

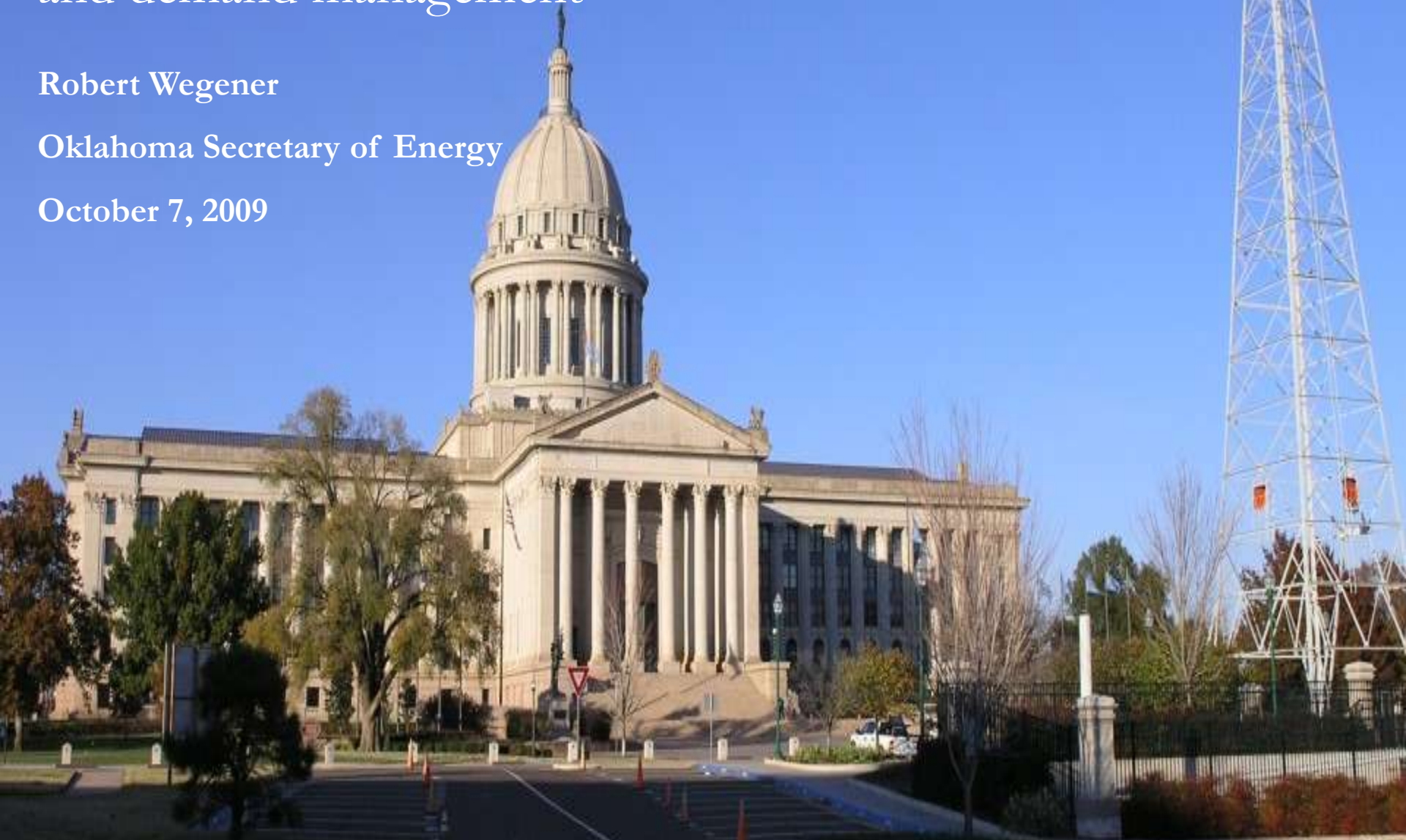
# OKLAHOMA'S FUTURE POWER SUPPLY

Partnerships between natural gas, renewables  
and demand management

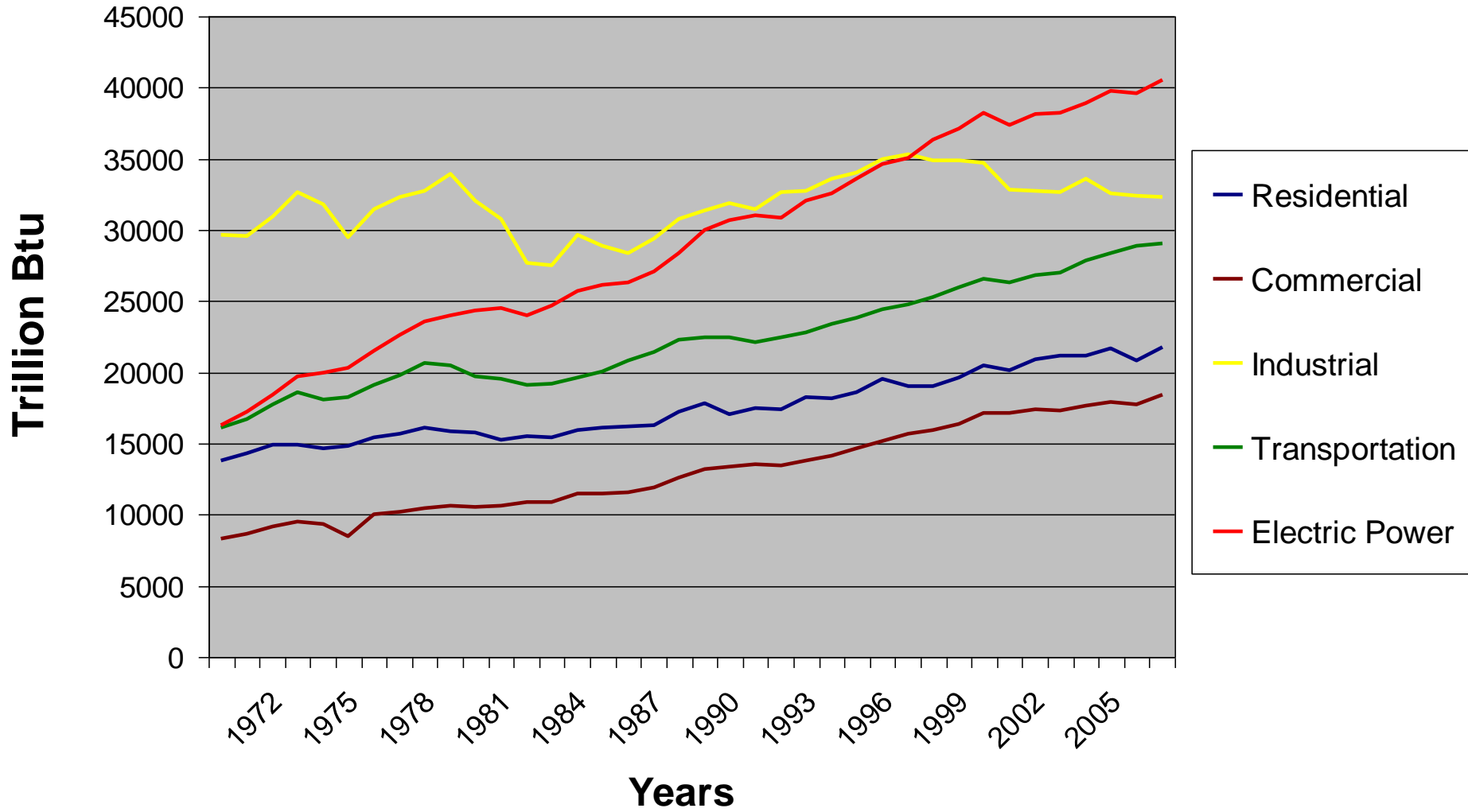
Robert Wegener

Oklahoma Secretary of Energy

October 7, 2009



# Energy Consumption by End Use Sector



Source: Energy Information Administration:  
2008 Annual Energy Review

# Thoughts from energy leaders...

***“We need more energy in all forms. ConocoPhillips strongly supports development of alternative and renewable sources, like solar, wind and geothermal power, biofuels, and others...We also need more fossil fuels – oil, natural gas and coal – as well as more nuclear power. Alternative energy cannot come on line fast enough at the scale required to replace these sources, not for decades to come.”***

-James J. Mulva

Chairman and CEO ConocoPhillips

January 13, 2009, National Press Club

***“Renewable energy and clean burning natural gas are the basis of a new strategy the world needs to create a cleaner and more secure future.”***

- T. Boone Pickens and Ted Turner

CEO of BP Capital and Chairman of Turner Enterprises Inc.

