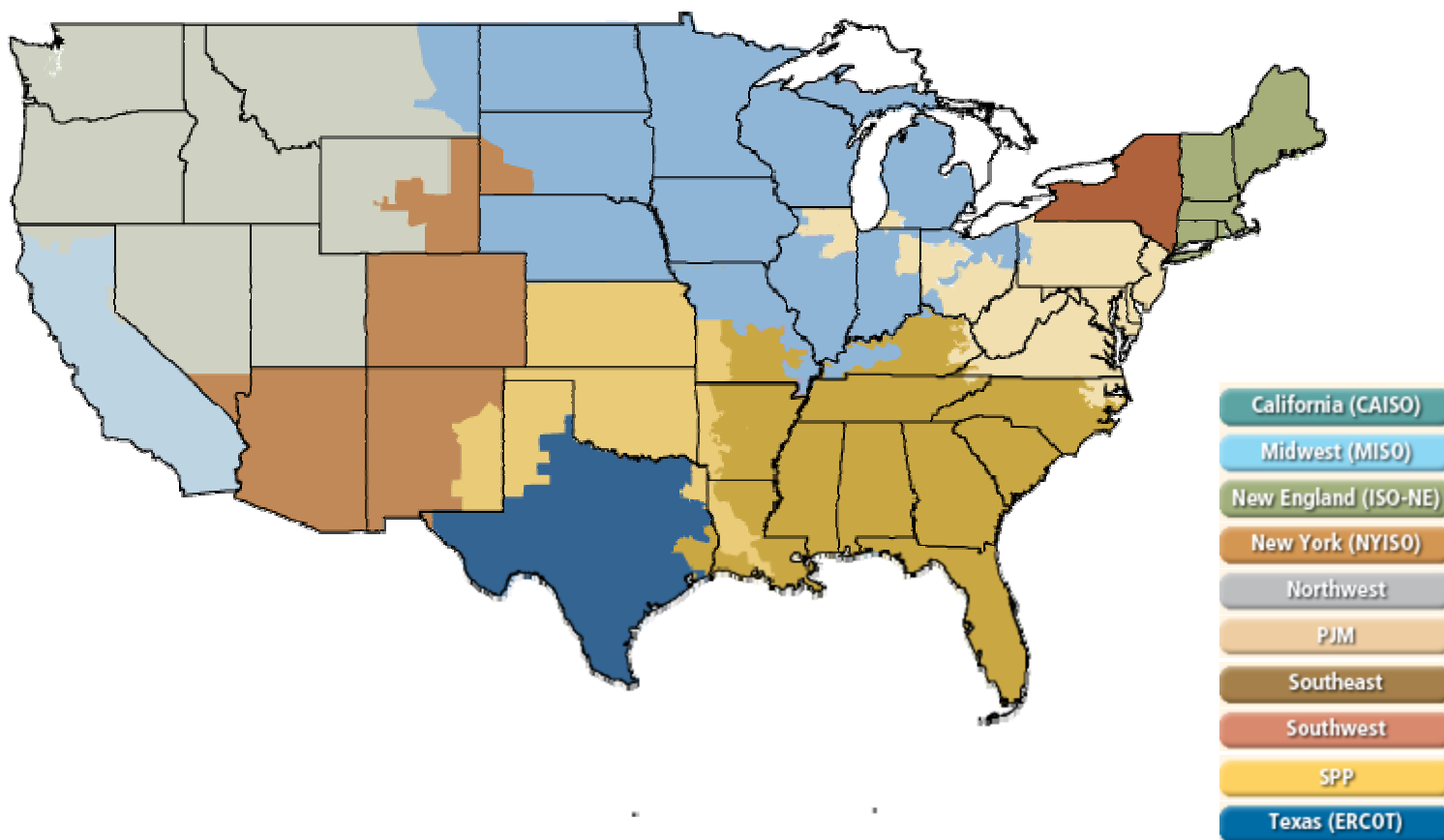
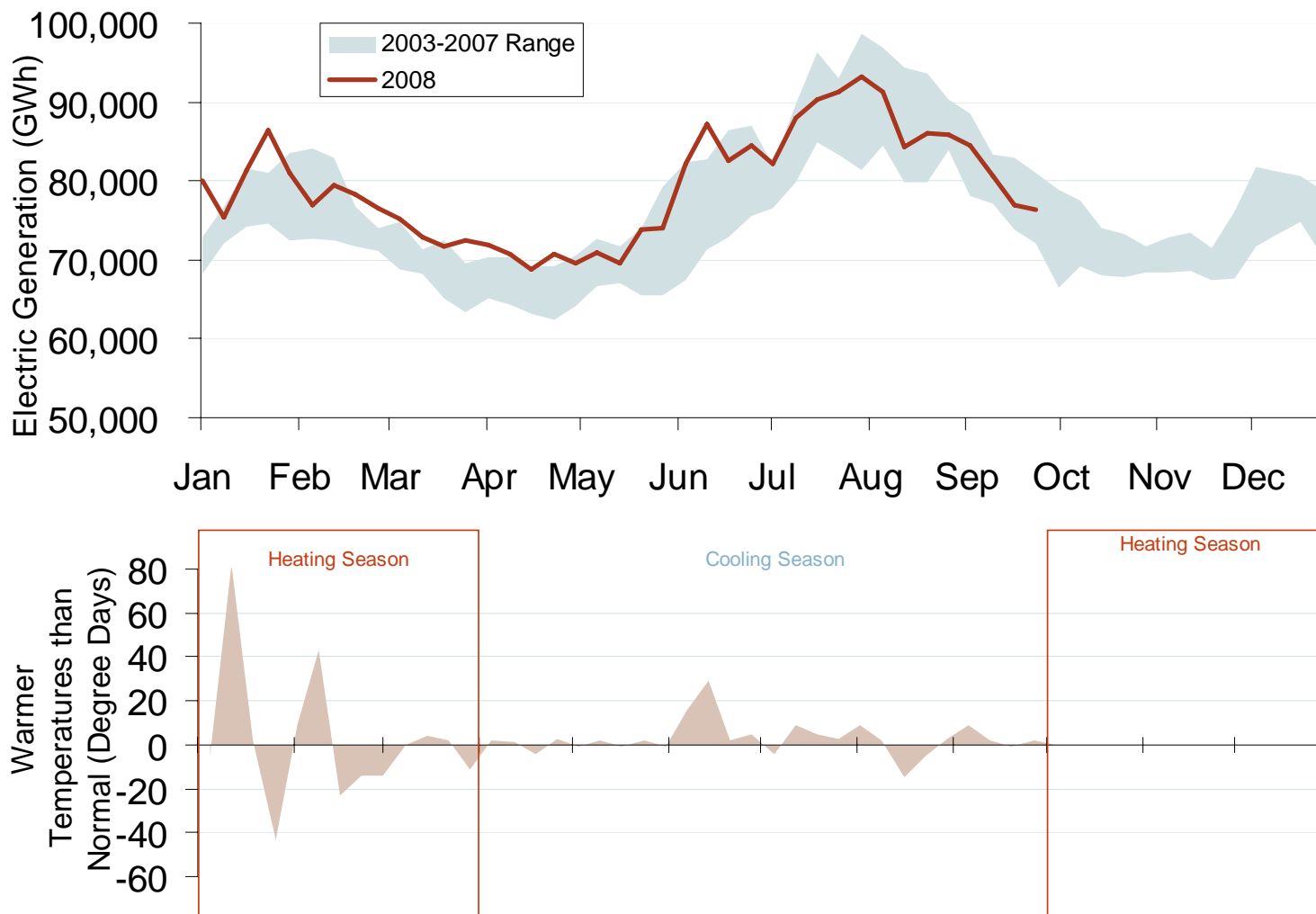


