she said. Natural gas is injected into the combustion zone to create an oxygen-deficient environment that reduces NOx formation. Mills are interested because it could allow disposal of sludge by burning rather than landfilling without increasing emissions. BC reports they can burn 400% more sludge than before, while maintaining NOx levels. Other benefits include a reduction in overall gas use and an increase in boiler efficiency, saving nearly $700,000/year on equipment that costs just $400,000 to install.

In another demonstration at a Visy Paper facility in Georgia, mechanical rather than chemical means are employed to detackify stickies that lead to excessive costs and downtime for recycling mills. The new process reduces the cost of chemicals and their environmental impacts, and could save more than 1 billion kWh/year.

Another successful technology, On-line Fluidics Controlled Headbox, is being demonstrated at a Smurfit-Stone mill in Florence, SC. It allows a mill to process 10-15% less fiber per sheet which could save up to 60 trillion Btu/year by 2020.

Aluminum
Revolutionizing the way aluminum is made

The **Aluminum** Team is partnering with Northwest Aluminum Co. on a project that will change the way aluminum is made and could reduce the energy required for smelting by 25-30%. The process uses a new cell design with a non-consumable inert metal anode to produce aluminum. It has lower energy intensity, lower cost and lower environmental impacts than the traditional Hall — Heroult technology.

Sara Dillich, Aluminum Team Leader

Another team project, led by Secat, Inc., addresses the oxidative melt problem that accounts for a loss of up to 4% of secondary aluminum during the melting process. This project is a model partnership, bringing together representatives from industry, universities and DOE Labs, said Aluminum Team Leader Sara Dillich (202-586-7925). It will help solve a long-standing plant floor problem while enhancing our understanding of the oxidation process. Best of all, it will reduce energy losses by up to 50%.

In a partnership with DOE s Office of Transportation Technologies and the auto and aluminum industries, the Team is championing an Automotive Aluminum Scrap Sorting technology that will likely achieve fast commercialization. Using laser induced spectroscopy, the new process will allow rapid separation of cast and wrought aluminum and aluminum alloys, thereby facilitating the use of recycled rather than primary metal.

Steel
New electronic technologies saving energy in demanding steel environments

A **Steel** Team project is developing a model to better control pre-heated air in blast furnaces. The model will allow tighter control over temperature and flow rates thereby reducing fuel use. Overcoming a number of obstacles, the project partners began using the model on a blast furnace at Inland Steel where natural gas use was subsequently cut by about 7%. The model is now being used on all three of the mill s blast furnaces.

Isaac Chan, Steel Team Leader

An electric arc furnace optical sensor developed in a Team partnership was recently proven successful in a prototype trial at The Timken Company s Faircrest Steel Plant in Canton, OH. The laser-based system measures the composition of gases exiting a steel-melting furnace, facilitating real-time process control. Timken projects a 10% improvement in productivity and a 2% increase in energy efficiency. An extended trial is now underway.

A third project is helping more accurately control the properties of hot rolled steel, yielding a more refined product with less variability. In use at several AISI-member mills, the hot strip mill model runs on a PC, and has shown the ability to reliably correlate operating parameters to resulting properties of hot rolled steel.

These three successes provide a broad spectrum of value to the steel industry, said OIT s new Steel Team Leader Isaac Chan (202-586-4981). They help save energy in an integrated steel mill, in electric arc steelmaking, and downstream in the rolling area.

Metal Casting
Doubling of steel die lifetimes sought

The **Metal Casting** Team s R&D portfolio has been making important contributions to industry-identified roadmap priorities and OIT s energy efficiency goals, said Team Leader Harvey Wong (202-586-9235). One project led by The Materials Technology Laboratory is helping industry to better understand copper alloys. It has created the first-ever comprehensive database on these materials, and details the mechanical, fracture toughness, impact, and fatigue properties of 13 copper alloys. Use of this information is expected to contribute to processing efficiencies saving 1.2 trillion Btu and reducing CO_2 emissions by 120,000 tons.

Led by the Univ. Alabama/Birmingham, Lost Foam Casting, is improving process controls for this casting method. It offers significant cost and environmental advantages, and enables metal casters to produce complex parts that are often not possible using other methods. Compared to traditional green sand or resin-bonded sand molding methods, potential energy savings of lost foam amount to about 27% (4.7 trillion Btu/year by 2020) with a 46% improvement in labor productivity. The Team s work has made lost foam a practical reality, and its use is increasing by as much as 20% per year.

