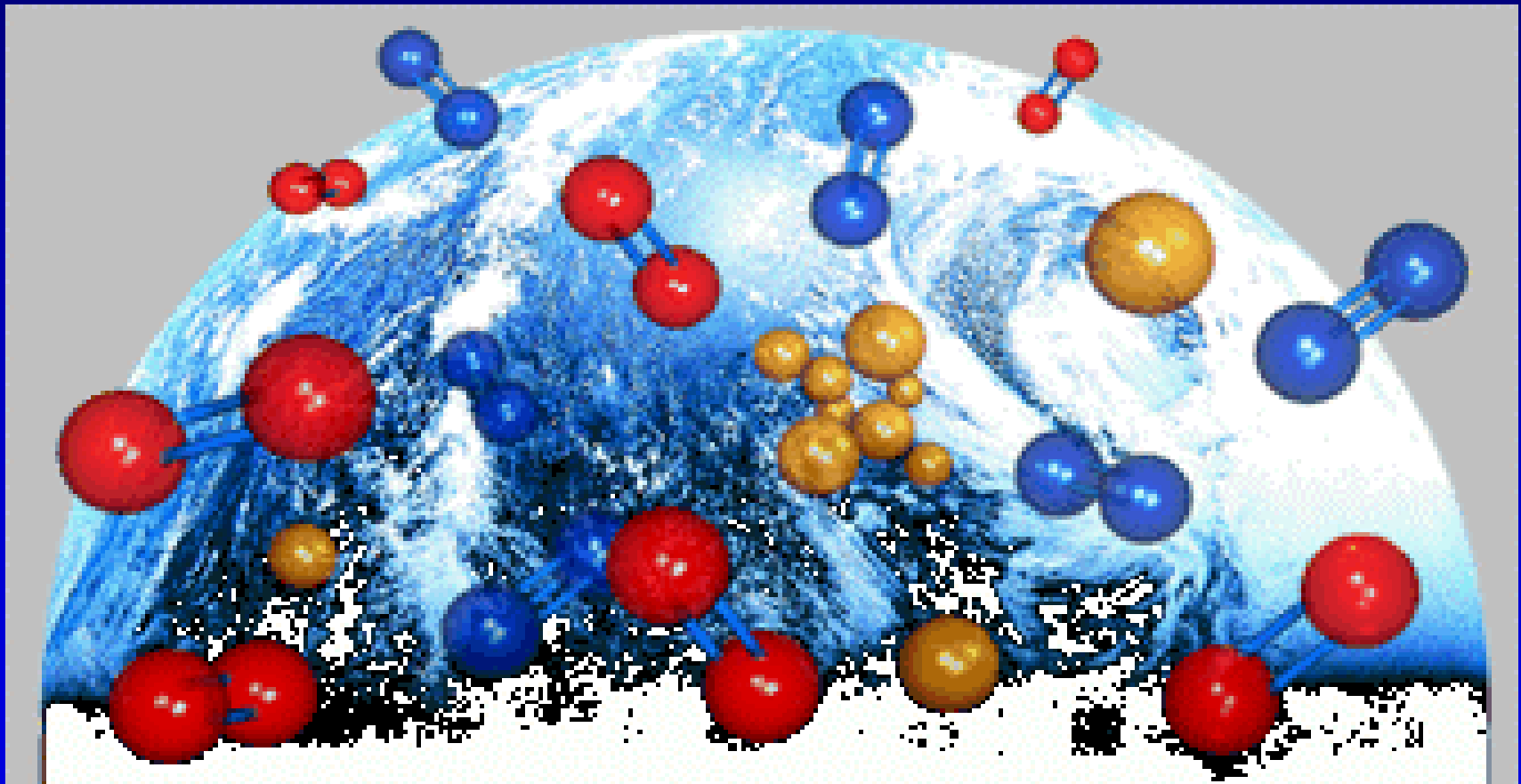


# **PRAXAIR**

Making Our Planet More Productive



# **Praxair at a Glance**

**Fortune 500 company – 2004  
sales of \$6.6 billion**

**One of the 3 largest industrial  
gases companies in the world;  
largest in No. & So. America**

