National Renewable Energy Laboratory
Innovation for Our Energy Future

NREL Overview

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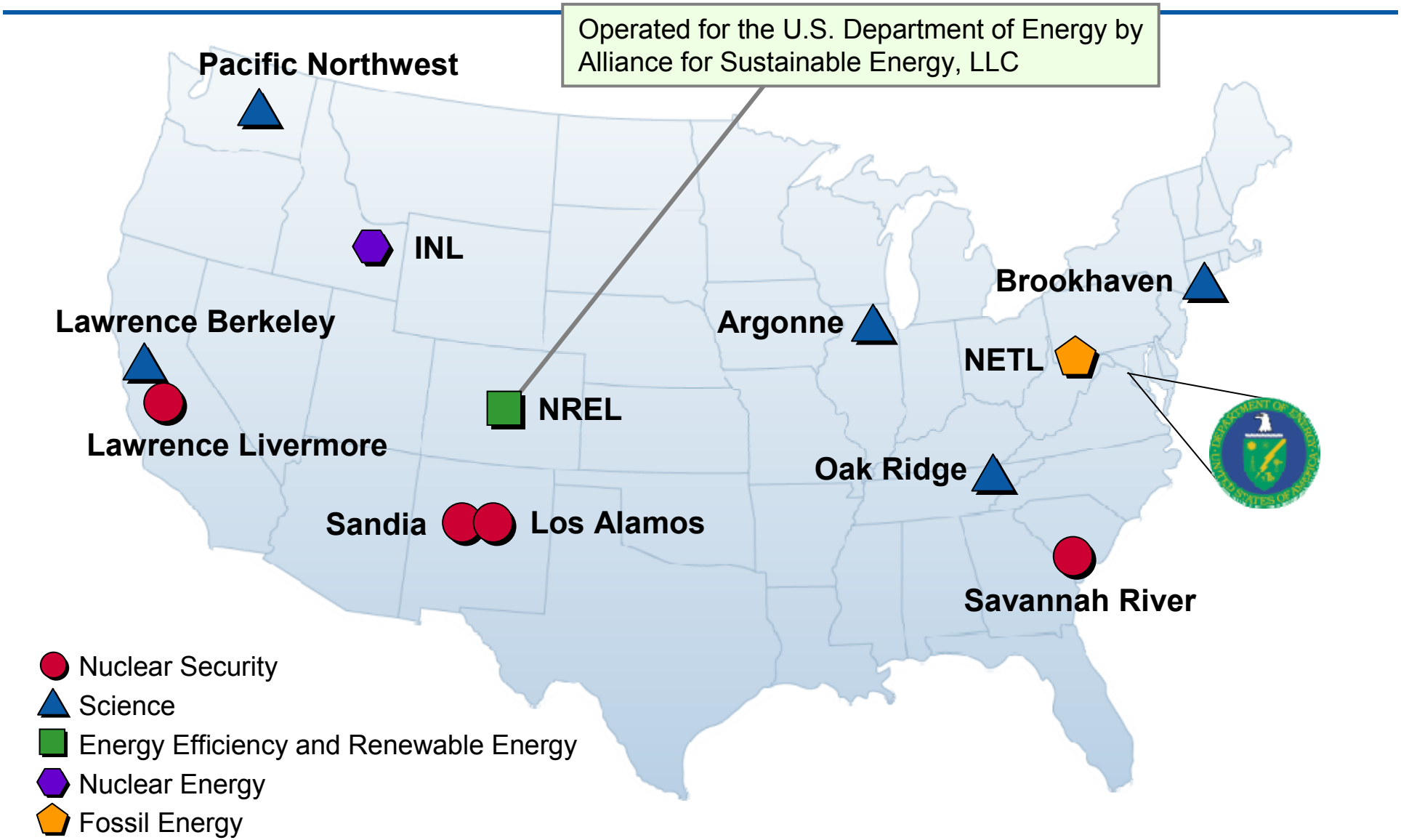
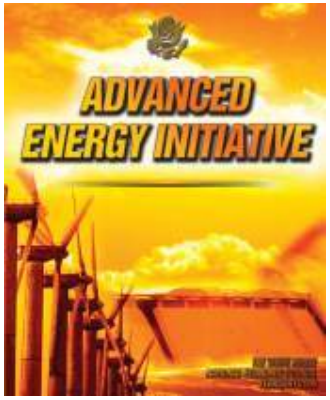
Major DOE National Laboratories



What Makes NREL Unique?