Steel dies can take months to manufacture and cost over $1 million. Moreover, die testing and manufacturing can be energy intensive. A team led by Case Western Reserve Univ. is identifying composition and processing techniques that lead to improved thermal fatigue resistance, increased die life and reduced die cost. Die life improvements of 50-100% have been seen, resulting in considerable energy savings.

Glass
Low-NOx burner to be demonstrated

The **Glass** Team is sponsoring a high luminosity, low-NOx burner for use in oxy-fuel fired glass furnaces—the state-of-the-art technology for efficient glass melting. The burner, developed by GTI, significantly increases thermal efficiency and reduces NOx emissions. Field-testing is planned for an Owens Corning plant later this year.

In another project, an electrostatic batch preheater system uses waste heat exhausted from glass furnaces to preheat raw materials. A full-scale demonstration of the system, developed by BOC Gases, is planned within the year. The technology could potentially save more than six trillion Btu/year by 2020.

Modeling is a key technology priority of the industry. The better understanding we have of glass furnace operations and glass properties at high temperatures, the more effective we can be in reducing energy use and increasing manufacturing efficiencies, said Team Leader Elliott Levine (202-586-1476). Argonne National Lab, Sandia National Labs, and the Center for Glass Research are leading Team projects in several areas of process modeling. For example:

- a combustion space/glass melt model will help improve furnace design and operation for increased efficiency;
- refractory corrosion models are being developed to extend furnace lifetimes; and
- high-temperature melt properties are being studied to enable modeling of glass melting and forming processes.

Petroleum Refining
Waste gas to be chilled, captured as LPG

An R&D project sponsored by the **Petroleum** Team will soon be improving refinery efficiencies by recovering waste gases that are currently flared. The new technology uses a waste heat-powered ammonia absorption refrigeration unit to chill and condense the gases, capturing them as liquified petroleum gas (LPG). In its demonstration at the 27,000 barrel/day Ultramar Diamond Shamrock refinery in Denver, the technology showed the capability to recover 2.1 million gallons of LPG and gasoline per year reducing CO_2 emissions by 10,000 tons. Offering quick payback, the project was selected as Environmental Project of the Year by the Association of Energy Engineers. Now commercially available, this technology can almost immediately save energy, reduce emissions and boost profits at nearly any refinery in the country, said Team Leader Jim Quinn (202-586-5725).

Jim Quinn, Petroleum Team Leader

The hydrocarbon leak detector, another team project, offers refineries a faster, easier, cheaper way to identify vapor leaks using gas imaging technology. Inspections can now be readily performed more frequently, reclaiming lost resources and minimizing fugitive emissions. The technology will be displayed at OIT s Salt Lake City Showcase in August (see page 8), and installed in a refinery for testing in the fall.

Low NOx burner technologies are a high priority for the industry. Early testing suggests that the Team s rotary burner technology can reduce NOx emissions to less than 10 ppm. The technology will be installed in a commercial heater and demonstrated in a refinery later in 2001.

Mining
Real-time data on equipment status coming

The **Mining** Team s revolutionary Development and Deployment of Automated Machine Fluid Analysis Systems (or Oil Pro) allows automatic, real-time analysis of all equipment fluids. Users won t have to take equipment out of service to analyze fluids anymore, said acting Team Leader Mike Canty (202-586-8119). W ithin five years, the deployment of on-board fluid diagnostics will save industry $7.5 million, which is roughly equivalent to 3.75 million quarts of synthetic lubricant.

The Team also anticipates good success in reducing energy use in grinding mill operations with newly developed process optimization software. An early version of the software was successful, and a 3-D version promises to reduce energy use 30%.

A third Team project is tackling problems associated with underground diesel-fueled equipment by developing hydrogen-storage technology that will enable a new generation of fuel cell-powered vehicles. Clean fuel cells eliminate diesel exhaust, and, by replacing diesel fuel, could save 1.7 trillion Btu/year by 2020. This is a very exciting project. I m really looking forward to seeing it run for the first time at our prototype testing, said Canty.