**Operations in 40 countries**

**27,000 employees**

**One million customers**



# Products

## Atmospheric gases

- Oxygen, nitrogen, argon

## Process gases

- Hydrogen, helium, carbon dioxide, specialty gases



## Uses of Industrial Gases

---

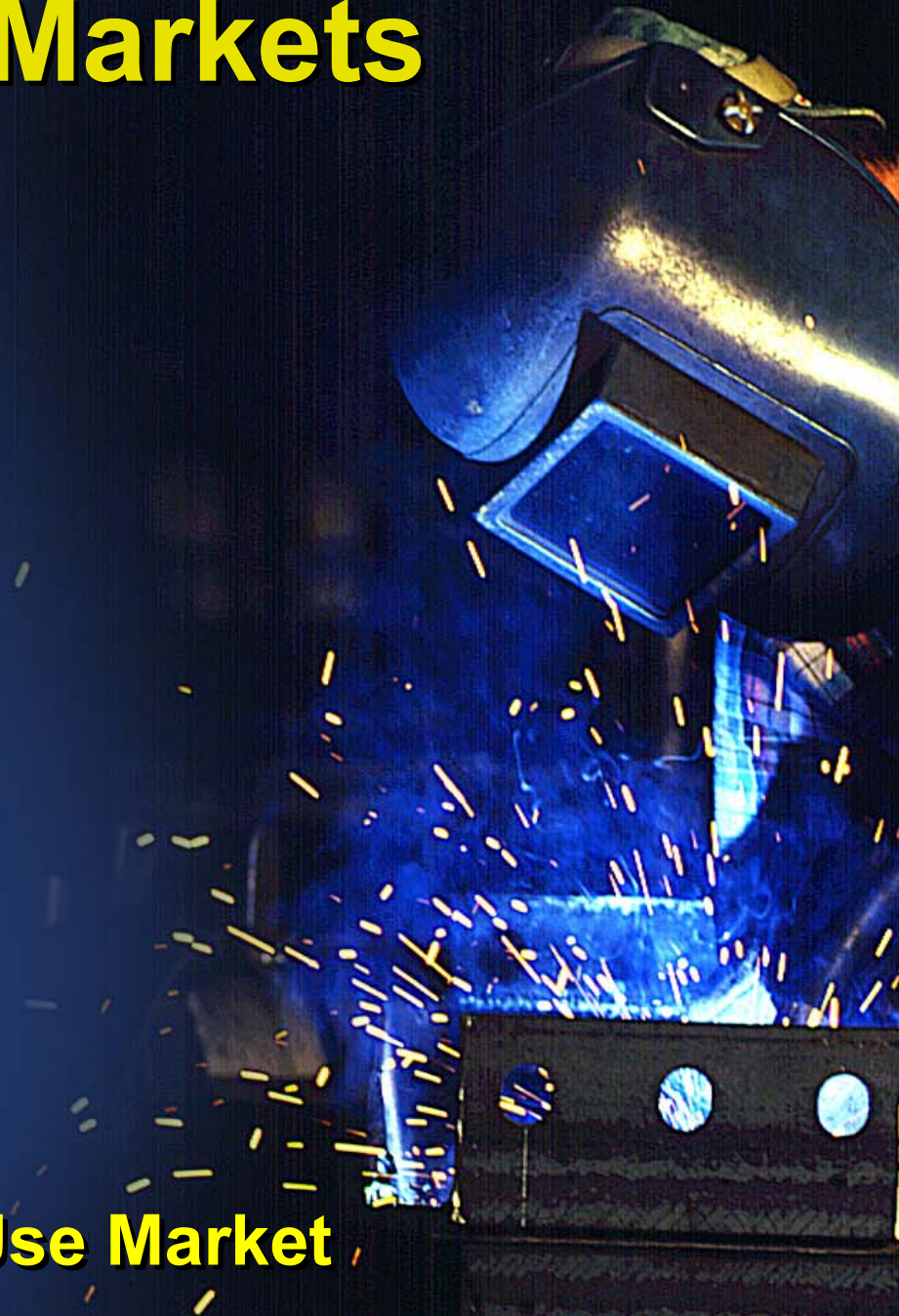
- Production
- Efficiency
- Capacity
- Quality
- Environmental



