



U.S. Department of Energy  
Energy Efficiency and Renewable Energy

# Industrial Technologies Program



*NASEO Energy Outlook Conference  
Industrial Committee meeting*

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Industrial Technologies Program, EERE

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# Overview

- The Industrial Technologies Program's (ITP's) Focus
- ITP Budget and Resources
- ITP Results and Highlights
- ITP State Activities



# ***ITP's Focus***



# Mission and Strategy

## MISSION

Improve the energy efficiency of U.S. industry through coordinated research and development, validation, and dissemination of innovative technologies and practices. Partner with industry and other stakeholders to

- Save energy
- Improve productivity
- Reduce reliance on foreign oil
- Reduce environmental impacts

## STRATEGY

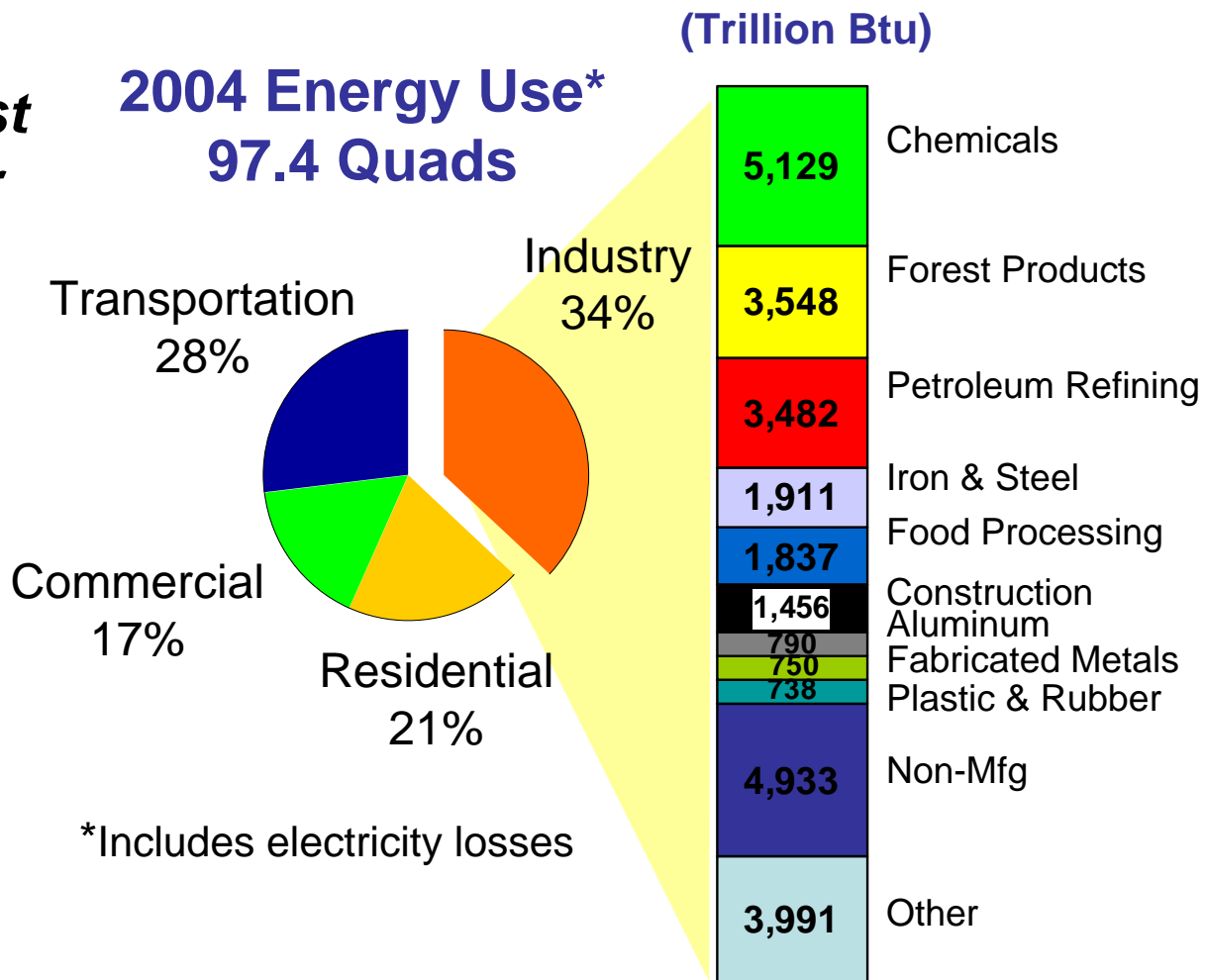
- Focus on energy-intensive industries
- Use public-private partnerships to plan and implement the program
- Identify technology platforms to dramatically improve industrial energy efficiency
- Implement a balanced technology portfolio
- Perform process-specific and crosscutting R&D to improve long-term energy efficiency
- Perform technology delivery activities to improve near-and mid-term energy efficiency