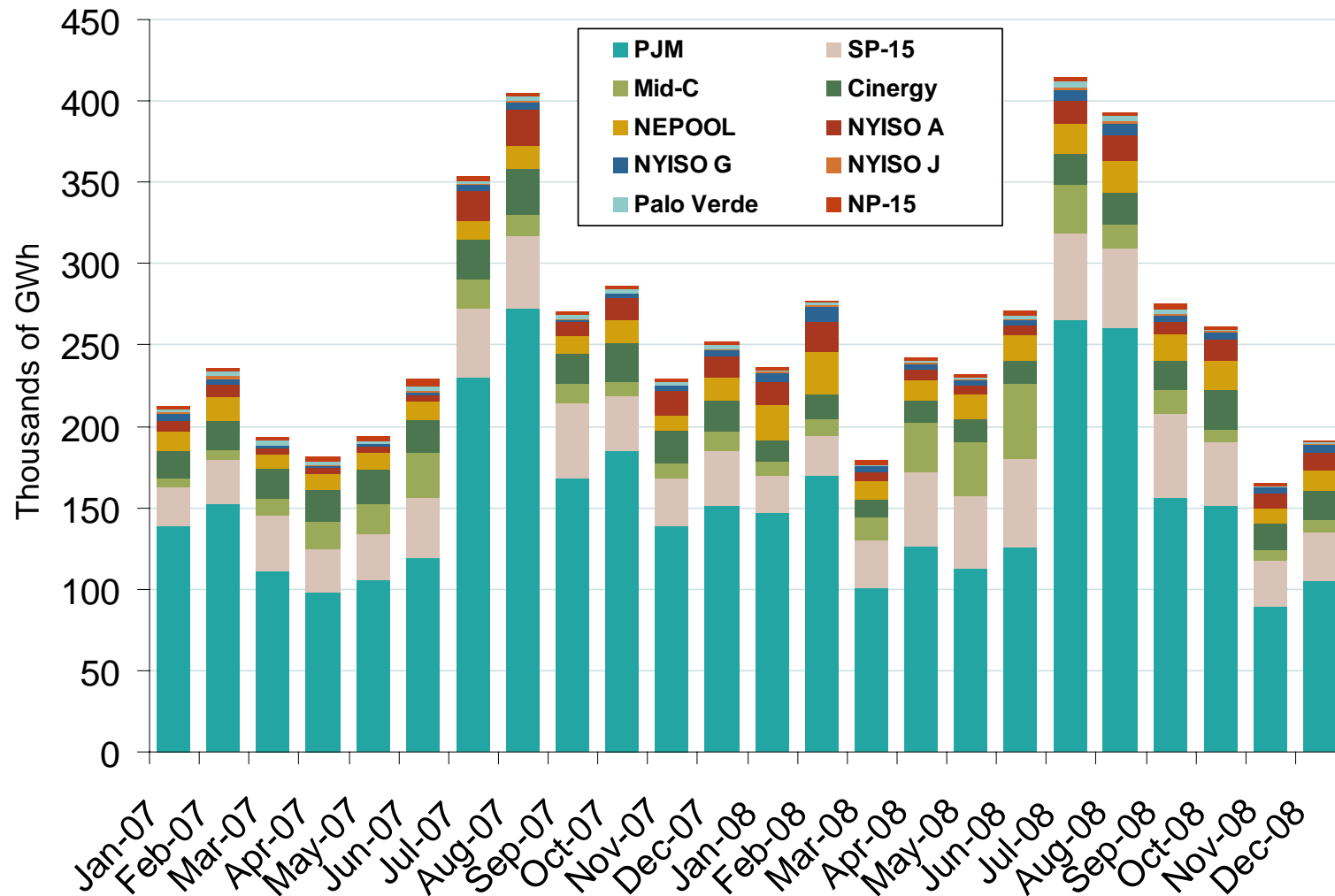
Electric Market National Overview



Weekly U.S. Electric Generation Output and Temperatures

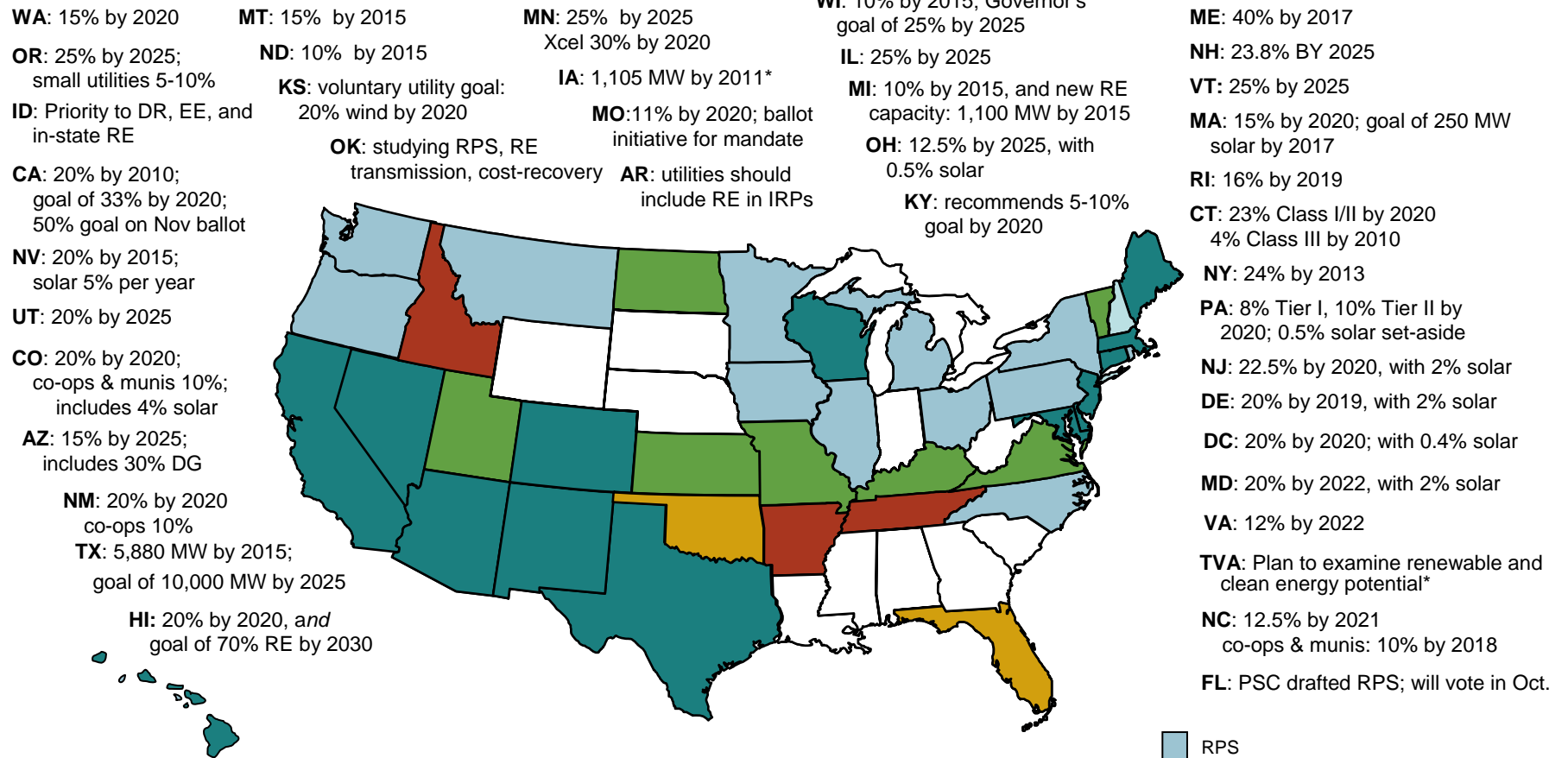


Financial Trading on ICE



Source: Derived from ICE data. ICE on-peak swaps (financial) volume include monthly, dual monthly, quarterly, and calendar year contracts traded for each month.
October 2008