# Industrial Gases Markets

Aerospace	4%
Chemicals	11%
Electronics	8%
Energy	8%
Food & Beverage	9%
Healthcare	11%
Manufacturing	22%
Metals	15%
Other	12%

**Praxair Revenue \$ by End Use Market**





# Electricity Expenditures



Up to 75% of variable costs



# Air Separation

---

→ Filter It

→ Compress It

→ Cool It

→ Distill It

# Customer Categories

---

→ On-Site

→ Merchant

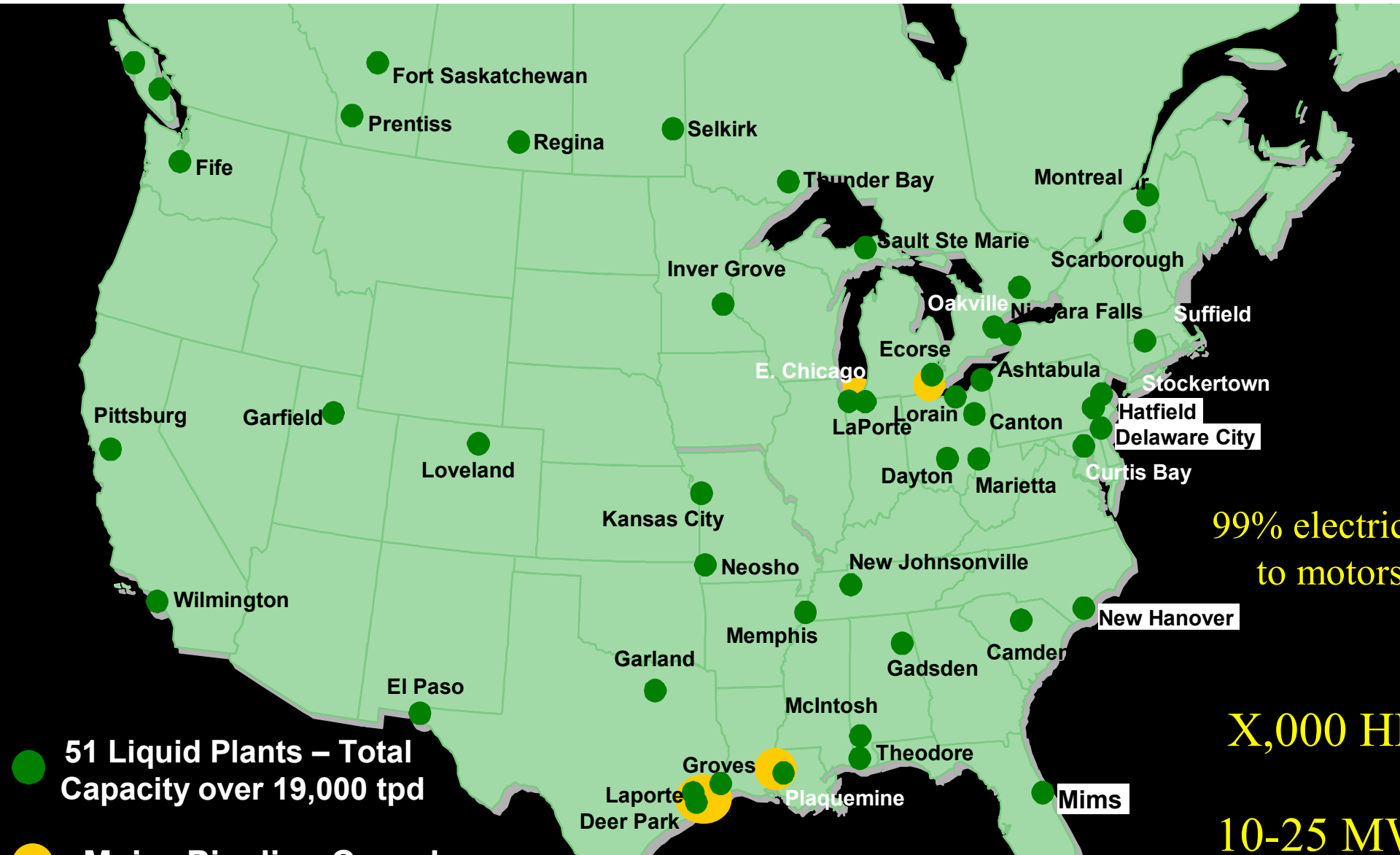
→ Package

Importance of Inventory



# PRAXAIR IN U.S. AND CANADA

## Merchant Plant Locations



# Development of Operating Flexibility

---

- Ability to Shut Down / w/o problems
  - Manage logistics, wear & tear
- Net Benefits

# Development of Operating Flexibility

---

- Ability to Shut Down / w/o problems
  - Manage logistics, wear & tear
- Net Benefits
- Rangeability

# Development of Operating Flexibility

- Ability to Shut Down / w/o problems
  - Manage logistics, wear & tear
- Net Benefits
- Rangeability
- Cultural Implementation Challenges
  - Originally widespread concerns
- Internal Coordination and Selling

# Enhanced Production and Sourcing

- Enhanced Technology Implementation
- Improved Inventory Metering / Management
- DR good time for Plant Maintenance
- Widespread Watts-Transducers / Telemetry