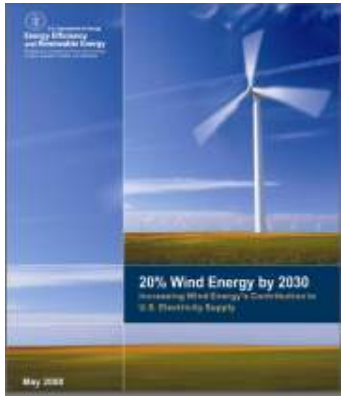
- Only national laboratory dedicated to renewable energy and energy efficiency R&D
- Collaboration with industry and university partners is a hallmark
- Ability to link scientific discovery and product development to accelerate commercialization

Setting the Bar Higher – Gigawatt-Scale Renewables



Solar Vision

10% U.S. electricity by 2025



Wind Vision

20% U.S. electricity by 2030

Energy Independence & Security Act 2007

36 billion gallons of renewable fuels by 2022

Requires investment in new infrastructure:

- Overall in U.S. = $2 trillion
- Worldwide = $22 trillion
  - Biofuels
  - Wind
  - Solar

} $2 trillion (est.)

Technology Innovation Challenges Remain
The Next Generation

- Wind Turbines
  - Improve energy capture by 30%
  - Decrease costs by 25%
- Biofuels
  - New feedstocks
  - Integrated biorefineries
- Solar Systems
  - Improved performance through, new materials, lower cost manufacturing processes, concentration
  - Nanostructures
- Zero Energy Buildings
  - Building systems integration
  - Computerized building energy optimization tools

Getting to "Speed and Scale" – Key Challenges

Implementing Renewable Gigawatts at Scale

BARRIERS

- Cost of renewable electricity
- Performance and reliability
- Infrastructure robustness and capacity
- Dispatchability of renewables

Displacement of Petroleum-Based Fuels

NREL 139-1

BARRIERS

- Cellulosic ethanol cost
- Life cycle sustainability of biofuels
- Fuels infrastructure, including Codes/Standards
- Demand and utilization, including intermediate blends

Reducing Energy Demand of Buildings, Vehicles, and Industry

NREL 196-1

BARRIERS

- Coordinated implementation of model building codes
- Market does not value efficiency
- Cost of energy efficient technologies
- Performance and reliability of new technologies

Technology Development Programs

NREL R&D Portfolio

Efficient Energy Use

- Vehicle Technologies
- Building Technologies
- Industrial Technologies

Renewable Resources

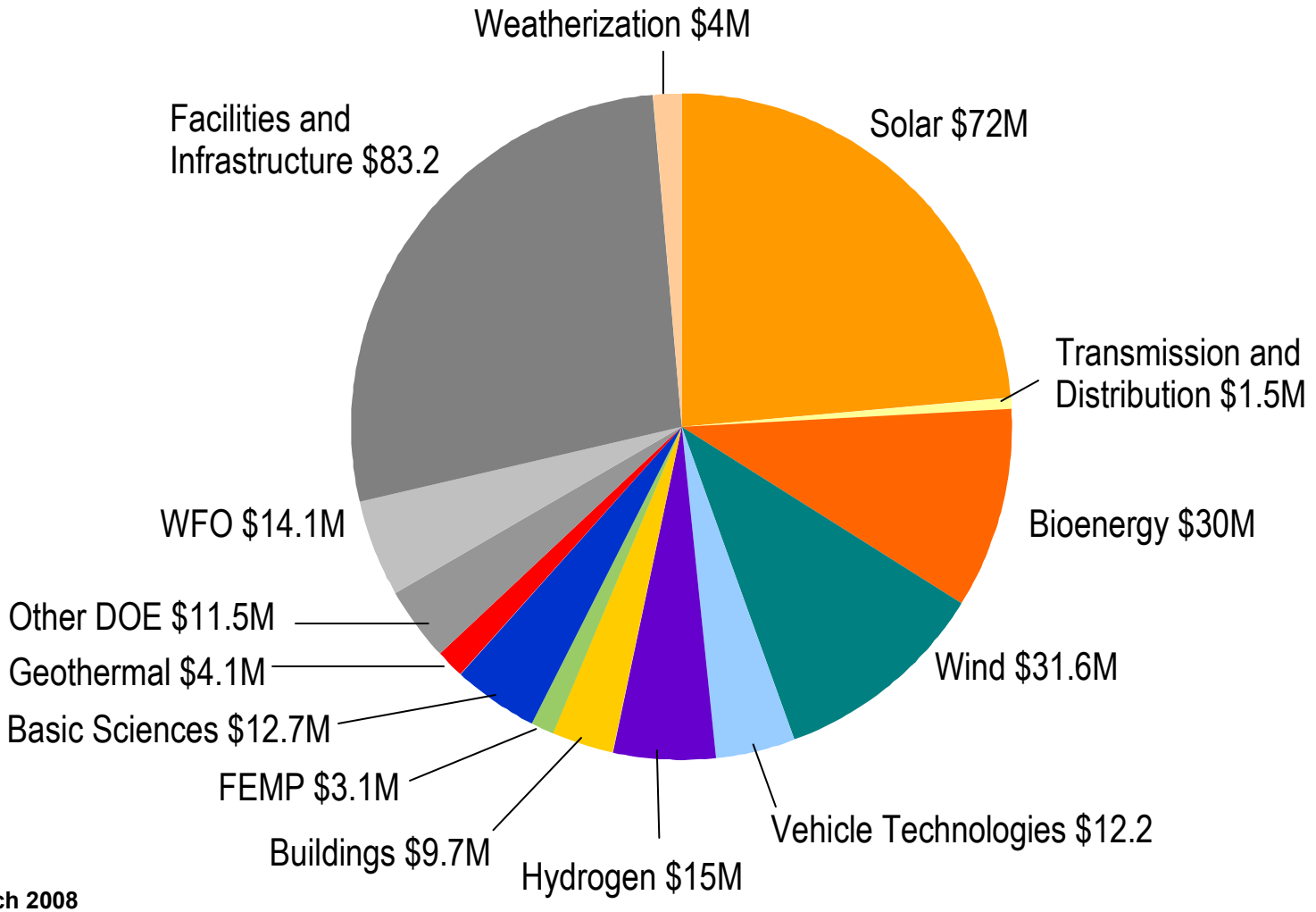
- Wind and water
- Solar
- Biomass
- Geothermal