# Industry: Critical to National Energy Picture

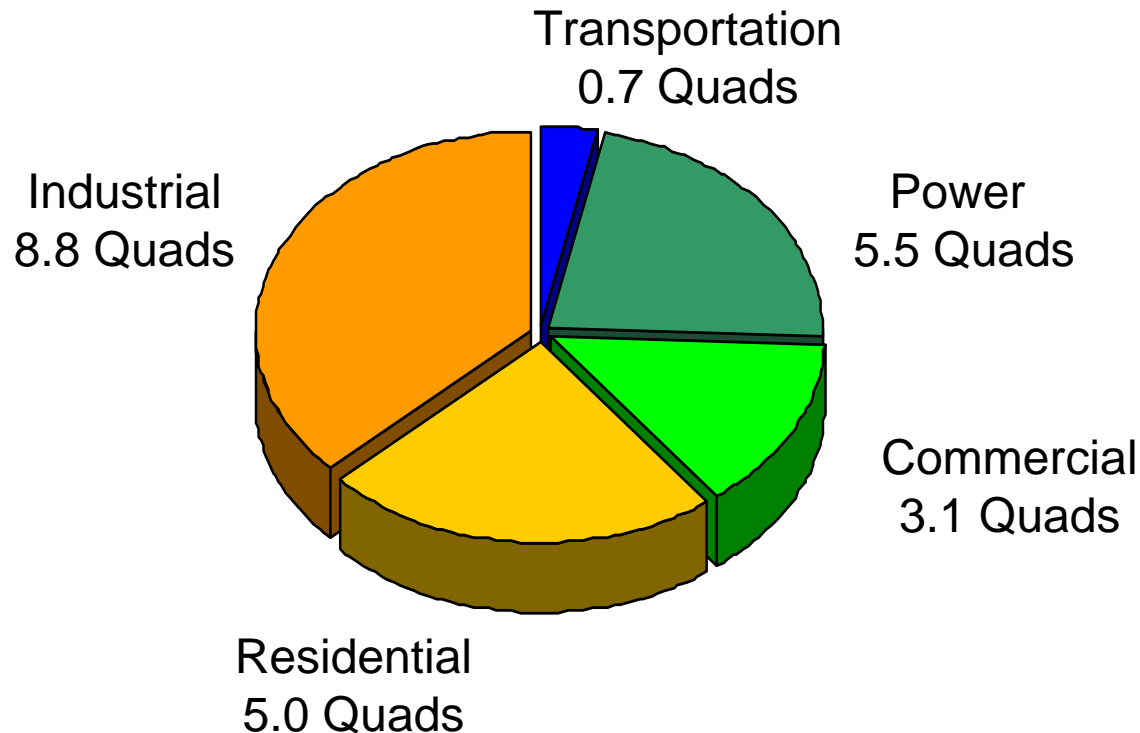
***Industry is the largest energy using sector***

- **40% of U.S. natural gas demand**
- **28% of U.S. electricity demand**
- **30% of U.S. greenhouse gas emissions**