Best Practices

Helping plants cut energy and costs quickly

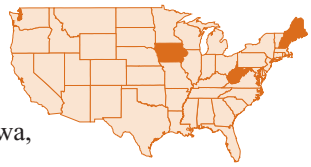
Among the many valuable services offered by the **Best Practices** Team are plant-wide energy assessments, which include comprehensive analysis of major plant energy-supply systems such as furnaces, boilers, motors, fans, pumps and compressed air. A recent assessment performed with the **Metal Casting** Team at AMCAST Industrial Corp s Wapakoneta, OH plant identified several areas for energy savings. One of an ongoing series aimed at cutting national energy use in industry, the assessment results will be widely distributed as a case study of how foundries can cut energy use. Team Leader Theo Johnson (202-586-6937) explained, Because the investment required to implement most of the findings from the assessment is relatively modest, quick paybacks are expected.

Another Team outreach feature is the Allied Partner initiative. Allied Partners are companies and organizations that provide equipment and services to industry and, with OIT assistance, disseminate Best Practices software and other tools to their customers. Allied Partners gain a competitive edge and their customers reduce energy use and save money. The multiplier effect allows us to leverage our limited resources and helps firms save millions of dollars on energy, noted Johnson. Allied Partners include the American Institute of Chemical Engineers, the Air Movement & Control Assoc., the Compressor Distributors Assoc., the Industrial Heating Equipment Assoc., and more than 225 others.

Best Practices T rain the Trainer initiative is an offshoot of the Allied Partner program. This effort trains members in the use of software tools such as OIT s Pumping System Assessment Tool (PSAT), allowing them to train their customers and, again, multiplying the use and cost-savings realized by these tools.

States

Three more Governors sign-up to partner with DOE/OIT



Within the space of a week, OIT s **States** Team recently signed separate Memoranda of Understanding with the Governors of Iowa, New Hampshire, and Maine. Iowa s Governor Tom Vilsack formally acknowledged start-up of an Iowa IOF program with a ceremony in his office on April 19. The Iowa program will accelerate R&D partnerships in the State, particularly in Iowa s **Agriculture** and **Metal Casting** industries. On the 23rd, Maine Governor Angus King signed on behalf of his state, with Governor Jeanne Shaheen of New Hampshire pledging support for the program in her state the next day. I think it s very meaningful that we brought three new states on board bang, bang, bang and that we received commitment at the highest level of State government in all three cases, said Team Leader Sandy Glatt (202-586-3897). It shows that there s growing awareness of the States IOF Program and a broader recognition of the value of the program to a state s economy. We re very pleased.

Sandy Glatt, States Team Leader

Glatt notes that the program is continuing to grow, and she expects at least 6 or 7 new states to begin or accelerate States IOF efforts over the next 12 months.

West Virginia—the first state to sign a States IOF agreement and an ongoing model for States IOF success—is planning its MOU signing in December. To date, local efforts have secured more than $13 million in R&D funding to help West Virginia industries cut energy use and increase productivity.

Enabling Technologies

New burner cuts NOx while improving boiler efficiency

Demonstrating 9 ppm NOx performance, the **Combustion** program s Forced Internal Recirculation (FIR) burner is a revolutionary advance in burner technology. T ypically, low emission burners sacrifice efficiency, but this burner provides *increased* heat transfer efficiency in boiler applications, said program manager Bob Gemmer (202-586-5885). The burner is applicable to a wide range of boilers, and near-term commercialization is expected.

The **Industrial Materials of the Future** program has helped solve a major problem long plaguing the paper industry, according to program manager Charlie Sorrell (202-586-1514). Composite tubes have had a high failure rate in Kraft recovery boilers, sometimes leading to explosions, he said. OIT sponsored a project to determine the cause and develop a set of new operating procedures and materials suggestions. Several companies have already adopted these insights and solved the problem, he said.

The **Sensors & Controls** program in partnership with the **Steel** Team is demonstrating laser ultrasonics technology at a Timken steel plant. Laser pulses instantly determine steel tube wall thickness and other parameters, allowing real-time adjustments and saving a large chunk of the $234 million in waste attributed to inadequate process controls. A separate Timken effort is using laser ultrasonics to measure grain size. These are pioneering applications demonstrating the vast potential of laser ultrasonics in an industrial setting, said program manager Gideon Varga (202-586-0082).