Energy Delivery and Storage

- Electricity Transmission and Distribution
- Alternative Fuels
- Hydrogen Delivery and Storage

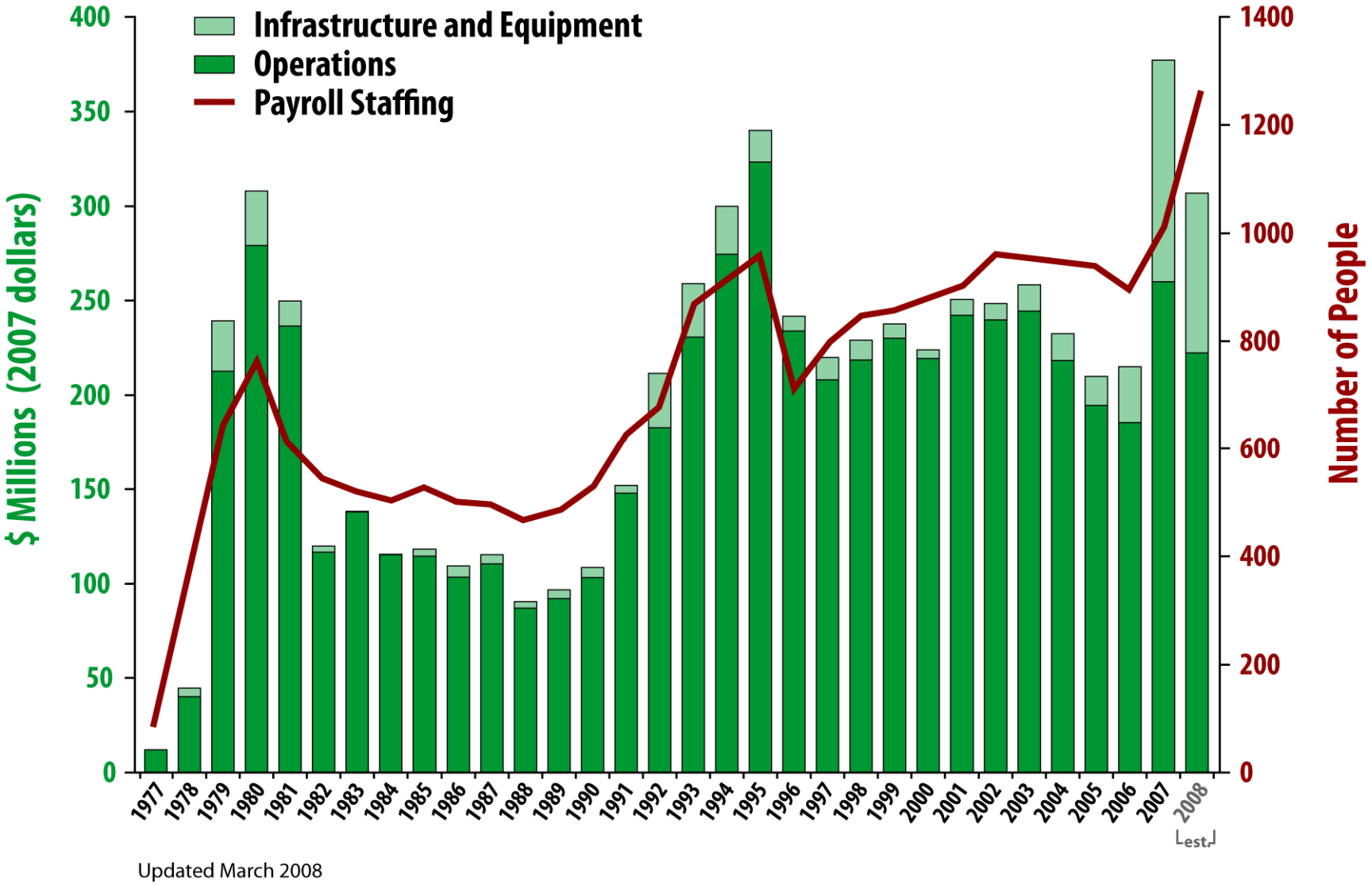
Foundational Science and Advanced Analytics