# U. S. Consumption of Natural Gas By Sector, 2004

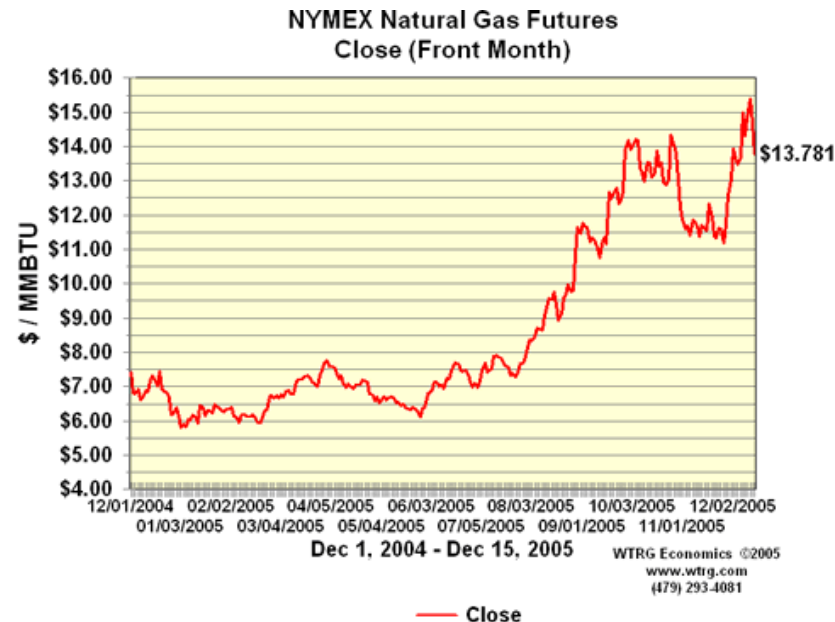


**Industry > 40% of total U.S. Natural Gas Use**



# Challenges for Energy-Intensive Industries

- Rising energy prices
- Industry concern about natural gas costs and availability
- Influence of the emerging economies on energy and commodity prices
- Difficulty for process industries to make needed investments in R&D and commercialization
- Potential for “game-changing” scientific advances (e.g. nanotechnology) to transform industries





# ***ITP's Budget and Resources***



	FY 2005	FY 2006	FY 2007
Forest and Paper Products Vision	6,103	3,560	2,878
Steel Vision	5,489	3,625	3,613
Aluminum Vision	5,390	3,085	2,265
Metal Casting Vision	3,862	2,406	982
Glass Vision	2,511	1,696	0
Chemicals Vision	9,943	7,481	6,787
Mining Vision	3,394	1,022	0
Supporting Industries	677	691	0
SBIR/STTR	0	679	476
<b>Total, IOF (Specific)</b>	<b>37,369</b>	<b>24,245</b>	<b>17,001</b>
Industrial Materials for the Future	9,642	11,033	9,847
High Efficiency Combustion Systems	1,544	0	2,357
Robotics	1,972	0	0
Sensors & Automation	994	3,061	3,051
Industrial Technical Assistance	15,110	14,355	12,868
<i>Industrial Assessment Center</i>	6,904	6,435	4,035
<i>Best Practices</i>	8,206	7,920	8,833
Congressionally Directed Activities	3,000	0	0
SBIR/STTR	0	406	439
<b>Total, IOF (Crosscutting)</b>	<b>32,262</b>	<b>28,855</b>	<b>28,562</b>
Technical and PM Services	3,740	3,755	0
<b>Total</b>	<b>73,371</b>	<b>56,855</b>	<b>45,563</b>



