

The background of the slide is a solid red color. In the top left corner, the word "RUTGERS" is written in a large, white, serif font. Below it, in a smaller, white, sans-serif font, are the words "THE STATE UNIVERSITY OF NEW JERSEY". A large, faint, circular seal of Rutgers University is visible in the background, centered behind the text. The seal features a sunburst design and the text "RUTGERS THE STATE UNIVERSITY OF NEW JERSEY" around the perimeter.

RUTGERS

THE STATE UNIVERSITY  
OF NEW JERSEY

# Critical Workforce Needs in Energy

Michael R. Muller

Professor and Director

Rutgers University

## Who is this guy?



**Michael R. Muller**

**Professor & Director**

- At Rutgers since 1979
- Ran IAC from 86-92
- IAC Field Manager since then
- Director, *Center of Advanced Energy Systems* At Rutgers since 2002
- Current passions:
  - Steam engines
  - Operation of cooling towers
  - NOx in biofuels

# The Workforce “Perfect Storm” – PSEG CEO

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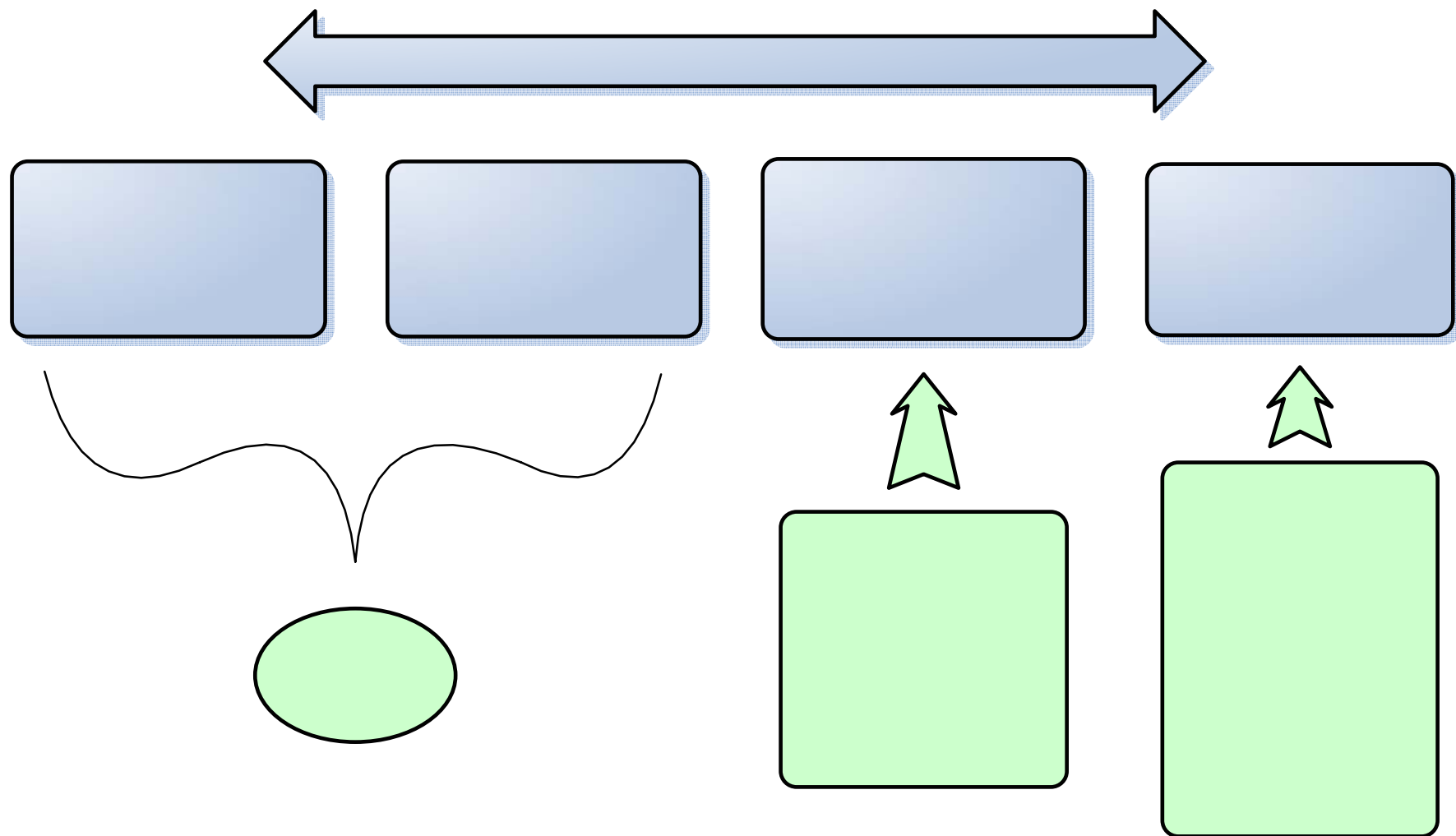
**June 27, 2008**