NREL FY2008 Program Portfolio
Estimated $304 Million

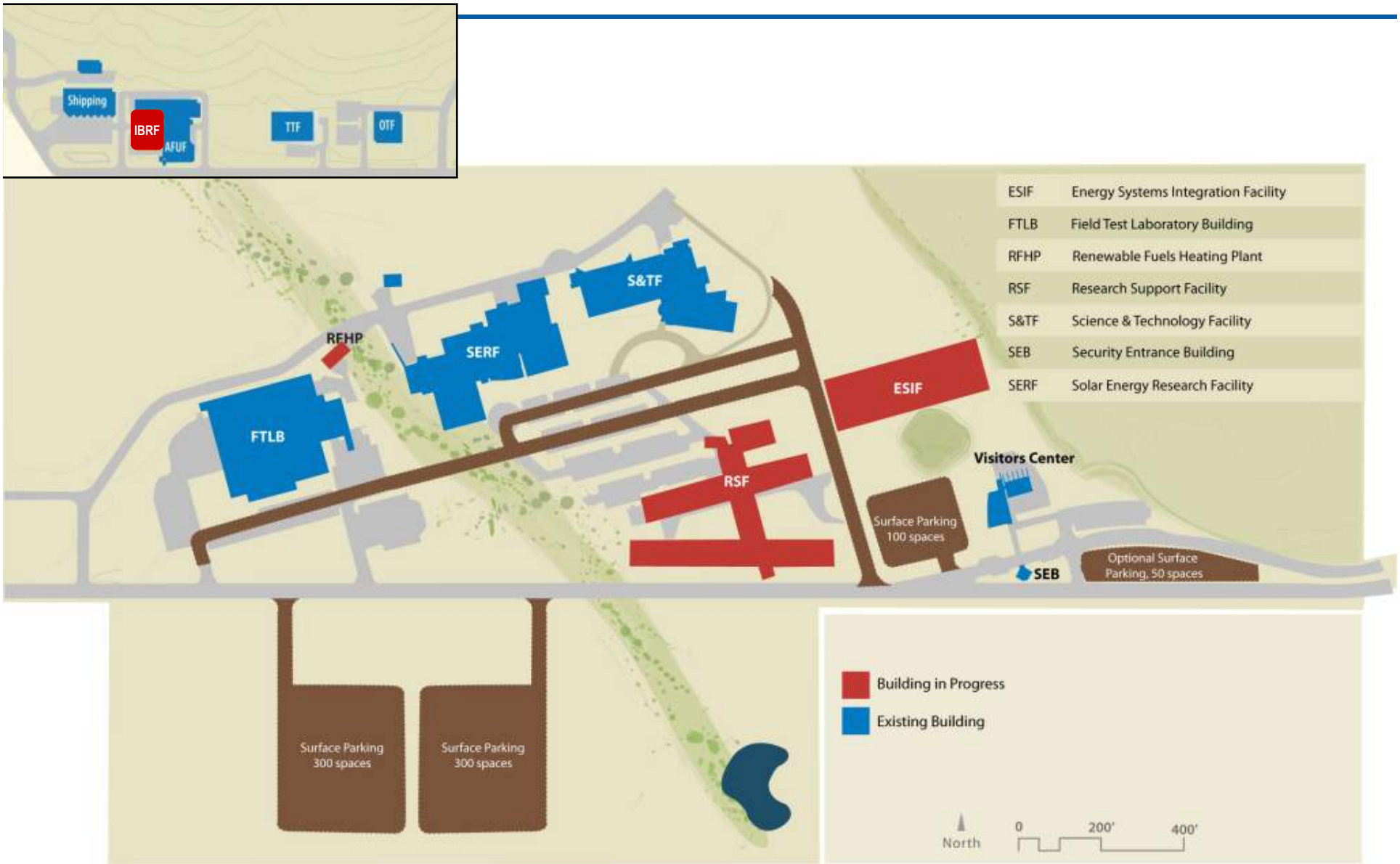


Updated March 2008

NREL Funding and Staffing



South Table Mountain Build Out Plan