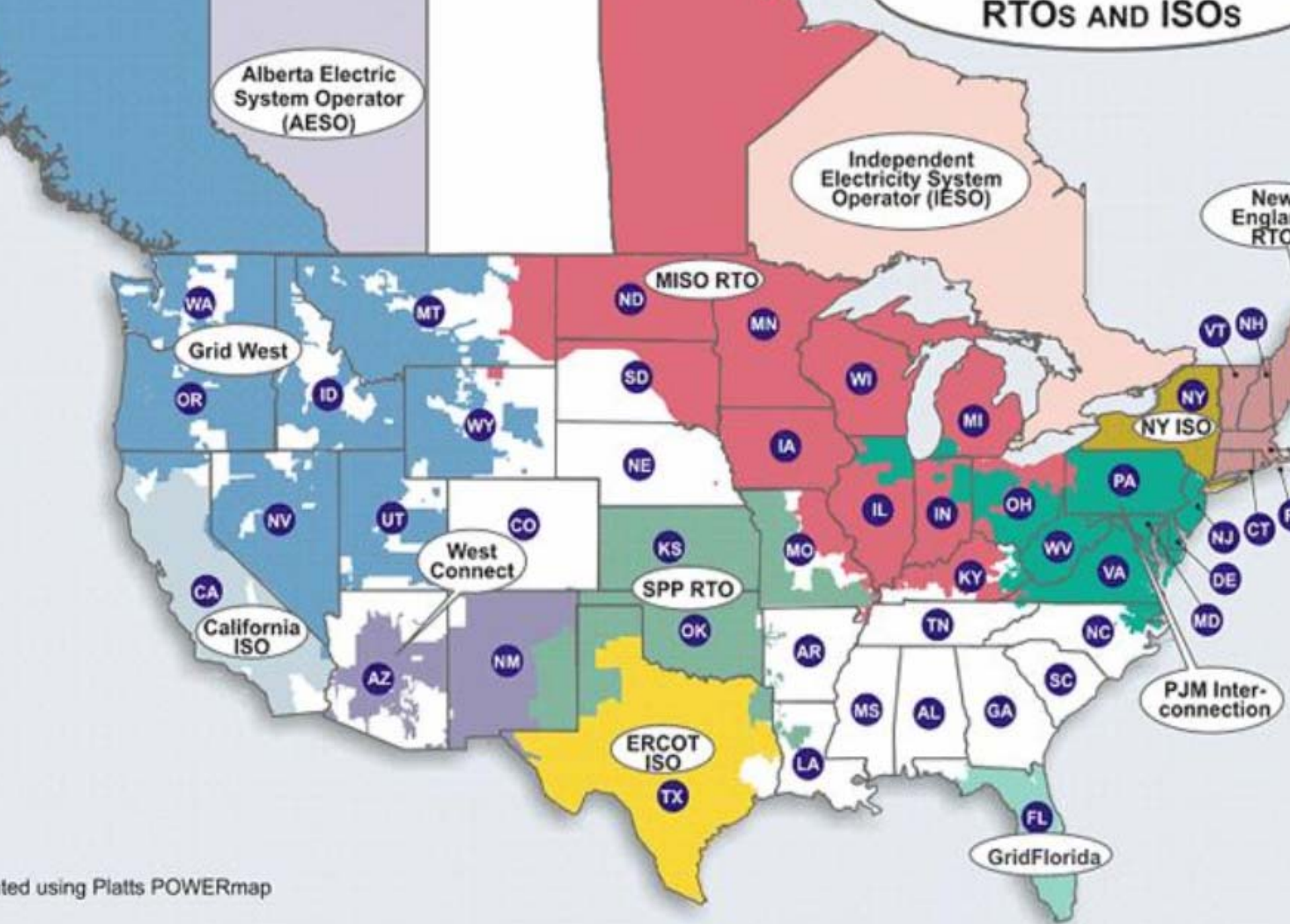
# Enhanced Production and Sourcing

- Enhanced Technology Implementation
- Improved Inventory Metering / Management
- DR good time for Plant Maintenance
- Widespread Watts-Transducers / Telemetry
- Centralized Management (w/plants) key
- Performance KPIs

# Enhanced Production and Sourcing

- Enhanced Technology Implementation
- Improved Inventory Metering / Management
- DR good time for Plant Maintenance
- Widespread Watts-Transducers / Telemetry
- Centralized Management (w/plants) key
- Performance KPIs
- Optimization Programs – Multi-cost/plants
  - Minimize Costs / Reliable Supply
  - TOU / Interruptible / DR considered
- Decision Support Systems / Advances
  - Improve planning, response, efficiency

# RTOs AND ISOs



# Demand Response Opportunities

→ Diversity of Experience

→ Goals for DR:

→ Should have all Opportunities of Generation

→ Should be Fairly Compensated

→ All Qualified Load should be Eligible

# DR should have all Opportunities of Gen to Provide Energy, Capacity, A/S

- One but not the Other (or none)
- Objections of Generators
- DR gets lower priority
- Talk but no action
  - Mentioned in tariff
  - Not integrated / compensated
  - Unreasonable requirements



# DR should be Fairly Compensated for its Economic and Reliability Value

- Minimum Prices and Durations
- No Generation Offsets
- Ease of Use / Automation
- Permanency / Incorporate in Tariff
- Maintain good existing programs
- Full value to Load / No stranded cost

# All Qualified DR Load should be Eligible

---

- Barriers to Entry
- Federal/State Regulatory Conflicts
  - “One hand clapping”
- Encourage DR where there is none
  - No DR need *and* no capacity avail ?!
- DR resource can serve multiple needs

# **PRAXAIR**

Making Our Planet More Productive

