

# NYSERDA Overview

## Industrial and Buildings R&D

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Industrial and Buildings R&D

ASERTTI Fall Meeting  
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# NYSERDA Overview

- Public Benefit Corporation established in 1975
- Mission: provide solutions to NY energy challenges in ways that benefit the NY economy and environment
- Broad definition of “energy challenges”
- Establish and maintain strategic partnerships
- Competitive and market-oriented approach to make risk reduction investments
- Cost sharing requirements for most contracts
- Bottom-up planning and program implementation with top-down approval
- Emphasis on objectivity, fairness, transparency and procedure
- Funding appropriated by administrative process
- Three levels of financial and procedural audits

# NYSERDA Organizational Programs Structure

- Research and Development
- Institutional and Commercial Energy Efficiency Services
- Residential and Low Income Buildings Energy Efficiency
- Energy Analysis and Program Evaluation
- High and Low Level Radioactive Waste Management
- Saratoga Technology and Energy Park



**SARATOGA  
TECHNOLOGY +  
ENERGY  
PARK**

- STEP is a knowledge-based community dedicated to the development of clean energy technologies
- Locating companies to STEP
  - Seven companies so far
- Expected to attract more than 3,000 jobs to the Capital Region
- Designated an Empire Zone
- Partners: Saratoga Economic Development Corp., University at Albany, Town of Malta