# *Delivering Technology Solutions*



Partnerships

## Collaborative R&D



- Energy-intensive Process Technologies
- Crosscutting Technologies

## Technology Delivery



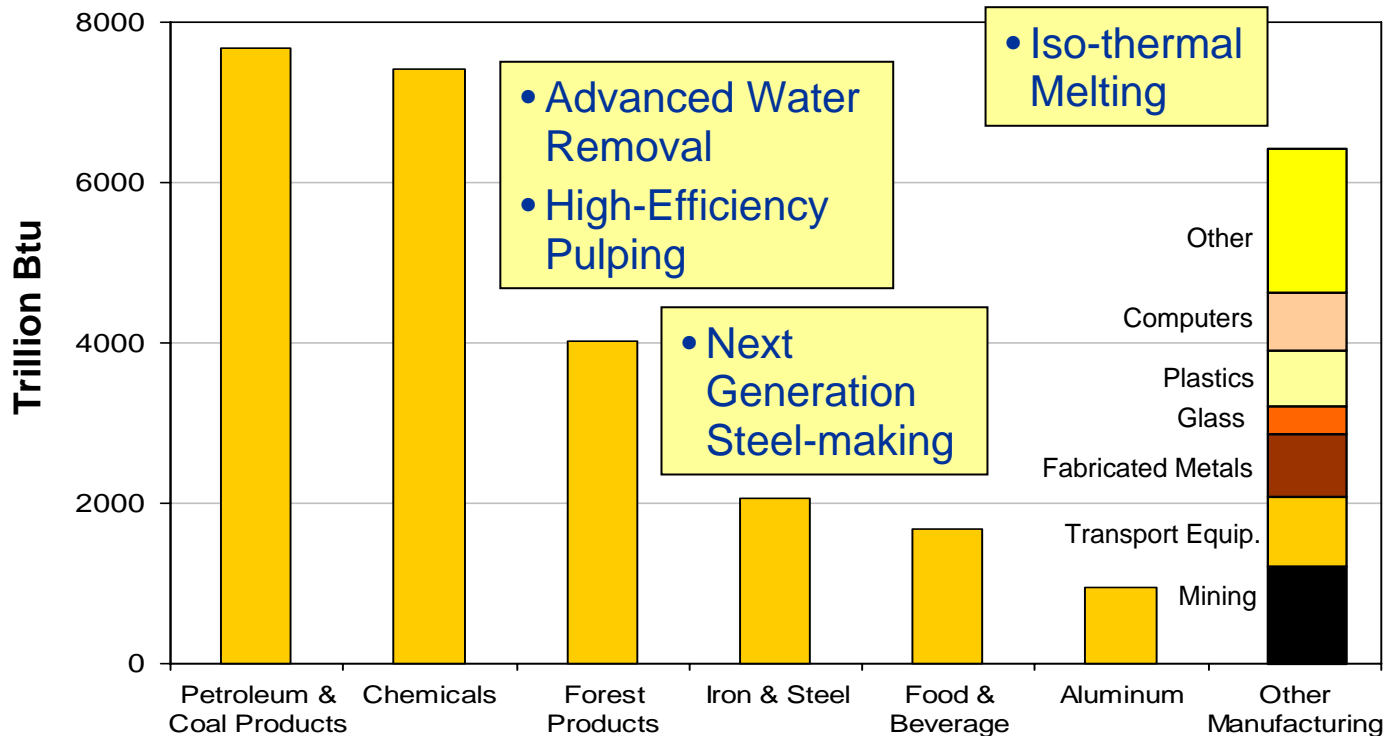
- Assessments
- Training & Tools



# Types of R&D Supported by ITP

## Process specific

- Hybrid Distillation
- Process Intensification



## Crosscutting

- Inferential-based Process Control
- Advanced Thermo-Electric Materials
- Super Boiler
- Ultra-Hard Materials
- Natural Gas Alternatives



# Emerging Issue: Fuel/Feedstock Flexibility

## Industry Options

### Near-Term (0–5 years):

Redirect Tech Delivery to pursue natural gas saving opportunities via:

- Technology and market assessments
- Application guides explaining opportunities, implementation strategies, permitting issues, etc.
- Training and education

## Potential Natural Gas Displacement (10<sup>12</sup> Btu)

Application	Near Term (<5 yrs)	Longer Term (>5 yrs)	TOTAL
Feedstock	--	700	700
Process	300	1,380	1,680
Boiler	950	800	1,750
<b>TOTAL</b>	<b>1250</b>	<b>2,880</b>	<b>4,130</b>

### Longer-Term (>5 years): *Significant process change and permitting required*

- Explore joint opportunities with FE and other DOE/EERE technologies
- Conduct applied R&D for specific industrial applications



# Technology Delivery Resources

- **DOE-supported energy assessments:**
  - Industrial Assessment Centers
  - Energy Savings Assessments
- **Qualified specialists**
- **Energy efficiency training for plant staff**
- **Energy analysis software tools**
- **Case studies and information**



