expertise to the renewable energy community. ITP coordinates with all EERE business functions to create a more efficient and accountable management process. The Golden Field Office has lead responsibility for managing ITP projects and industry procurements, allowing ITP to focus on developing and managing its technology portfolio. The DOE Regional Offices provide a network of capabilities throughout the country to implement ITP's technology delivery strategy.

People represent EERE's most valuable asset. By investing in human capital, ITP provides the expertise to effectively and efficiently accomplish its mission and implement its program. ITP will work with EERE to ensure that its human resources are adequate for the type and magnitude of program activities it conducts and are consistent with the needs and expectations of responsible program management.

ITP coordinates its activities with a variety of government programs that have mutual interests and goals. For example, ITP works with DOE's Basic Energy Sciences and Fossil Energy programs to coordinate research in areas such as nanotechnology and mining, respectively. In addition, ITP coordinates with other Federal agencies including the National Aeronautics and Space Administration (NASA), the National Science Foundation (NSF), the National Institute of Standards and Technology (NIST), the Environmental Protection Agency (EPA) and the Departments of Defense (DoD), Commerce (DOC), Agriculture (USDA), and Interior (DOI). On manufacturing technology issues, ITP collaborates through the GATE-M partnership with many of the participating agencies.

Operating Principles

- Provide strategic leadership (Program Management) from EERE headquarters and rely on field Project Managers to oversee individual projects.
- Seek opportunities to work with all other EERE programs to collectively contribute to the success of the entire EERE team.
- Capitalize on the capabilities of the EERE Regional Offices to perform technology and information dissemination.
- Serve as good stewards of the public resources appropriated to carry out the mission.

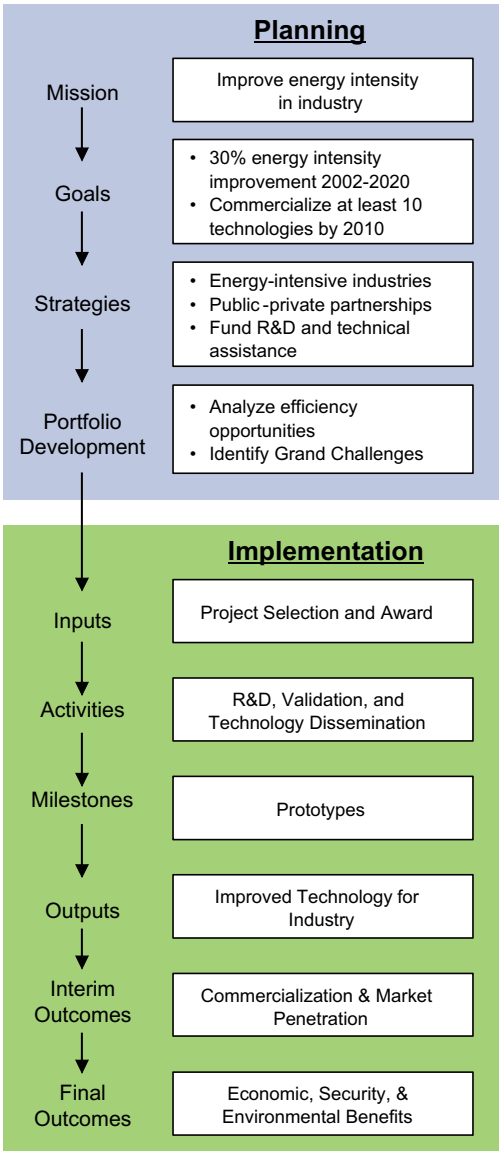
ITP Program Benefits to Date

- In 2002, industrial energy savings of over 265 trillion Btu worth $1.3 billion
- Cumulative 1990-2002 energy savings estimated at over 2,650 trillion Btu
- 160 commercialized technologies
- Over 6,000 U.S. plants use EERE technologies and services

Program Planning and Evaluation

Program planning and evaluation encompasses a variety of management functions to develop, review, track, evaluate, and adjust the ITP portfolio. Due to the complex nature of the industrial technology portfolio, sophisticated planning and evaluation techniques have been an important part of ITP and its predecessor organizations for many years. As a result, ITP has developed an outstanding track record of estimating program benefits, conducting external reviews, tracking technology impacts, and pioneering innovative technology

ITP Planning and Implementation



planning techniques. Over the years, these functions were favorably reviewed by the Secretary of Energy Advisory Board, the National Research Council, and the EERE Strategic Program Review and subsequent improvements were made. Key features of ITP's planning and evaluation approaches are highlighted below.

Program Planning

EERE's Program Management Initiative was introduced in 2001 to create a framework for program planning, budget formulation, budget execution, and analysis and evaluation for all EERE programs. These functions are integrated into EERE's Strategic Management System, which provides the foundation for a logical, structured planning and budgeting process. The Deputy Assistant Secretary for Business Administration provides annual guidance to ITP and the other EERE programs and outlines the specific requirements for program planning and budget development throughout the annual planning cycle.

