



ITP's Energy Solutions for the Chemical Industry

Council on Chemicals Research

April 19, 2010

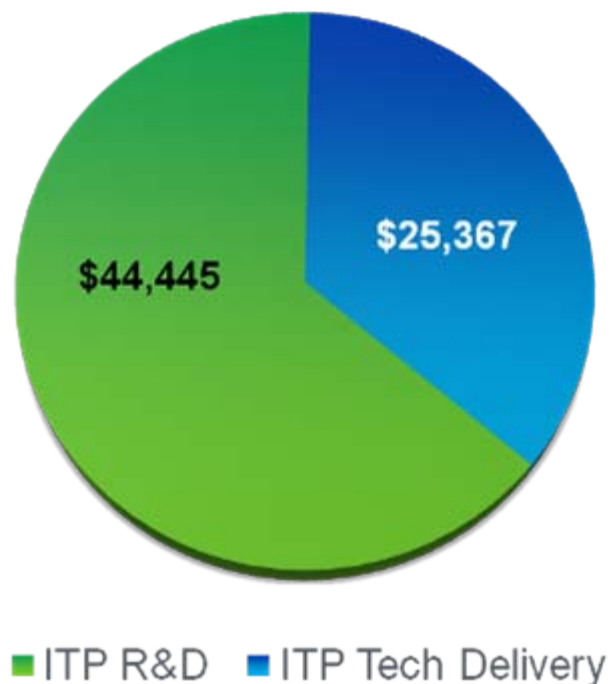
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Program Manager