**Combating the Utility Workforce Perfect Storm**

PSEG executive warns that baby boomer retirements and a demand for a new energy infrastructure and green collar workers present major challenges for utility industry

- Workforce issues impact competitiveness
- Competitiveness impacts national security

# Workforce Solutions Depend on the Tasks!



**Short**

# The Federal Government is Already Making a Difference

- Great Example: **The DOE Industrial Assessment Centers**
  - A University-Based Technical Assistance Program
- IACs are located at accredited engineering schools throughout the USA
  - Major function is to perform industrial assessments at nearby manufacturing centers.
  - Assessments are performed by teams made up of **faculty and students**
  - Normally consists of a one day site visit at an industrial plant



# What is an Industrial Assessment?

- A brief, but thorough evaluation of a manufacturing plant by an external team of technical experts
- An “energy audit” grown up
- Must be integrated to include waste and productivity (dangerous, otherwise)





# The IAC Industrial Assessment (cont.)

- Results in a formal report being sent to the client firm
  - Each report has several recommendations which provide:
    - Sufficient engineering design to explain the recommendation
    - Anticipated savings
    - Implementation costs
    - Simple payback
- Students fully involved
  - Pre-Assessment prep
  - Onsite data and measurement
  - Post-assessment analysis
  - Report writing
  - Presentation of results



# The IAC DATABASE

- Publicly Available
- Contains:
  - Facility data
  - Recommendation data
  - Implementation data
- Searchable by
  - Size (in energy usage, employees, etc...)
  - Industry Type (NAICS or SIC)
  - Location
  - Recommendation Type
- Updated in Real-Time as the assessments are completed