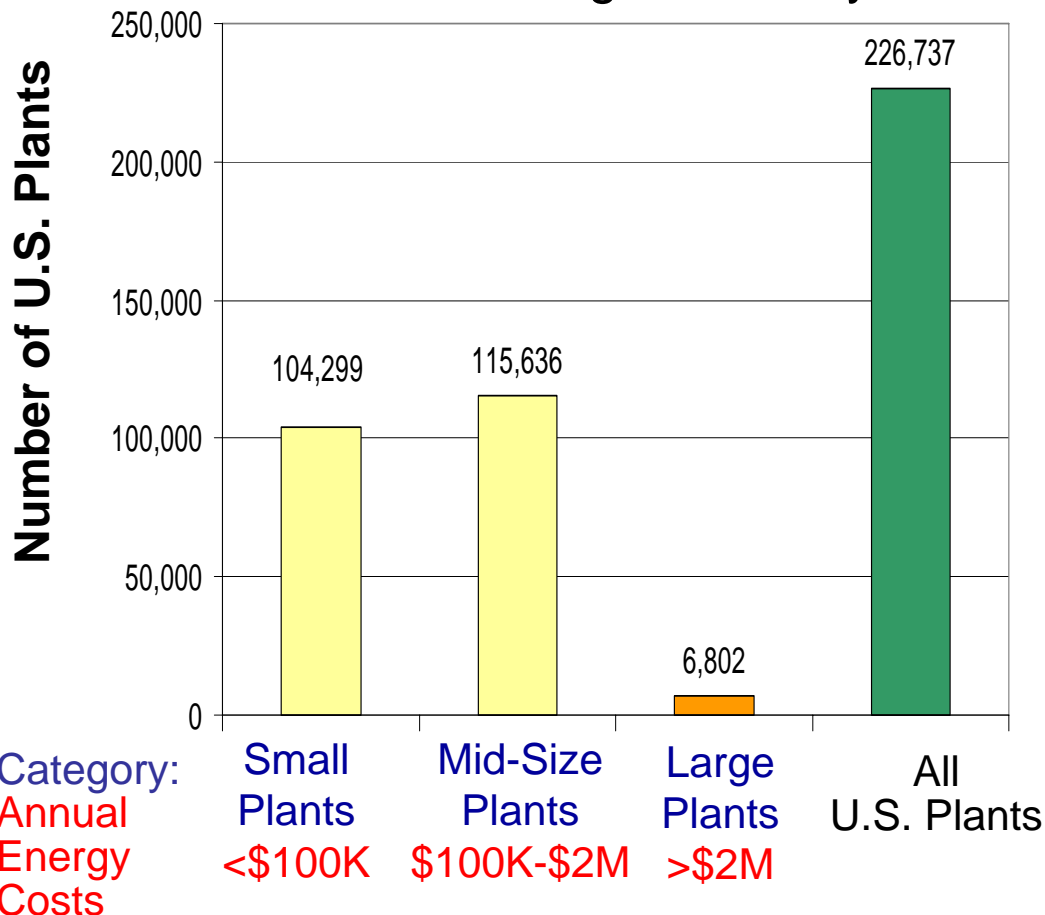
Info Center: 1-877-337-3463

Websites: [www.eere.energy.gov/industry/bestpractices](http://www.eere.energy.gov/industry/bestpractices)  
[www.eere.energy.gov/industry/saveenergynow](http://www.eere.energy.gov/industry/saveenergynow)

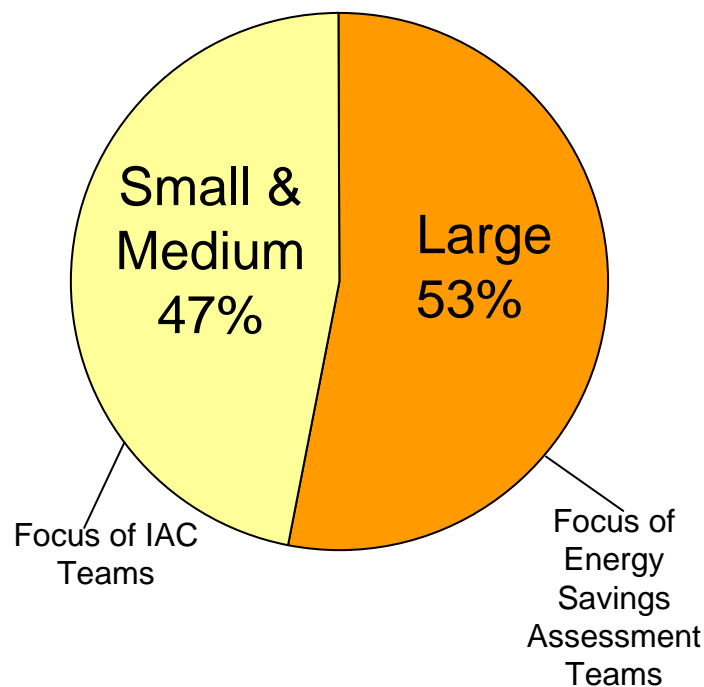


# Technology Delivery Focus

### U.S. Manufacturing Plants: By Size



### Percent of Total Industrial Energy





# Secretarial initiative: “Save Energy Now”

## Goals:

- Encourage industry to voluntarily reduce its energy usage in a period of tight supplies by working with America’s largest energy-intensive plants
- Create momentum to significantly improve energy efficiency practices throughout the manufacturing sector