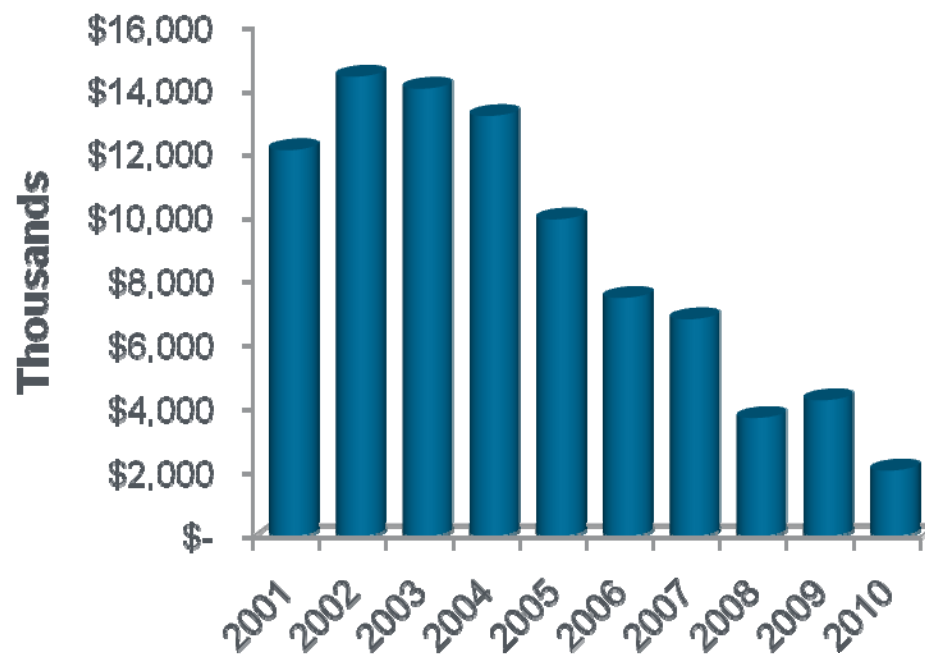
Industrial Technologies Program

U.S. Department of Energy

2006-2010 Average Funding by Area, in thousands



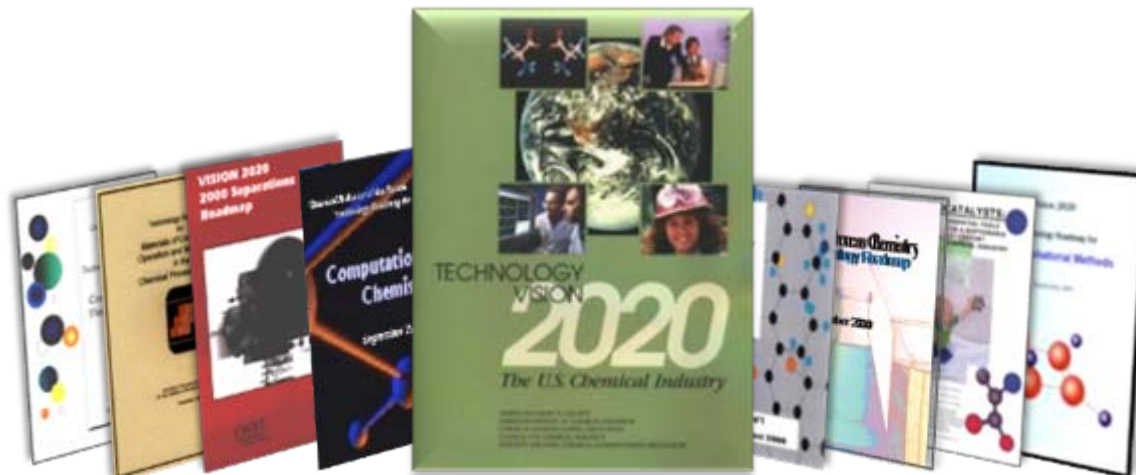
Chemical R&D Funding Levels



ITP's Current Budget, in thousands

| Industrial Technologies Program | 2010 | 2011 (Request) |
|---|-----------------|-----------------------|
| Industries of the Future (Specific) | \$12,121 | \$2,627 |
| Forest & Paper Products Industry | 1,390 | 0 |
| Steel Industry | 4,205 | 0 |
| Aluminum Industry | 1,796 | 0 |
| Chemicals Industry | 4,407 | 2,070 |
| Cement Industry | 0 | 487 |
| SBIR/STTR | 323 | 70 |
| Industries of the Future (Crosscutting) | \$53,005 | \$55,213 |
| Industrial Materials for the Future | 4,468 | 4,167 |
| Energy-Intensive Process R&D | 14,252 | 14,847 |
| Fuel & Feedstock Flexibility | 3,633 | 3,786 |
| Nanomanufacturing/Interagency Mfg. R&D | 4,543 | 4,732 |
| Industrial Distributed Energy [CHP] | 24,698 | 25,727 |
| Desalination | 0 | 488 |
| SBIR/STTR | 1,411 | 1,466 |
| Industrial Technical Assistance | \$30,874 | \$32,160 |
| Industrial Assessment Centers | 3,874 | 4,035 |
| Best Practices | 27,000 | 28,125 |
| Manufacturing Energy Systems | 0 | \$10,000 |
| Total | \$96,000 | \$100,000 |

- Vision2020 is an industry-led, public and private-sector partnership that seeks to expand chemical R&D
- Most of ITP's chemical R&D has followed Vision2020's roadmap recommendations. Key research areas include: separations, reactions, nanomaterials, ionic liquids, and new processes
- ITP chemical R&D technologies have saved 5.87 trillion Btus (plus an additional 54 TBtus for crosscutting technologies)



Save **ENERGY** Now

118 assessments conducted for the chemical industry (2006-2010)

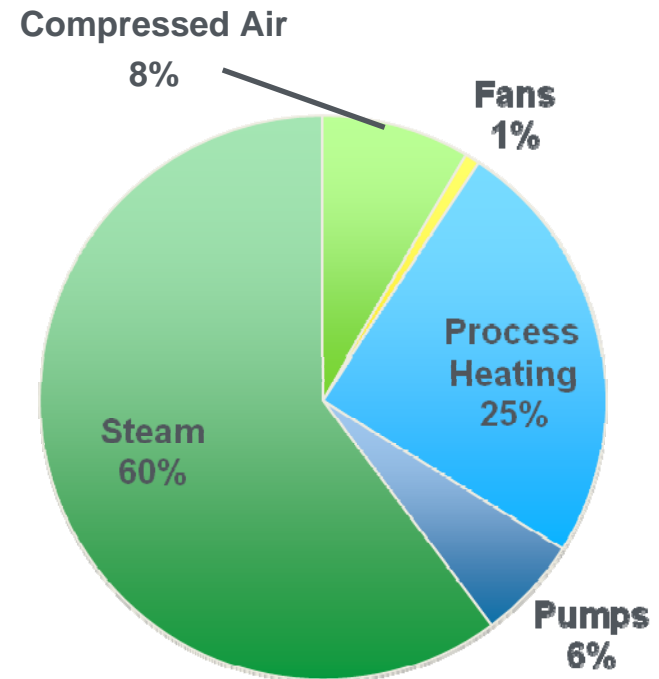
20% of all assessments have been for chemical companies

9% in energy savings identified

Represents potential cost savings of 9%

17% of all recommendations were implemented*

Chemical Industry
Assessments By System Type



Chemical Companies that Received Assessments from ITP

| | | | | |
|-----------------------------------|------------------------------|---------------------------------|--------------------------|-------------------------|
| 3M | Dakota Gasification Company | Honeywell Specialty Metals | PMC Biogenix | Sunoco |
| Afton Chemical Corporation | Degussa Corporation | Huntsman | PPG Industries | Terra Nitrogen |
| Air Products | Dow Chemical | Innovene | PQ Corporation | Texas Petrochemicals LP |
| Albemarle Corporation | Dow Corning Corporation | J.R. Simplot | Praxair, Inc. | Tronox |
| BASF | DuPont | JM Huber | REC Silicon Butte Plant | Union Carbide |
| Bayer Baytown Industrial Park | Dyno Nobel Inc. | Lubrizol Corporation | Renew Energy, LLC | UOP LLC |
| Bayer CropScience | Eastman Kodak Company | Lyondell Chemical Company | Rentech Energy Midwest | Vertellus Plant |
| Celanese Acetate | Eka Chemicals Inc. | Millennium Inorganic Chemicals | Rohm and Haas | W.R. Grace |
| CF Industries, Inc. | Ferro Corporation | Momentive Performance Materials | Rubicon LLC | Xerox Corporation |
| Chemtura | FMC Corporation | Monsanto | Sanofi Pasteur | |
| Chevron Phillips Chemical Company | Formosa Plastics Corporation | Mosaic Company | Sherwin-Williams | |
| Commonwealth Agri-Energy | Global Ethanol | OMNOVA | Solvay Chemicals Inc | |
| Cytec Fortier | Hercules Incorporated | Oxea (formerly Celanese) | Sterling Chemicals, Inc. | |

Case Study: Dow Chemical Hahnville, LA



- At some chemical plants, steam can account for the most end-use energy consumption
 - Dow had been aware of efficiency problems in its steam system, so they brought in a DOE energy expert to perform a specific assessment
 - The expert's work helped quantify savings and gave management a compelling case to improve its steam system
- Dow repaired leaky and failed steam traps
 - Efficiency improvements had a return in about 6 weeks
 - The plant saved \$1.9 mil. annually and 272,000 MMBtus of natural gas

Dow Chemical's plant in Hahnville, LA



ITP Web Site: <http://www1.eere.energy.gov/industry>

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