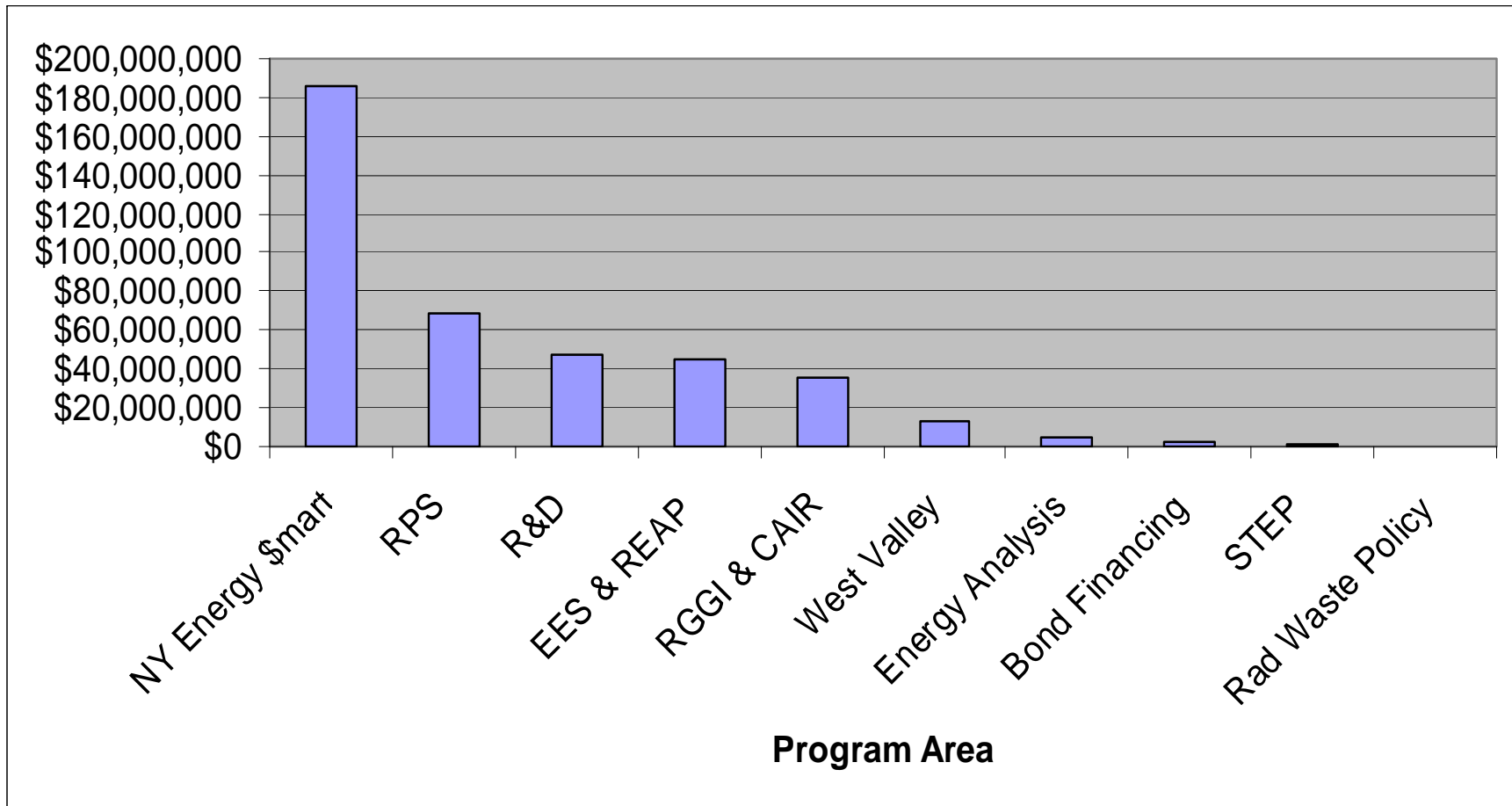


# NYSERDA Financial Investment Resources

|   |                                 |
|---|---------------------------------|
| Systems Benefit Charge                            | \$ 175 Million/year             |
| Renewable Portfolio Standard                      | \$ 720 Million over 8 years     |
| Statutory R&D Program                             | \$ 16 Million/year              |
| Federal Funds                                     | \$ 2-5 Million/year (variable)  |
| Cooperative State R&D<br>and Legislative Projects | \$ 0-30 Million/year (variable) |

**95+ % of Funds Competitively Awarded**

## NYSERDA Budget FY 2008-2009 = \$403,738,000



## R&D Program – General Characteristics

- 5 R&D Program Areas (Industry, Buildings, Energy Resources, Transportation & Power Systems, Environmental R&D) + Renewable Portfolio Standard
- Primary interests - applied research, demonstration, commercialization, objective information, early stage investments
- Broad focus on science and technology within program areas
- Use of topical “scoping” sessions; meetings with companies, researchers and users of technology; and periodic program reviews
- 43 staff (including 2 Directors, 6 Program Managers and 3 Administrative staff)
- Investment budget of about \$50 Million/year (excluding RPS)
- Renewable Portfolio Standard investment budget of about \$90 Million/year

# RD&D Goals

Develop and demonstrate innovative technologies addressing:

Energy – efficiency, reliability

Environment – clean energy

Economics – enhance NYS competitiveness

# Innovative Technology Projects

- Product Development (with NYS Companies)
  - Small start-up companies
  - New products for mature companies
- Demonstration (Manufacturing Processes, Business Practices)
  - Innovative concept, technical risk
  - Emerging technology
  - Underutilized technology

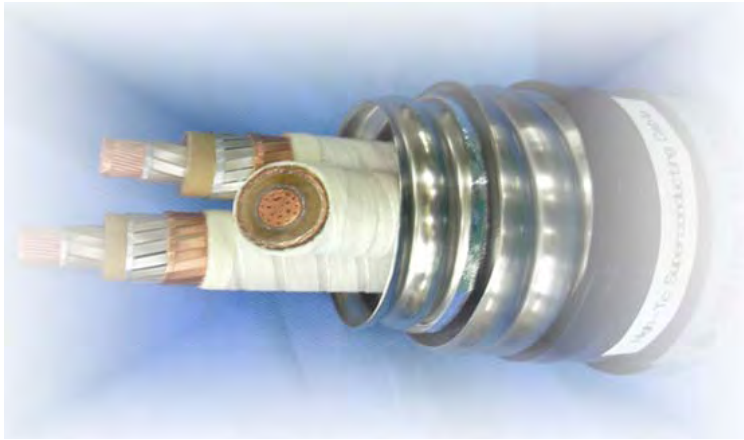
# R&D Product Development Program Results