OIT's Emerging Technologies*

Agriculture
- Anaerobic Pump
- Sensor System to Monitor Gaseous Nitrogen Transfer
- Soy-Based 2-Cycle Engine Oils

Aluminum
- Aluminum Salt Cake: Electrodialysis Processing of Brine
- Brazing and Spot Welding for Joining Al Alloys in Vehicle Manufacturing
- Converting SPL to Products
- Improved Grain-Refinement Process
- Microsmooth Process on Aluminum Wheels
- Molten Aluminum Explosion Prevention
- Novel Technique for Increasing Corrosion Resistance of Aluminum and Al Alloys
- Vertical Flotation Melter

Chemicals
- Advanced Catalytic Hydrogenation Retrofit Reactor
- Advanced Electrodeionization Technology
- Advanced Sorbents for Gas Separation
- Alloys for Ethylene Production
- Biofine Technology
- Life Cycle Cost Accounting Tool
- Chlorosilane Recovery from Silicone Production
- Novel Membrane-Based Process for Producing Lactate Esters
- Olefin Recovery from Chemical Waste Streams
- Pressure Swing Adsorption for Product Recovery
- Separation and Recovery of Thermo Plastics for Reuse via Froth Flotation

Forest Products
- Acoustic Humidity Sensor
- Acoustic Separation Technology
- Christian Veneer Dryer
- Improved Composite Tubes for Kraft Recovery Boilers
- KTM Logger
- Linear Corrugating
- Low-Emission Drying of Lumber and Wood Panel Products
- Lumber-Defect Detection System
- Mechanical Alternatives to Chemicals in Recycle Mills
- Methane De-NOx® Reburn Process
- Molten-Film High-Intensity Paper Dryer
- Online Fluidics Controlled Headbox
- Online Paper Sensors
- Steam Reforming Black Liquor Gasification

Glass
- Advanced Low-E Coatings
- Electrostatic Batch Preheater System
- Energy Efficient, Electric Rotary Furnace for Glass Molding of Precision Optical Blanks
- Glass Fiber Manufacturing
- High Luminosity, Low-NOx Burner
- Integrated Batch and Cullet Preheat for Glass Furnaces
- Phase/Doppler Laser Light-Scattering System
- SingleChip Color Sensor

Metal Casting
- Clean Cast Steel
- Highly Efficient Rapid Tooling Using Optimized Cooling Passages
- Intelligent Control of the Cupola Furnace
- Lost Foam Casting Technology
- Three-Dimensional Objects by Photosolidification

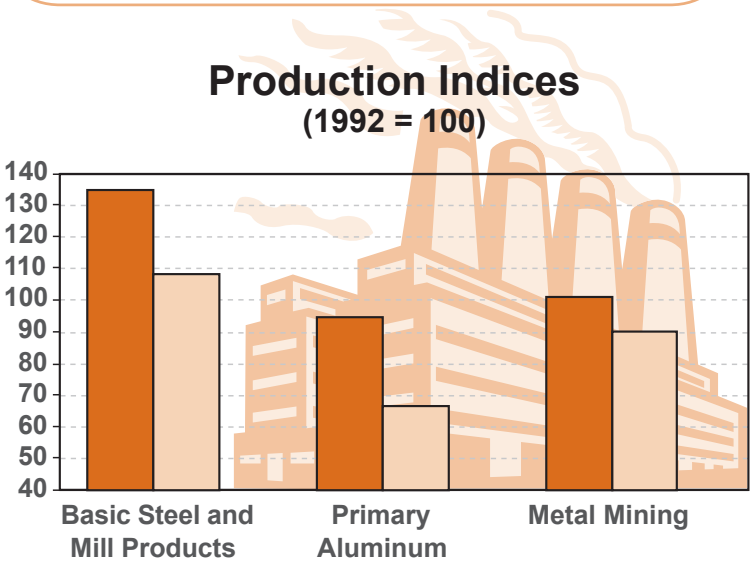
Mining
- Grinding-Mill Optimization Software
- Imaging Ahead of Mining