August 16, 2009

# Oklahoma Solutions to the Supply Debate

## OK Power Supply No-brainers

- Natural Gas
- Wind
- Geothermal
- Demand-side Management/Efficiency

What about coal and nuclear???

Clean

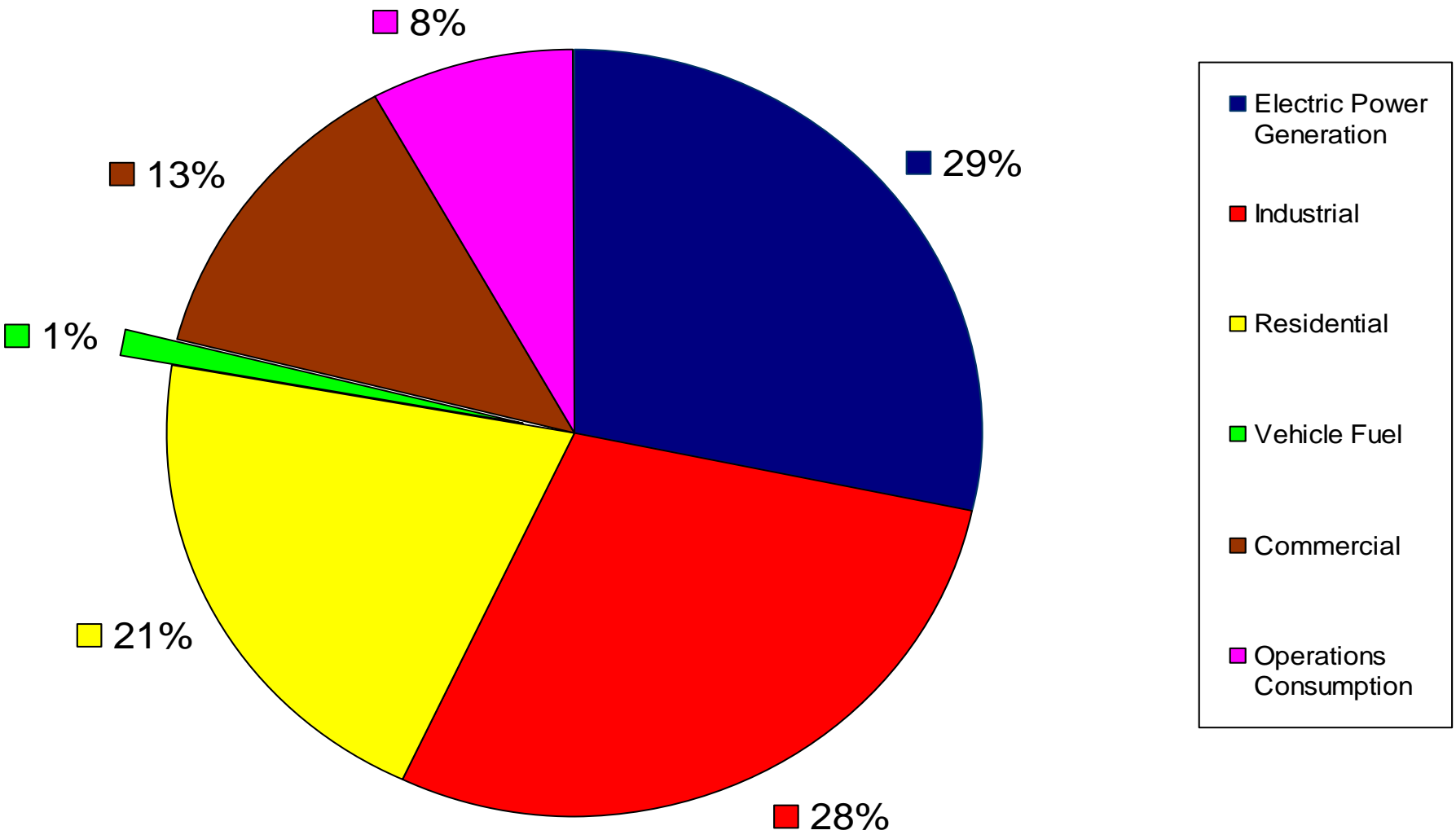
Domestic

Abundant

Underutilized



# U.S. End Uses of Natural Gas



Source: EIA

# Why Natural Gas?

- Abundant domestic supply supports increased utilization
- Cleanest Fossil Fuel Generation– 50% less CO<sub>2</sub> than coal
- Only available backup for renewable generation
- Challenges
  - Price Volatility Requires Hedges
  - Losing the policy battle in DC

# How to Win the Policy War

- Address the misconception that natural gas is scarce
- Agree that carbon emissions need to be reduced
- Encourage alternative energy development
- Embrace energy efficiency and demand programs

# Natural Gas Wins the Policy War and Rigs Stay Active



A perfect partner for natural gas?



# Oklahoma – Economic Impacts

from 1000 MW of new wind development

*Wind energy's economic "ripple effect"*

## Direct Impacts

### Payments to Landowners:

- \$2.7 Million/yr

### Local Property Tax Revenue:

- \$6.4 Million/yr

### Construction Phase:

- 1,800 new jobs
- \$189 M to local economies

### Operational Phase:

- 250 new long-term jobs
- \$21 M/yr to local economies

## Indirect & Induced Impacts

### Construction Phase:

- 1,650 new jobs
- \$141 M to local economies

### Operational Phase:

- 250 local jobs
- \$20 M/yr to local economies

## Totals

(construction + 20yrs)

**Total economic benefit = \$1.16 billion**

**New local jobs during construction = 3,500**

**New local long-term jobs = 500**



All jobs rounded to the nearest 50 jobs; All values greater than \$10 million are rounded to the nearest million