## Quantifiable Data (2006):

- \$200 Million in new product sales
- \$1.2 Million in recoupment from new product sales
- 167 new products, processes, services introduced and successful demonstrations
- Investment in new product development  
~ \$20 Million

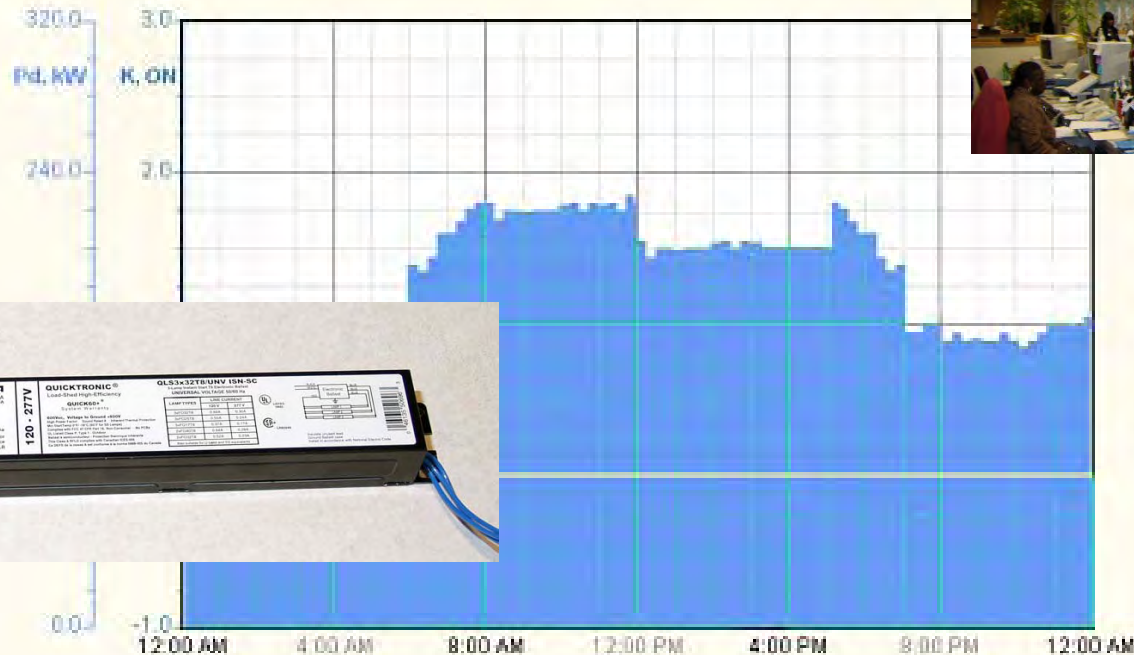
# Case Studies

# World's First Superconducting Cable in Utility Service





# Load-Shed Control



- Override
  - Managed Demand
  - Energy
  - Power Demand
  - Internal Energy
- Select All    Unselect All