Renewable Energy Portfolio Standards (RPS)



Updates at: <http://www.ferc.gov/market-oversight/mkt-electric/overview/elec-ovr-rps.pdf>

Notes: Alaska has no RPS; * Iowa has a goal of 1,000 MW of wind by 2010; TVA's "Renewable Energy and Clean Energy Assessment" is from the Public Power Authority; it is not a state policy.
Abbreviations: DG: distributed generation; DR: demand response; EE: energy efficiency; IRP: integrated resource plan.
Sources: Derived from data in: EEI, EIA, LBNL, PUCs, State legislative tracking services, Database of State Incentives for Renewables and Efficiency, and the Union of Concerned Scientists.

- RPS
- Strengthened/ amended RPS
- Voluntary standards or goals
- Proposed RPS or studying RPS
- Other renewable energy goal

Renewable Energy Portfolio Standards

- **A Renewable Portfolio Standard (RPS)** requires a percent of energy sales or installed capacity to come from renewable resources.
- **27** states, including D.C., have renewable energy standards.
- Recent state policy developments include:
 - **Michigan's** House and Senate reconciled their renewable and energy efficiency standard bills, enacting an RPS in September. The RPS includes both a capacity portfolio, and a renewable energy credit portfolio. The former targets 1,100 MW of new renewables (after Jan 2008). The credit portfolio, and a They were sent to a conference committee in July; there has been no further action.
 - **Florida** issued a draft RPS for comment in August, on which the PSC Commissioners will at the October meeting. Florida's bill, passed in April, directed the PSC to draft an RPS. Once approved at the PSC, it must be submitted to the legislature by Feb 2009 for ratification.
 - **TVA** (Tennessee Valley Authority), the nation's largest public power authority, adopted a "Renewable Energy and Clean Energy Assessment" in May. More like a roadmap, it will review TVA's generation mix to identify opportunities to add renewable and clean energy to its mix in a cost-effective way over three time horizons. This is not a Tennessee law or regulation.
- **Six** states have renewable goals without financial penalties: UT, ND, KS, MO, KY, VA, VT.
- **Thirteen** states include energy efficiency in their RPS or renewable goals; more are considering energy efficiency additions or companion bills.
- **DOE awarded \$6.6 million** in energy efficiency and renewable energy grants in September. Notable renewable projects include:
 - **South Carolina** will use its \$492,648 to study and overcome barriers to clean coastal energy development for wave, tidal, and wind projects. The grant will also be used to establish a SC Coastal Clean Energy Regulatory Task Force.
 - **Hawaii** received \$500,000 to establish a policy framework for renewable energy for grid infrastructure for Oahu, where more than 80% of its population lives. It plans use the grant to develop policies including smart grid technologies, electric storage, transmission and delivery technologies, and innovative demand response.
 - **Colorado's** \$397,000 will help it address key barriers and incentives for building transmission capacity for renewable energy.

Energy Efficiency Resource Standards (EERS)

ID: Energy Plan puts conservation – DR and EE – as priority resource

MT: state agency reduction initiative: save 20% by 2010

MN: reduce fossil fuel use 15% by 2015 through EE, RE

IA: utilities must establish EE goals by end of 2008

MI: annual incremental savings: 1% of prior year's sales by 2012

IL: reduce energy 2% by 2015 (EE) and 0.1% from prior year (DR)

ME: 10% new EE by 2017; in RPS goal as 2nd priority

VT: EE & RE to meet 2007-12 growth; new EE fund

WA: must pursue all cost-effective conservation

OR: IOUs required to have EE in IRP & assess cost-effectiveness

CA: IOUs reduce MW 10%, peak demand (MWh) 12% by 2013; munis 10% by 2017

NV: use EE for up to 25% of RPS by 2015

UT: EE incentives in RPS goal

CO: save 40 MW and 100 GWh annually to 2013

NM: use EE and DR to save 10% of 2005 retail electric sales by 2020

KS: studying for E&G utilities

OK: PSC approved quick-start DSM programs, including EE

TX: 10% of load growth, beyond 2004, based on prior 5 years

HI: 20% of MWh sales by 2020; up to 50% of RPS

WI: RPS requires utility EE

OH: reduce peak-demand 8% by '18; 22% energy savings by '25

PA: new funding for EE and RE

MA: meet 25% of capacity and energy with DSR by 2020

NY: 15% electric use reduction by 2015; doubles EE funding

CT: 4% savings by 2010; a Tier III RPS resource

NJ: reduce consumption 20%, and reduce peak 5,700 MW by 2020

DE: EE, RE, DG, and DR are priority resources before new gen

DC: Sustainable Energy Utility charged with reducing peak-demand and energy consumption