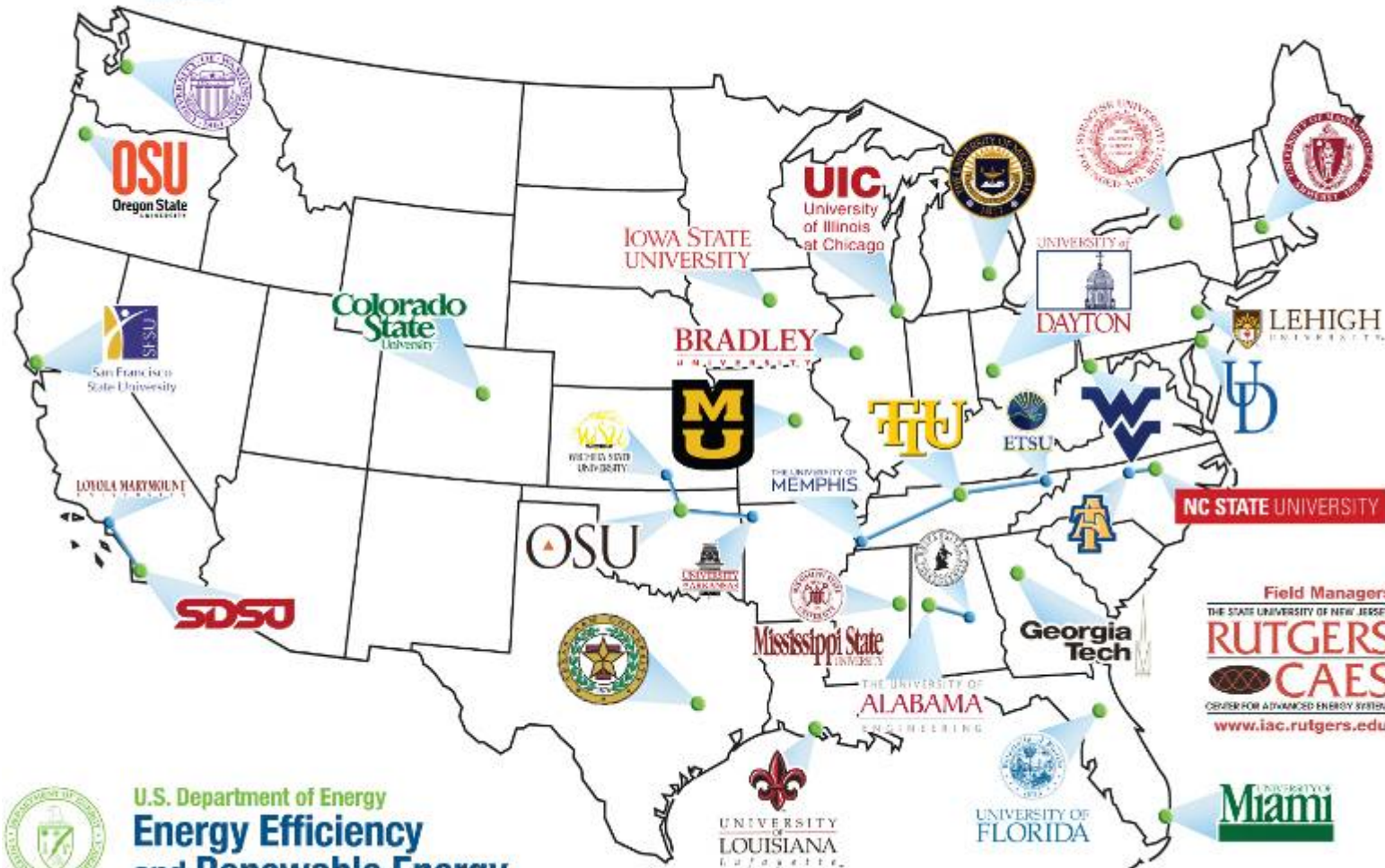
## IAC – *Industrial Assessment Centers*

- Created in 1974
- 26 IAC located at 34 Universities across the Country
- 13,900+ Assessments Conducted
- 103,700+ Recommendations
- Total Implemented Savings: **\$4.5 Billion**
- Median Implementation Rate: **50.0% of Recommendations**
- Median % Energy Savings vs Total Energy Costs for the Last 5 Years: **11.6%**
- Field Managers:





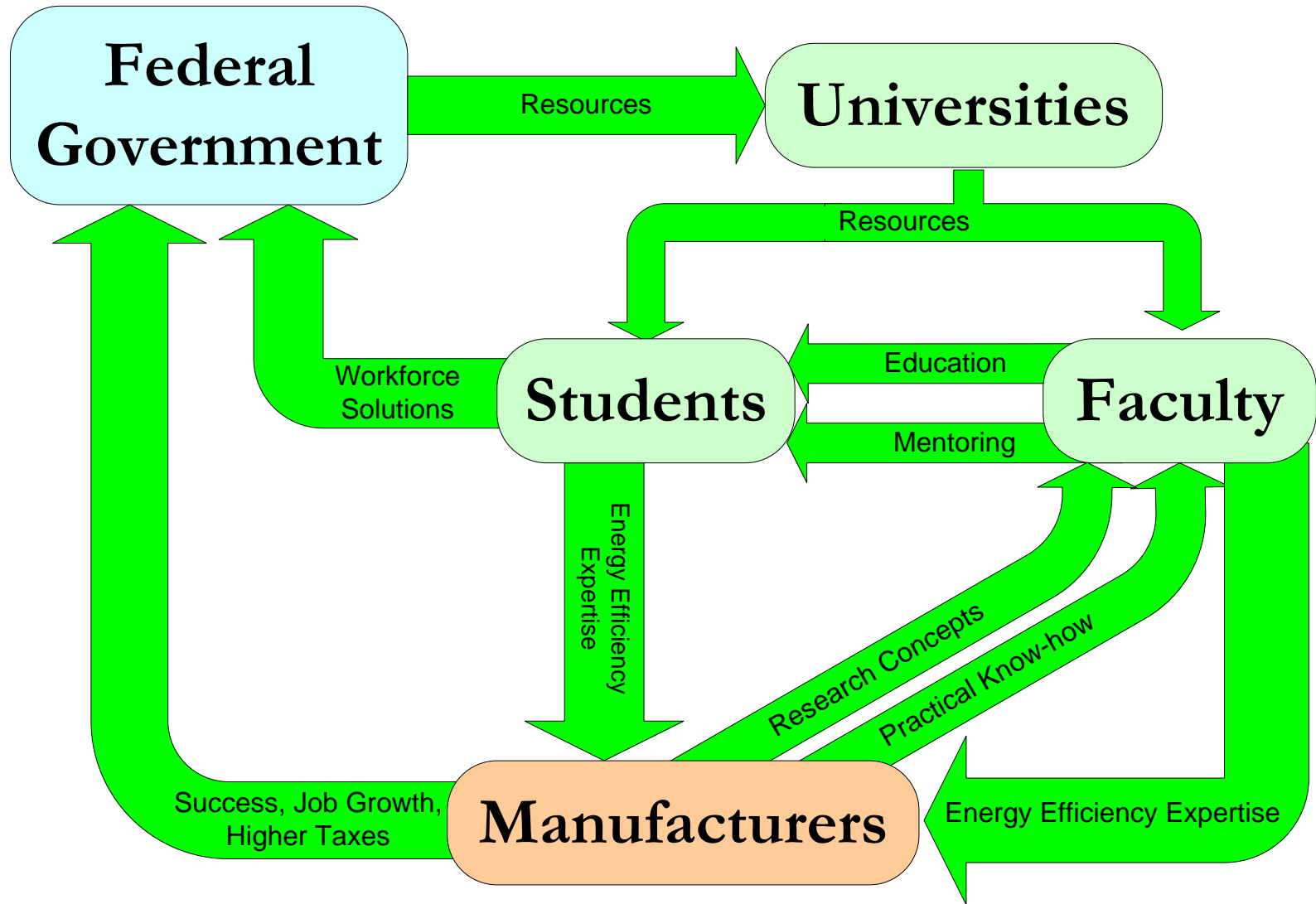
## Industrial Assessment Centers 2006-2011



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

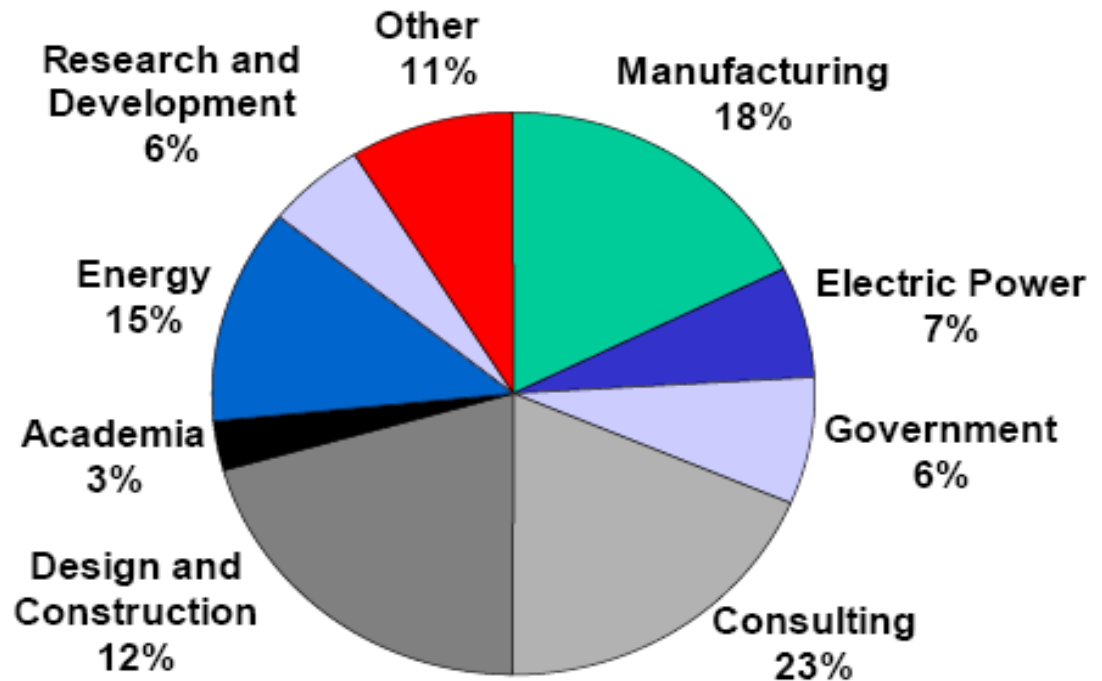
Bringing you a prosperous future where energy is clean, abundant, reliable, and affordable