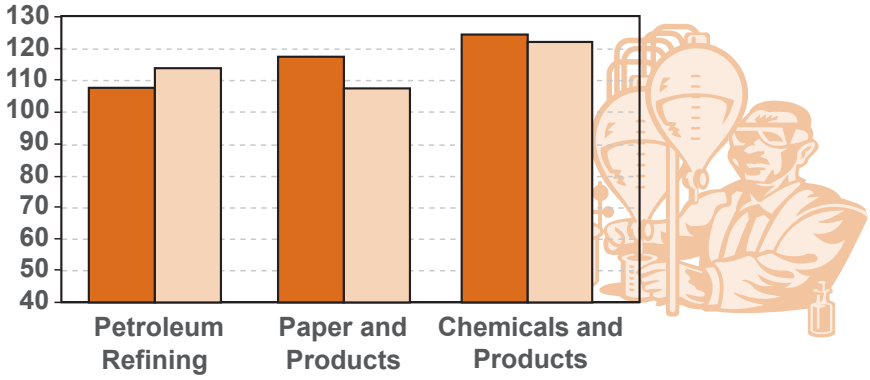
Petroleum
- Advanced Fluid Catalytic Cracker (FCC) Model
- Advanced Membrane Devices for Natural Gas Cleaning
- Catalytic Cracking Demonstration Plant
- Low-Cost Robust Ceramic Membranes for Natural Gas Upgrading
- Petroleum Fouling Mitigation

Steel
- Development of Cost-Effective Energy-Efficient Steel Framing
- Electrochemical Dezincing of Steel Scrap
- Hot Oxygen Injection into the Blast Furnace
- Improved Surface Quality of Exposed Automotive Sheet Steels
- Intelligent Systems for Induction Hardening
- Laser-Assisted Arc Welding
- Lightweight Steel Containers
- Magnetic Gate System for Molten Metal Flow Control
- Method of Making Steel Strapping and Strip
- Nickel Aluminide Radiant Heater
- On-Line Non-Destructive Mechanical Properties Measurement
- Optical Sensor for Post-Combustion Control in EAF Steelmaking
- Phase Measurement of Galvanneal
- Plant Trial of Non-Chromium Passivation Techniques for Electrolytic Tin Plate
- Processing Electric Arc Furnace Dust into Salable Chemical Products

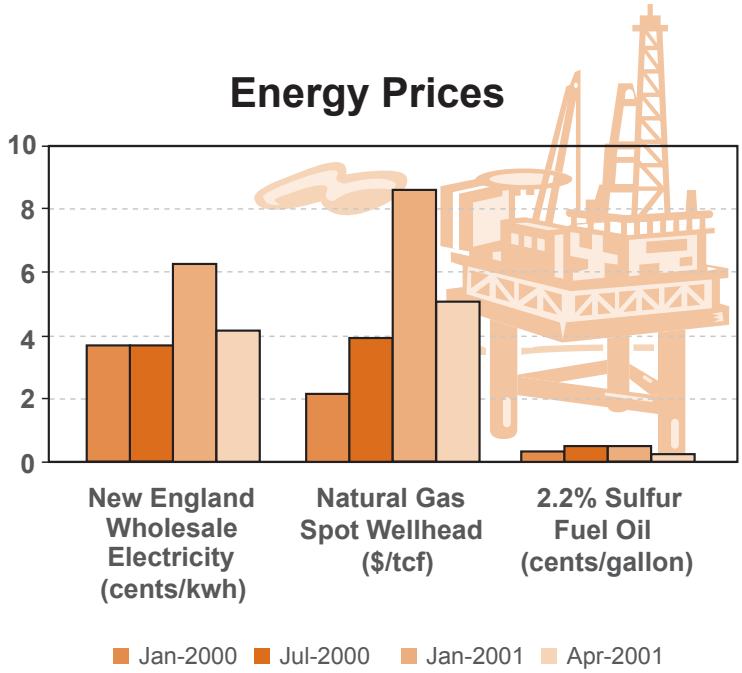
***Emerging technologies** are those supported by OIT that are likely to be commercialized within the next year or two. Some of these technologies have already yielded scientific information that has improved current industrial processes. To view descriptions of these and other emerging technologies, visit www.pnl.gov/impactsapp2.pdf or call 1-800-862-2086.