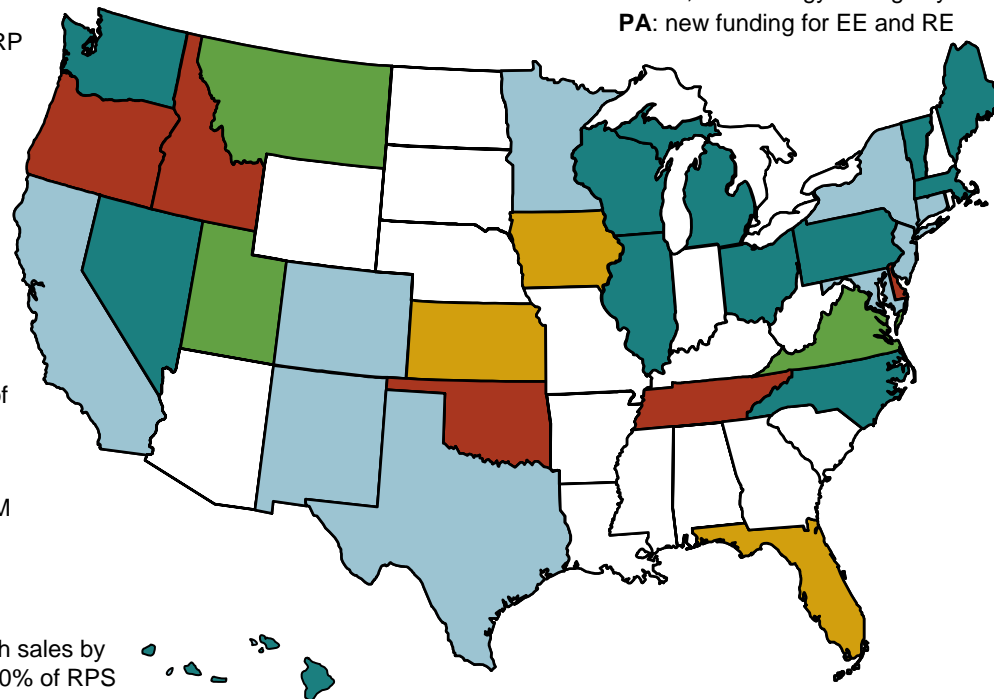
MD: reduce peak-demand and per cap electricity use 15% by 2015

VA: reduce 10% of 2006 sales by 2022 with EE, DR

NC: EE to meet up to 25% of RPS to 2011; later to 40%

TVA: reduce peak demand 1,400 MW by 2012 with EE, DR *

FL: PSC to adopt goals to reduce electric consumption, peak demand



- EERS by regulation or law (separate from RPS)
- Energy efficiency part of an RPS law, rule, or goal
- Voluntary standards (in or out of RPS)
- Energy efficiency goal proposed / being studied
- Other energy efficiency or demand-side rule or goal

Updates at: <http://www.ferc.gov/market-oversight/mkt-electric/overview/elec-ovr-eeps.pdf>

* TVA's "EE and DR Plan" is from the Public Power Authority, and is not a state policy.

Abbreviations: CHP – Combined heat & power; DG – distributed generation; DR - demand response; DSM - demand side management; DSR – demand-side resources; EE - energy efficiency; E&G: electric and gas utilities; IRP – integrated resource plan; RPS: Renewable Portfolio Standard

Sources: ACEEE, EPA, Regulatory Assistance Project, Union of Concerned Scientists, State regulatory and legislative sites, trade press

Energy Efficiency Resource Standards (EERS)

- An **EERS** – energy efficiency resource or portfolio standard – aims to reduce or flatten electric load growth through energy efficiency (EE) measures. Goals may specify reductions in energy (MWh), demand (MW), or both. Many specify both overall energy reductions and peak-load reductions.
- **Twenty-three** states have an EERS or goal; at least fifteen include EE as part of a renewable standard or goal.
- States that enacted significant energy efficiency legislation in 2008 include: DC, FL, IA, MA, MD, MI, NJ, NM, NY, OH, OK, UT, and VT.
- The **Tennessee Valley Authority** (TVA), the nation's largest public power authority, adopted an "Energy Efficiency and Demand Response Plan" in May. Its first goal is to reduce peak demand 1,400 MW by 2012. Although the plan is not a state rule or law, TVA's efforts could reduce energy demand in a large part of the Southeast.
- States that intend to use part of the RGGI auction proceeds to promote energy efficiency include CT, DC, DE, MA, and MD.
- Decoupling profits or revenues from the sale of kilowatts or therms (gas) is one incentive for utilities to encourage energy efficiency.
- Some states mandate or encourage decoupling for electric utilities; others rejected it. They include (but may not be limited to):
 - **California**, which has one of the oldest decoupling rules for electric and gas utilities.
 - **Connecticut's** utilities must include EE in rate cases after 2007.
 - **Idaho's** 2007 Energy Plan recommended the use of decoupling as an incentive.
 - **Kentucky** said decoupling has been insufficiently studied to adopt yet (July).
 - **Maryland** approved a mechanism for the state's largest utilities that decoupled rates (2007).
 - **Massachusetts'** DPUC opened an investigation into decoupling to promote EE as stipulated in the Green Communities Act (July).
 - **Michigan's** energy efficiency legislation (Sept) encourages shareholder incentives, and includes decoupling for gas utilities (but not electric).
 - **North Carolina's** Utility Commission issued a report to the Governor analyzing potential policies. It recommended against decoupling until EE incentives in SB3 (the RE and EE Standard) are understood (Sept).
 - Some of the states which have decoupling mechanisms for gas utilities are studying them for electric utilities.