- Prev Day    Next Day
- Table    Select Day

2/28/2007

Original View

Demand Limiting  Enabled  Off

Predicted Demand  kW

Managed Demand  kW

Edit

Load Curtailment  Enabled  Off

from  :  PM

to  :  PM

Duration  min

Edit

Load-Shed  Override



# Waterside Plaza – Centrally Controlled Air Conditioner

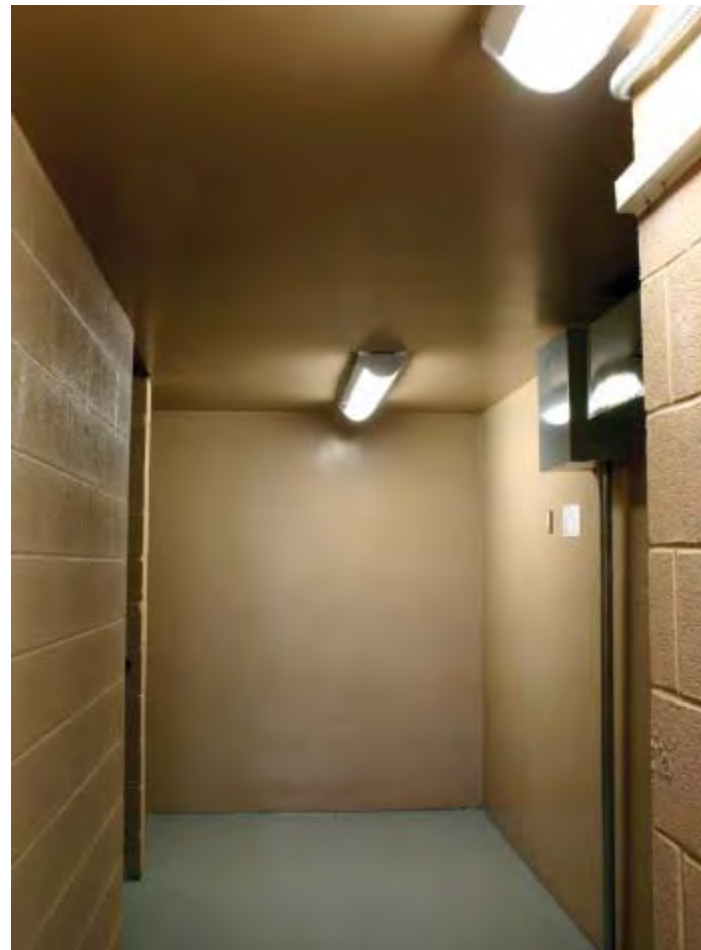


# Boiler with “Monoblock” Heat Exchanger



Aluminum Casting

# Occu-Smart Lighting System



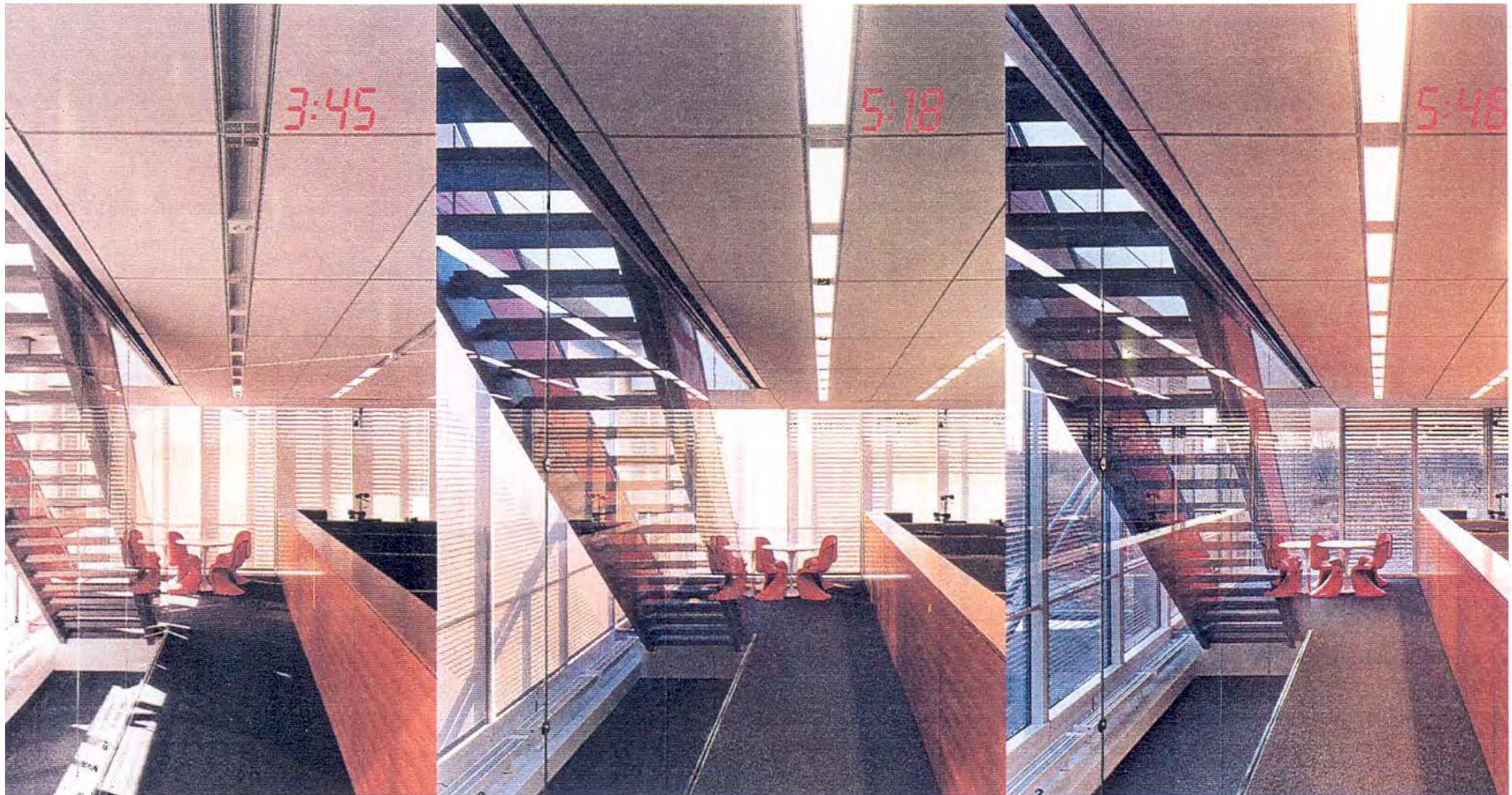
# Nano-Phosphors for Efficient LEDs Evident Technologies



## New York Times New Headquarters with Advanced Daylighting



## New York Times Daylighting Automatic Shades and Dimming



## B-20 Biodiesel for Home Heating



BE SMART. BE SURE.  
**SCHILDWACHTER**



# Hydrogen Fuel Cell Vehicle Demonstration



# Fuel Cell at Sheraton Hotel in NYC



- 250 kW Molten Carbonate Fuel Cell
- Heat Recovery for DHW
- Hoisted into place (rooftop setback)  
November 2004
- Status: Fully Operational



# Office Building at 717 Fifth Avenue



- Equity Office Properties & Northern Power Systems
- Total 1,600 kW (pair of 800 kW Natural Gas Engines)
- Engine Generators are Synchronous-Parallel
- Status: Fully Operational

# Fuel Cells at WWTP in NYC

- Eight PAFC Fuel Cells at Four Municipal WWTPs in New York City (NYCDEP)
- Heat Recovered to Support Anaerobic Digester
- Reduced On-site Emissions by Eliminating Flare
- NYSERDA: \$1,000,000  
NYPA: \$12,000,000
- All 8 Fully Operational



# Microturbine at Waldbaums Supermarket



One Capstone 60 kW Microturbine  
Operates 24/7 on Natural Gas  
Space Heating  
Desiccant Cooling/Dehumidification  
Status: Fully Operational



# ThermoRack 1200

## Poly and Metal Plasma Etch Temperature Control Systems



# Benefits for Customer

- Proactive dynamic temperature control for improved wafer to wafer repeatability
- Long MTBF
- Save fab space
- Substantially reduce costly repairs
- Eliminate all Freon or replacement refrigerants
- Reduce power consumption by up to 93%
- Reduce Galden, Fluorinert or HFE evaporative losses
- Eliminates first wafer effect in many processes