Who wins? Everyone!



# Does the IAC help with workforce issues?

IAC Alumni Employment by Sector



*2,500 alumni since 1977  
with 56% now working in  
energy related positions!*

# Adding Faces to the Data

- Centers have dozens of alumnae – great success stories are everywhere
  - Any center director could do this presentation!
- For today, I am just looking at Rutgers
  - Taking six examples from our distinguished alumnae board







Name:	Sunil Shah
Status:	1988 Graduate
Employer:	BGI, Inc. (Now ConEd Solutions)
Assignment:	Vice President of Operations

Name:	David Abbe
Status:	1991 Graduate
Employer:	GlaxoSmithKline
Assignment:	Manager, Engineering & Capital Projects



Name:	Brindesh Dhruva	Name:	Tim Barnish
Status:	1993 M.Sc. Graduate	Status:	1994 Graduate
Employer:	Schlumberger	Employer:	Johnson Controls Inc.
Assignment:	Carbon Sequestration	Assignment:	LEED Performance Assurance Specialist



Name:	Kyri Papadaratsakis
Status:	2002 Graduate
Employer:	Schering Plough
Assignment:	Energy Assessments and QA

Name:	Dan Furman
Status:	2004 Graduate
Employer:	Foster Wheeler
Assignment:	Energy Efficient Boiler Design