Abbreviations: CHP – Combined heat & power; DR - demand response; DSM - demand side management; DSR – demand-side resources; EE - energy efficiency; RPS - Renewable Portfolio Standard; SEU - Sustainable Energy Utility

Collaborative Greenhouse Gas (GHG) Programs

Collaborative Regional GHG Programs:

- Groups with goals to lower regional GHG emissions were initiated by Governors at three area Governor Association meetings.
- Each has Participating (or Partner) U.S. states and Canadian provinces.
- Observer jurisdictions do not commit to group GHG reduction goals, but participate in proceedings should they opt to join later.

Western Climate Initiative (WCI):

- Created February 2007
- Partners: 7 states, 4 provinces; Observers: 5 states, 1 province*
- WCI announced its design for a market-based, *multi-sector* cap-and-trade program, Sept 2008:
 - 15% CO₂ reduction below 2005 levels by 2020
 - Phase I to take effect Jan 2012

Midwest Greenhouse Gas Accord:

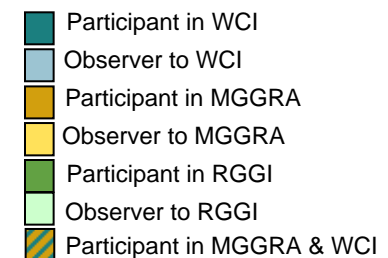
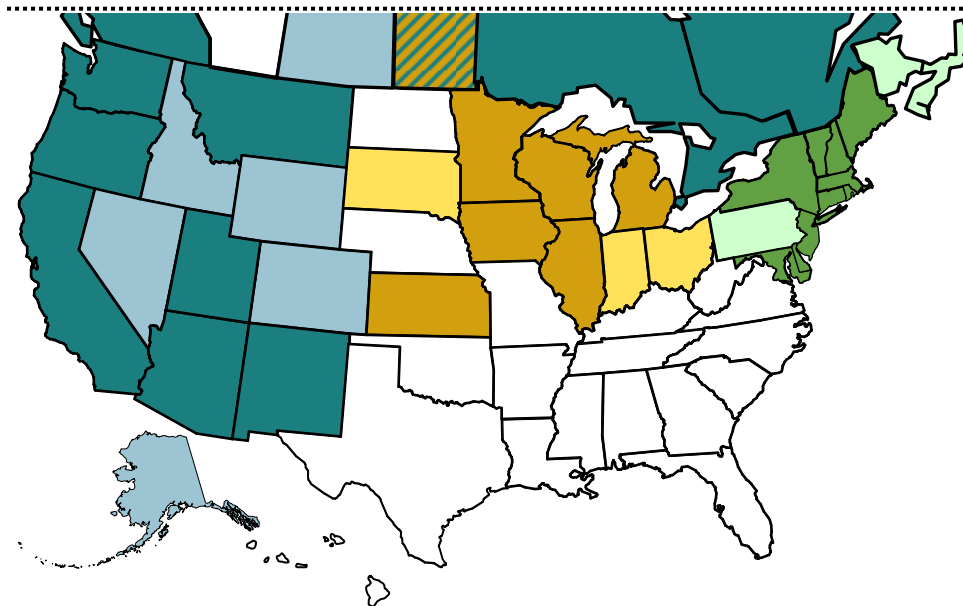
- Established November 2007
- Participants: 6 states, 1 province; 3 Observer states, 1 province
- *Preliminary* GHG policy recommendation: 15 – 25% reductions by 2020

Regional Greenhouse Gas Initiative (RGGI):

- Takes effect Jan 2009; est. Dec 2005
- 10 Participant states; Observers: 1 state, D.C., 3 provinces.
- Market-based effort to cap and reduce *power-sector* CO₂ emissions.
- 10% CO₂ reduction by 2018 covers over 200 plants
- 188 million allowances to be auctioned through 6 auctions

Auctions:

- 1. 9/25/08:** 12.5 mil. tons of allowances cleared at \$3.07/allowance, raising \$38.5 million.
 - 6 states each auctioned 1/6 of their allowances: CT, MA, ME, MD, RI, VT
 - these 6 will offer 16.6% at next 5 auctions
- 2. 12/17/08:** first 6 states plus NY, NJ, NH, DE: new states auction 20% in 5 auctions. 31.5 allowances in auction
- 3 to 6:** All ten states on same percent basis as prior auctions. 2009 dates: 3/18, 6/17, 9/16, 12/16



Updates at: <http://www.ferc.gov/market-oversight/mkt-electric/overview/elec-ovr-ghg.pdf>

Notes: Kansas is a MGGRA participant and WCI observer. Ontario is a Partner to WCI and MGGRA Observer.
Sources: Regional initiatives: www.rggi.org, www.midwesternaccord.org, www.westernclimateinitiative.org, trade press, Pew Center.