## Status to Date

- 200 plants selected in 39 States (15% of manufacturing gas use)
- Initial 6 assessment results
  - potential savings of 6.7% of plant’s natural gas use
  - \$10 million/year cost savings
- 9 assessments completed, 32 plants scheduled
- 228 mid-sized plants referred to Industrial Assessment Centers
- 102 smaller plants to receive customized information



# Completed and Scheduled assessments





## FY2006 ITP RD&D Solicitations

		<u>Estimated Total</u>
• Chemicals	Closed	~ \$10 million
• Innov. Energy Systems	through 2/08/06	~ \$ 4.0 million
• Inventions & Innov.	Closed	~ \$ 2.0 million
• Materials for EE	Closed	~ \$ 7.6 million
• Materials (Labs)	Closed	~ \$ 8.5 million
• Steel	Spring 2006	~ \$ 4.0 million



# ***ITP Results and Highlights***



# ITP Accomplishments

- ☆ More than 160 commercialized technologies to date
- ☆ Nearly 4 quads of energy saved since program inception; 352 trillion Btu in 2003 alone\*
- ☆ 10 *R&D 100* awards since 2000; 31 awards since 1991
- ☆ Over 13,000 U.S. manufacturing plants improved through Technology Delivery
- ☆ Launched 200 plants ESA team campaign in support of Secretarial “Easy Ways to Save Energy” initiative in 2006
- ☆ Conducted successful Ohio Technology Showcase





# ***ITP State Activities***



# Selected State and ITP Accomplishments

- California Energy Fairs (2001 – 2002)
- Nevada Mining Energy Solutions Event (2002)
- Saving Water; Saving Energy in Colorado (2003)
- Texas Technology Showcase (2003)
- Ohio Technology Showcase (2005)
- Western US Food Processing Efficiency Initiative (2004 – 2006)
- 1 STAC project funded in 2005
- 21 SEP special projects funded in 2005

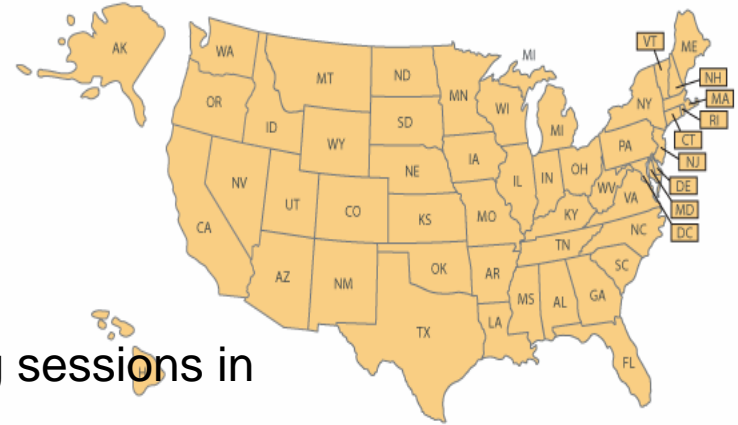




# State Activities

## Current State Activities:

- **20** Currently funded SEP states
- **39** States hosting Energy Saving Assessments
- **29** States to host **118** BestPractice Tool training sessions in FY 2006



## Planned State Activities:

- Construct a state resource site for industry, host on Save Energy Now website with state activity

## Future State Activities:

- Save Energy Now cost-shared energy saving assessments and follow-up to plants
- BestPractices outreach
- Fuel flexibility (coal gasification, and combined heat and power)
- Energy Efficiency Technology information dissemination and commercialization



# What does this mean for ITP and State partners?

- Work effectively with resources we have.
- Mutually agree on top collaboration areas.
- Focus on best activities for tangible results.
- Use innovative collaboration mechanisms.
- Involve other stakeholders.
- Remain committed to build relationship.