Construction Phase = 1-2 years  
Operational Phase = 20+ years

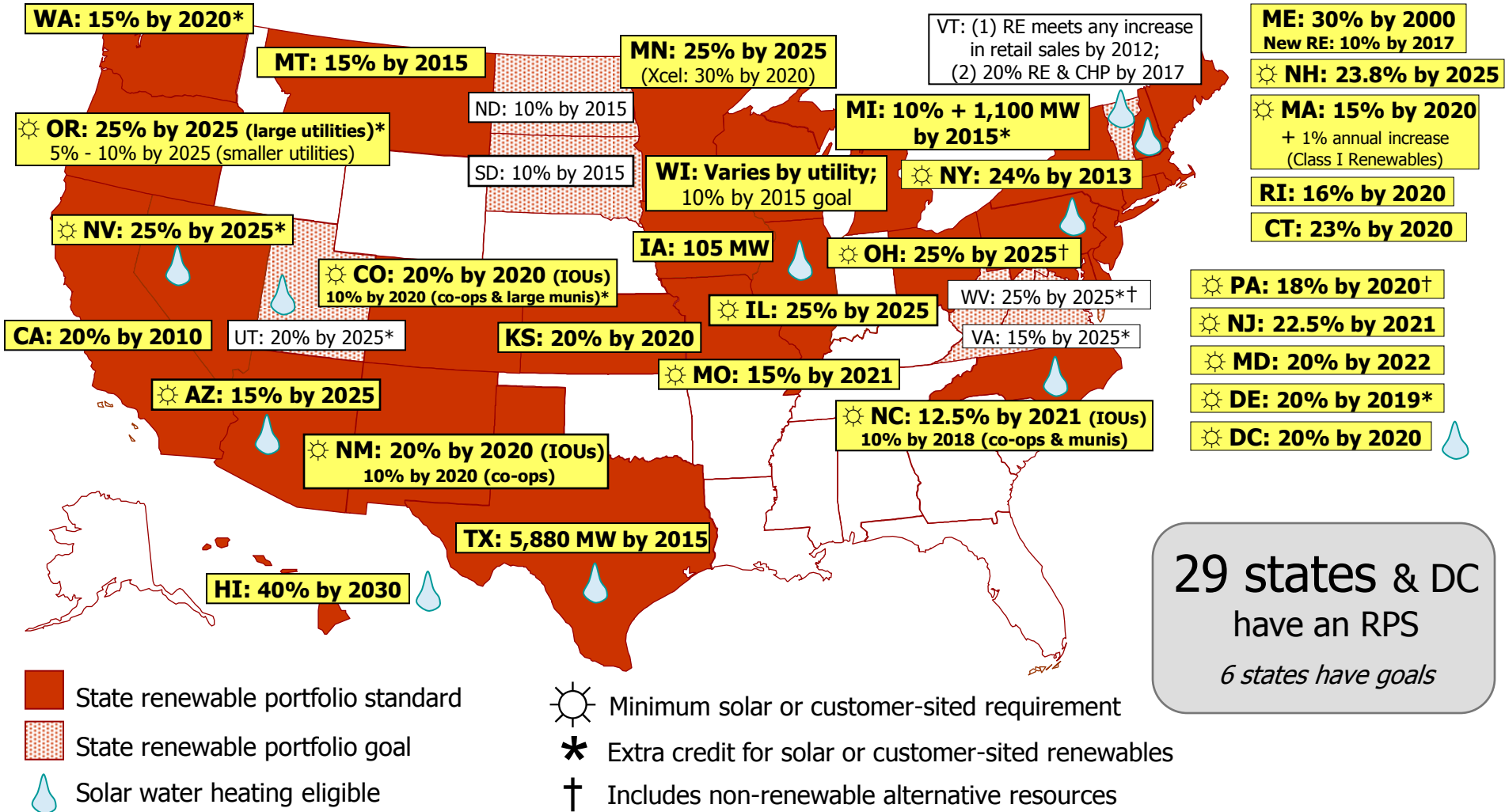
# Transmission is the Key

- No major improvements for 30 years
- Needed for renewables AND efficient, reliable, cost-effective baseload electricity
- Provide economic benefit like the interstate highway system

\$\$\$ Who Picks up the Tab \$\$\$

# Renewable Portfolio Standards

[www.dsireusa.org](http://www.dsireusa.org) / September 2009



# Geothermal Heat Pump Systems

... are the most energy-efficient, environmentally clean, and cost-effective space-conditioning system

... produce the lowest carbon dioxide emissions, including all source effects, of all available space-conditioning technologies

(U.S. EPA)

# Geothermal Heat Pumps Transfer Heat Efficiently

1 kWh of energy  
from the grid

Yields:  
4-6 kWh of energy  
for the building

Plus:  
3-5 kWh of energy  
from the earth

**400-600% Efficient**

# Geothermal Heat Pumps



Statue of Liberty Gift Shop



ASHRAE Headquarters - Atlanta, GA



Galt House Hotel - Louisville, KY



Black Point Inn - Prouts Neck, ME



Alta Condos, Washington DC



Harvard Library - Cambridge, MA



French Laundry Rest.- Napa, CA



Whistler Village - BC, Canada



Yale Art Bld. - New Haven, CT



Gaillardia Offices - Okla. City



California University of PA



Hirschfeld Towers - Denver, CO

## Commercial Buildings

Supply alone is not a sustainable solution to increased electric sector demand



# Why DSM and Efficiency?

- Hedge to natgas price volatility
- Cost of additional supply
  - 1000 mw nuclear: \$6 - 8 billion
  - 1000 mw coal: \$2.5 billion...and rising
  - Renewables are important, but they are intermittent

Policy must address the utility disincentive

# Summary

- Oklahoma's future power supply should be based on partnerships between natural gas, renewables and demand-management
- Natural Gas proponents must acknowledge that hedges are needed to protect customers from price volatility
- Policy support for wind and geothermal will generate economic development AND protect the electric generation market for natural gas
- Demand-management must be considered with traditional supply-side options

# What is Needed

- Long-term strategic plan (systems not lines)
- Develop Cost Allocation Methods
- Develop Cost Recovery Methods

# How Do We Get There

- Unite efforts of feds, regional planners and state policy makers
- Direction and leadership from feds – make some key decisions to provide certainty
- Strong federal stick
  - Regional planners can get the job done, but FERC must have authority to stimulate action if regional process fails or needs help