Collaborative Greenhouse Gas Programs

Regional Greenhouse Gas Initiative (RGGI):

- First U.S. mandatory cap-and-trade program for CO₂ emissions and targets only *power plants*
- Established Dec 2005. Takes effect January 1, 2009
- Cooperative effort by northeastern states to reduce CO₂ emissions:
 - Participants: CT, DE, ME, MD, MA, NH, NJ, NY, RI, VT
 - Observers: PA, D.C., and 4 Canadian provinces.
- Allowances will be auctioned, not allocated, although sources may trade allowances. One allowance is the right to emit 1 ton of CO₂.
- States' allowance shares apportioned from overall cap.
- By law, at least 25% of auction proceeds must support consumer benefit programs such as renewable energy, energy efficiency, or low-income energy assistance. In fact, 4 states will so allocate 100%; the rest at least 75%.

Midwest Greenhouse Gas Accord:

- Signed Nov 2007 at Midwestern Governors Association Energy Summit to establish emission reduction targets consistent with members' policies.
 - Participants: IA, IL, KS, Manitoba, MI, MN, WI
 - Observers: IN, OH, Ontario, SD
- GHG working group *preliminary recommendations (7/08)*:
 - cap and trade should cover *electric power and large industrials* – slightly less than half of regional emissions
 - regional targets from 2005 levels:
 - 15-25% reductions by 2020
 - 60-80% reductions by 2050
 - recommendations subject to modeling outcomes conducted by ICF on costs and other impacts of cap-and-trade under different scenarios, including complementary policies in sectors outside the cap.

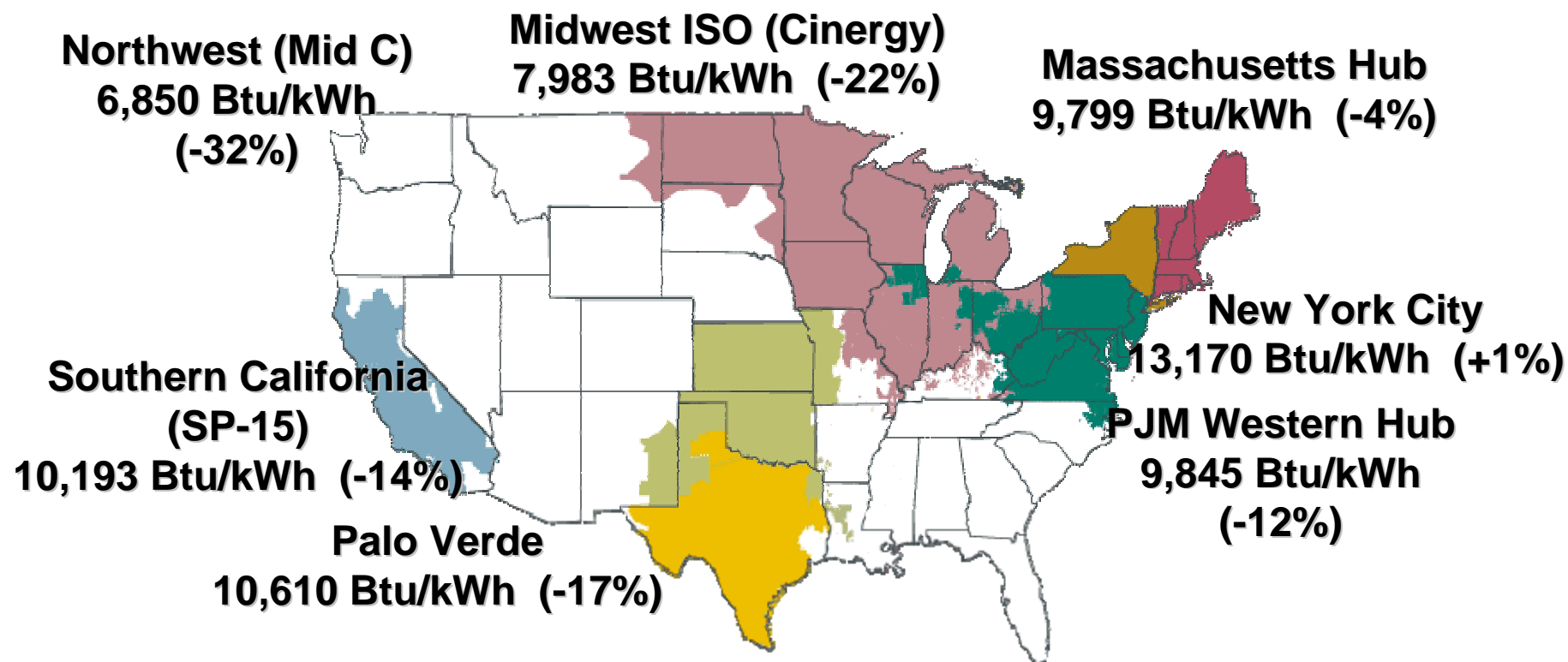
First RGGI auction, September 25, 2008:

- Six participating states each auctioned 1/6 (16.6%) of allowances: CT, MA, ME, MD, RI, VT.
- All 12,565,387 million tons offered were sold at a clearing price of \$3.07 per allowance, raising \$38,575,783 participating states.
- The auction was administered by World Energy Solutions and overseen by an Independent Market Monitor, Potomac Economics.
- 59 entities from the energy, financial and environmental sectors participated, demanding four times the number of allowances offered.
- Auction timing: two pre-compliance auctions in 2008, four quarterly auctions in 2009. There will be quarterly auctions in subsequent years.
- NY and NJ will begin participating in auction 2; NH and DE will participate in auctions 3 – 6.