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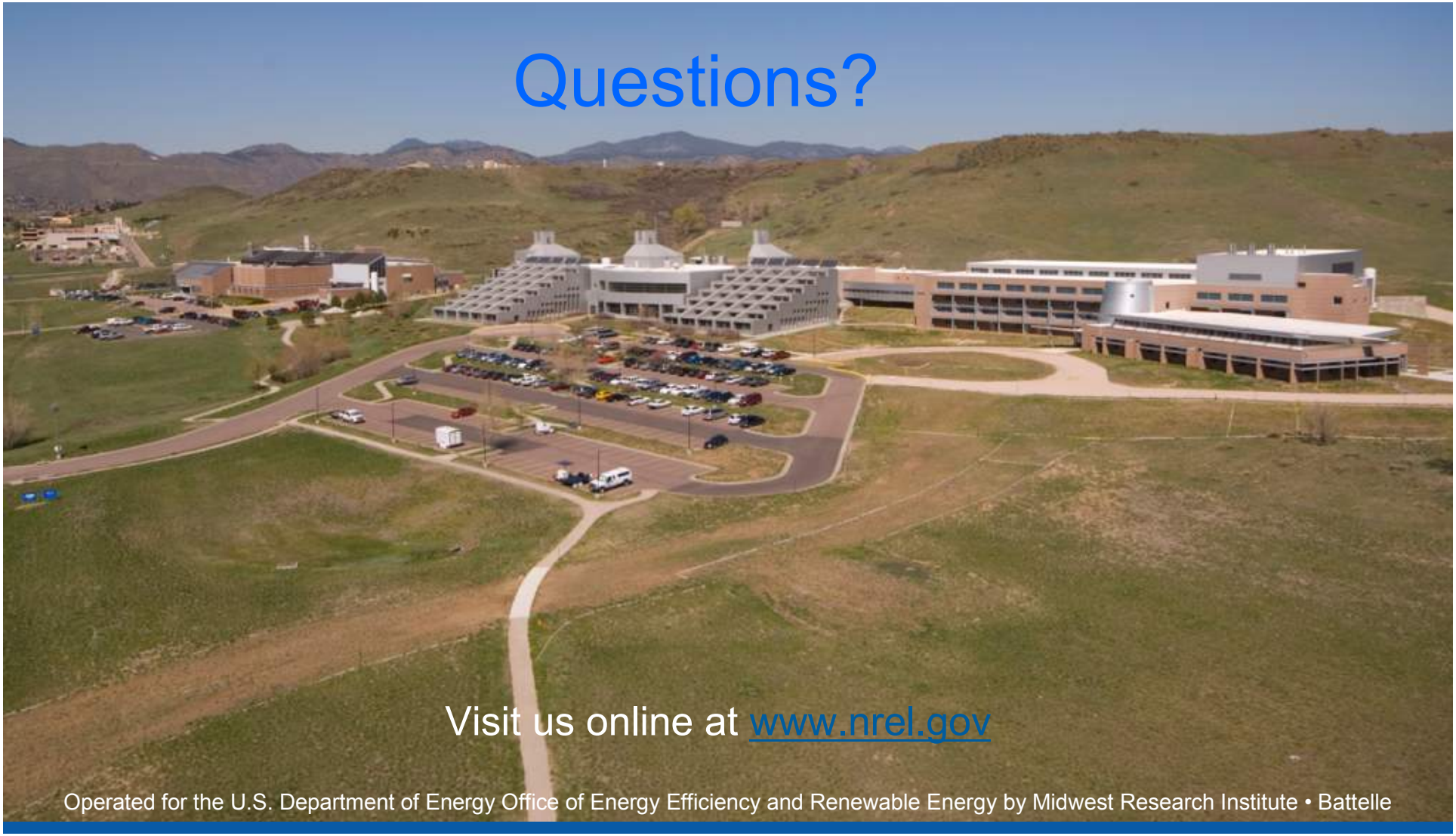
Questions?



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