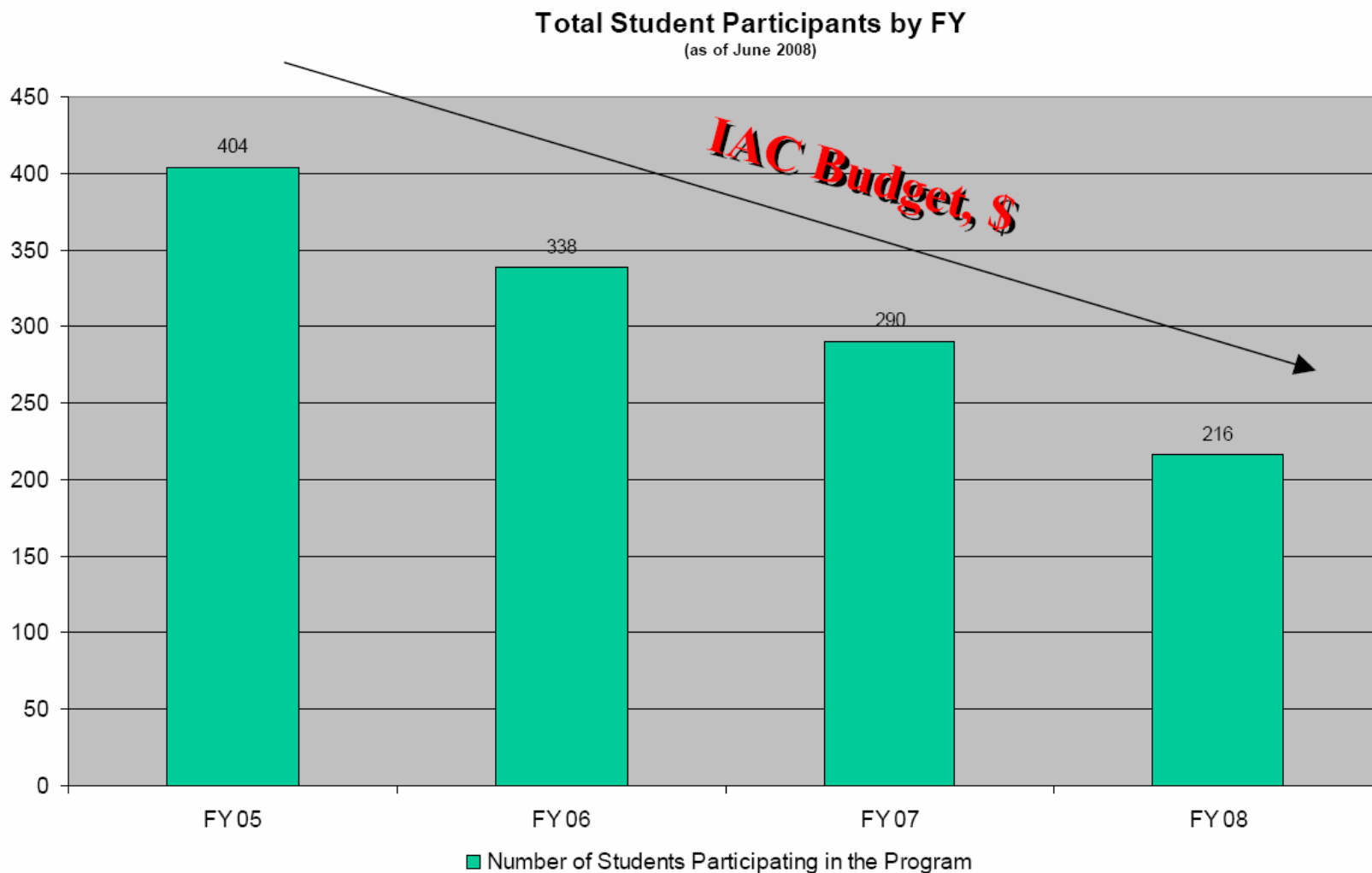
# How is the Program Doing???

- Budget cuts are impacting the program dramatically

Year	2000	2001	2002	2003	2004	2005	2006	2007
<b>EERE Funding</b>	\$1,043.791 M	\$1,180.295 M	\$1,279.153 M	\$1,202.326 M	\$1,220.262 M	\$1,234.313 M	\$1,162.747 M	\$1,457.241 M
<b>ITP Funding</b>	\$175.2 M	\$148.6 M	\$100.9 M	\$96.8 M	\$93.1 M	\$73.0 M	\$57.0 M	\$45.6 M
<b>IAC Funding</b>	<b>\$8.100 M</b>	<b>\$8.300 M</b>	<b>\$5.774 M</b>	<b>\$6.694 M</b>	<b>\$6.694 M</b>	<b>\$7.150 M</b>	<b>\$6.500 M</b>	<b>\$4.035 M</b>

- Per center impact includes:
  - Reduction in the number of centers (30 → 26)
  - Reduction in funding by 50% (~\$200k per yr → ~\$100k per yr)
  - Fewer Assessments (30 per yr → 12 per yr)
  - Fewer Students (number has dropped 50%)

# IAC Student Level – the bad news!





## Bottom Line

- Workforce issues in energy are big and getting bigger
- The DOE's Industrial Assessment Centers are an important federal effort
  - Provides a steady stream of top young engineers into energy efficiency careers
  - Helps small and medium sized manufacturers save energy and cope with the enormous recent increases in costs
  - Carefully utilizes Federal \$\$ - the centers make their nickels scream!
  - Develops energy efficiency expertise in faculty at our top engineering schools
- But, funding decreases are reducing the impact of the IAC's in a time of skyrocketing energy prices