- **Planning Documents.** Three documents describe the long-, mid-, and near-term plans for the Industrial Technologies Program:
  - Strategic Plan - Outlines the long-term goals and objectives of ITP and the core strategies that will be pursued to achieve them.
  - Multiyear Program Plan - Identifies the key program elements required to achieve ITP strategic goals, including milestones, key decision points, and required resources.
  - Annual Operating Plan - Describes the projects, performers, milestones, and spending plan for the current year based on the multiyear program plan.

- **Portfolio Management.** As ITP adjusts its portfolio to accomplish the goals and strategies outlined in this Strategic Plan, effective portfolio management becomes increasingly important. ITP's new thrust in identifying and initiating *Grand Challenges* will require careful balancing of current projects with new efforts. ITP is adopting innovative portfolio analysis and management tools from industry and government to ensure funded activities will effectively achieve EERE goals.

- **Performance-Based Management.** ITP, working in conjunction with EERE's Office of Planning, Budget Formulation, and Analysis has developed a pilot process to directly link program inputs (e.g., funding), activities conducted by the program (e.g., R&D), the resulting outputs (e.g., improved technologies), and outcomes of those activities (e.g., security benefits such as energy savings) (see diagram on this page). ITP has applied this structure to several program elements and plans to expand it to all program elements.

Program Evaluation and Peer Review

ITP regularly engages external peers to conduct both prospective and retrospective reviews of program activities, in order to ensure that the program is focusing its scarce resources on the most important technical opportunities, selecting high-quality research proposals, and prudently investing public funds to maximize program benefits. ITP strives to improve and strengthen its policies by adopting best practices for peer review and implementing recommended actions. In ITP, peer review consists of three primary components:

- **Merit reviews.** In this prospective peer review activity, ITP follows DOE merit review procedures in selecting projects from competitive solicitations. Well-qualified individuals evaluate and rank proposals, using specific evaluation criteria such as energy benefits and technical merit, and recommend the funding of specific projects by DOE.

- **Project reviews.** In this activity, ongoing research projects are reviewed annually by industry experts to assess past performance and accomplishments and planned project activities. These evaluations are just one of several factors that may result in an adjustment of research direction or financial support for a particular project.

- **Program reviews.** From its inception, ITP has been periodically subjected to retrospective reviews to evaluate whether program benefits have and continue to justify the expenditure of public funds. These outside evaluations have focused on the overall program as well as specific program elements, and typically involve the extensive use of scientific and technical experts and industry stakeholders — most notably, review committees of the National Academy of Sciences. In addition, these and other advisory committees often provide input on the content and direction of the program, which is used for strategic planning purposes.

Performance Indicators

ITP has always emphasized the importance of estimating the expected benefits of existing and proposed projects. The 1993 Government Performance and Results Act (GPRA) required Federal agencies to develop a performance plan and to establish, track, and report on performance measures. As a result, EERE has implemented a consistent process to track key metrics for energy, energy-related cost savings, carbon emissions, and other benefits.

ITP Performance Indicators

Outputs
- # of technologies commercialized
- # of Allied Partners
- # of energy-intensive plants affected including replication
- # of internet information page views on the ITP web site

Outcomes
- Energy saved through ITP activities (trillion Btu)
- Greenhouse gas emissions avoided (million metric tons of carbon equivalent)
- Energy expenditure savings ($ billion)

ITP recognizes that performance indicators can measure outputs and outcomes. *Outputs* are tangible results that reflect successful completion of program activities. *Outcomes* are the desired end results that enable EERE and ITP to achieve their mission. While *outputs* are mostly within the management and control of ITP, *outcomes* require actions and decisions to take place within industry

and the marketplace that may be influenced by many factors outside of ITP's control (e.g., energy prices).

- **Benefits analysis** is conducted to support program management and decision making. The analysis calculates the potential energy, economic, and climate change benefits of its portfolio of projects, pursuant to the Government Performance and Results Act (GPRA). ITP estimates future technology impacts using documented technical and economic data and an EERE-developed market penetration model. Results are reviewed and validated by EERE's Office of Planning, Budget Formulation and Analysis.

- **Tracking energy savings** of commercialized technologies previously funded in ITP's R&D program helps to verify the energy, environmental, and economic impacts of our Federally-funded R&D. Since 1980, 160 ITP-funded technologies have been commercialized and have saved 2.65 quads.

- **OMB R&D Scorecard and Program Assessment Rating Tools (PART)** are diagnostic tools that use objective data to formally assess and evaluate Federal programs on a wide variety of performance issues. The resulting scores are to be displayed in the budget. ITP, working in conjunction with EERE's Office of Planning, Budget Formulation, and Analysis, prepares data inputs to these tools to enable effective evaluation.

- **Annual performance plans** are required from each Federal agency as part of the GPRA. The DOE Annual Performance Plan FY 2004 includes 17 specific goals; ITP contributes most directly to Goal 2, Energy use and green-house gas emissions versus the Gross Domestic Product (GDP) are reduced by 40 percent by 2025 compared to 2000 and the growth versus the U.S. population stops by 2025.