Industry Trends





Source: Federal Reserve Board



Sources: Electricity - New England ISO; Natural Gas - Natural Gas Week; Fuel Oil - Oil Market Intelligence

Guest Editorial

Measuring the benefits of OIT investments

by Ken Friedman
Director, OIT Metrics and Analytics

This issue of *The OIT Times* provides ample anecdotal and statistical evidence about the benefits of OIT partnerships to improve industrial energy efficiency. I d like to give you some background about how and why OIT collects this information.

We ve tracked the benefits of OIT-supported technologies for over 20 years. We conduct phone surveys with suppliers and users of these technologies to get data measuring the energy and environmental impact of over 140 OIT-supported commercial technologies. In 1999 alone, these technologies saved more than 185 trillion Btu (worth over $1.1 billion in 2000 energy prices). Moreover, industry has further benefitted from productivity improvements, reduced resource use, decreased emissions, and improved product quality that are associated with these technology advances. Descriptions of OIT-supported commercial technologies and their quantifiable benefits are provided in our recent report titled *Impacts Summar y of Program Results* (visit www.pnl.gov/impacts).

Another driver is the Government Performance and Results Act of 1993 (GPRA) which is having a profound impact on the accountability of Federal agencies. It requires us to formulate strategic plans, set yearly goals and targets, and measure and report on how well we re doing in achieving our goals. The law was intended to enable the public and policymakers to see how well government is doing, stop things that don t work, and encourage continuous improvement in things worth investing in. Our GPRA metrics project the future benefits of our programs based on forecast market penetration of OIT-supported emerging technologies. We re committed to developing measures of program performance that are relevant to our industry partners and to using these metrics in making program and project decisions.

THE OIT TIMES
"Turning Industry Visions into Reality"

Office of Industrial Technologies, EE-20
Energy Efficiency and Renewable Energy
U.S. Department of Energy
Washington, DC 20585
www.oit.doe.gov

ISSN 1526-2804

Deputy Assistant Secretary for
Industrial Technologies,
Denise Swink

Managing Editor,
Lou Sousa

Reporters,
Gregg Siegel, Beth Walbert

Designer,
Allen Austin

Content reprintable without permission.
Correspondence, including requests for additional copies, or to be added to or deleted from the mailing list, may be directed to:

Lou Sousa
Fax: (202) 586-9234
E-mail: lou.sousa@ee.doe.gov

DOE/GO-102001-1368

Bulk Rate
U.S. Postage
PAID
Permit No. 258
Golden, Colorado

OIT's ROI *(continued from page 1)*

historical successes might well be dwarfed by future ones. OIT s present portfolio includes 120 projects scheduled to be commercialized within two years (see list on page 6), and about 400 more with slightly longer horizons. By 2010, energy savings flowing from technologies developed in OIT-sponsored partnerships are projected to reach more than one quadrillion Btu *per year*—valued at over $5 billion at current energy prices. By 2020, energy savings are projected to reach 4.1 quads per year, or nearly 10% of the total energy now used by industry.

In this issue of *The OIT Times*, OIT s Team Leaders discuss some of the recent and emerging technology successes stemming from our work. We describe technologies that will likely contribute to this enormous reduction in energy demand.

W e re very proud of our historical contributions to America s industries, said Swink. But, in looking at what our Team Leaders have to say, I think it s apparent that, for OIT and its partners and for U.S. industry in general the best is yet to come.

Salt Lake City to "showcase" mining, petroleum, aluminum technologies and best practices

OIT and the State of Utah will host the Utah 2001 Industry Showcase from August 27-29, 2001 at the Sheraton City Centre in Salt Lake City. The showcase will exhibit best practices and several advanced, energy efficient technologies from three of the nine most energy intensive industries: petroleum, mining, and aluminum.

The Utah 2001 Showcase will feature plant tours, breakout sessions, over 40 exhibits, and a congressional forum which will include local members of Congress and industry CEOs. The State of Utah will also sign a Memorandum of Understanding partnership with OIT at the event. Plant tours will include: Alcoa - Spanish Fork, UT (aluminum), MagCorp - Rowley Junction, UT (mining), Kennecott - Copperton, UT (mining), Flying J refinery North Salt Lake, UT (petroleum), Silver Eagle - Woods Cross, UT (petroleum), Chevron - Salt Lake City, UT (petroleum).

For information, call 1-800-862-2086 or visit www.doe.oit.gov/news/05_18_01_slc.shtm.