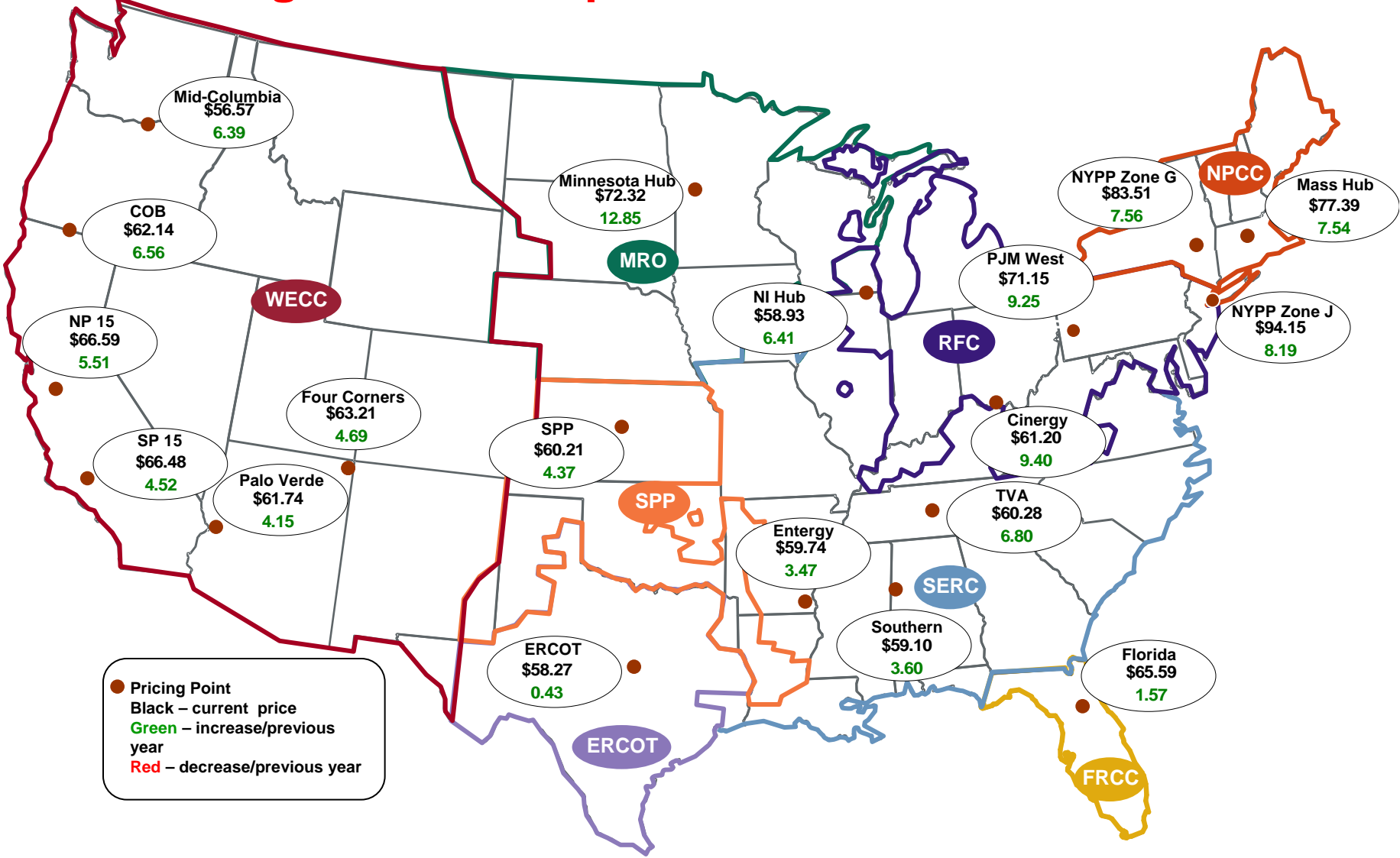
Western Climate Initiative (WCI):

- Launched by Western Governors Association Feb 2007 to reduce regional GHG collectively and cooperatively.
- Partners: seven U.S. states and four Canadian provinces: AZ, British Columbia, CA, Manitoba, MT, NM, Ontario, OR, Quebec, UT, WA
- Observers: AK, CO, ID, NV, Sask., WY
- Sept 2008: WCI announced design for a market-based, *multi-sector* cap-and-trade program
 - 15% CO₂ reduction below 2005 levels by 2020
 - Covers 90% of regional emissions
 - Phase I to take effect Jan 2012
 - Phase II will begin 2015

June-August Implied Heat Rates, 2008 vs. 2007



Average On-Peak Spot Electric Prices 2006-2007



Source: Platts.
October 2008

Electric Market Overview: Spot Prices

Federal Energy Regulatory Commission • Market Oversight @ FERC.gov

Regional Spot Prices: 2005-2007

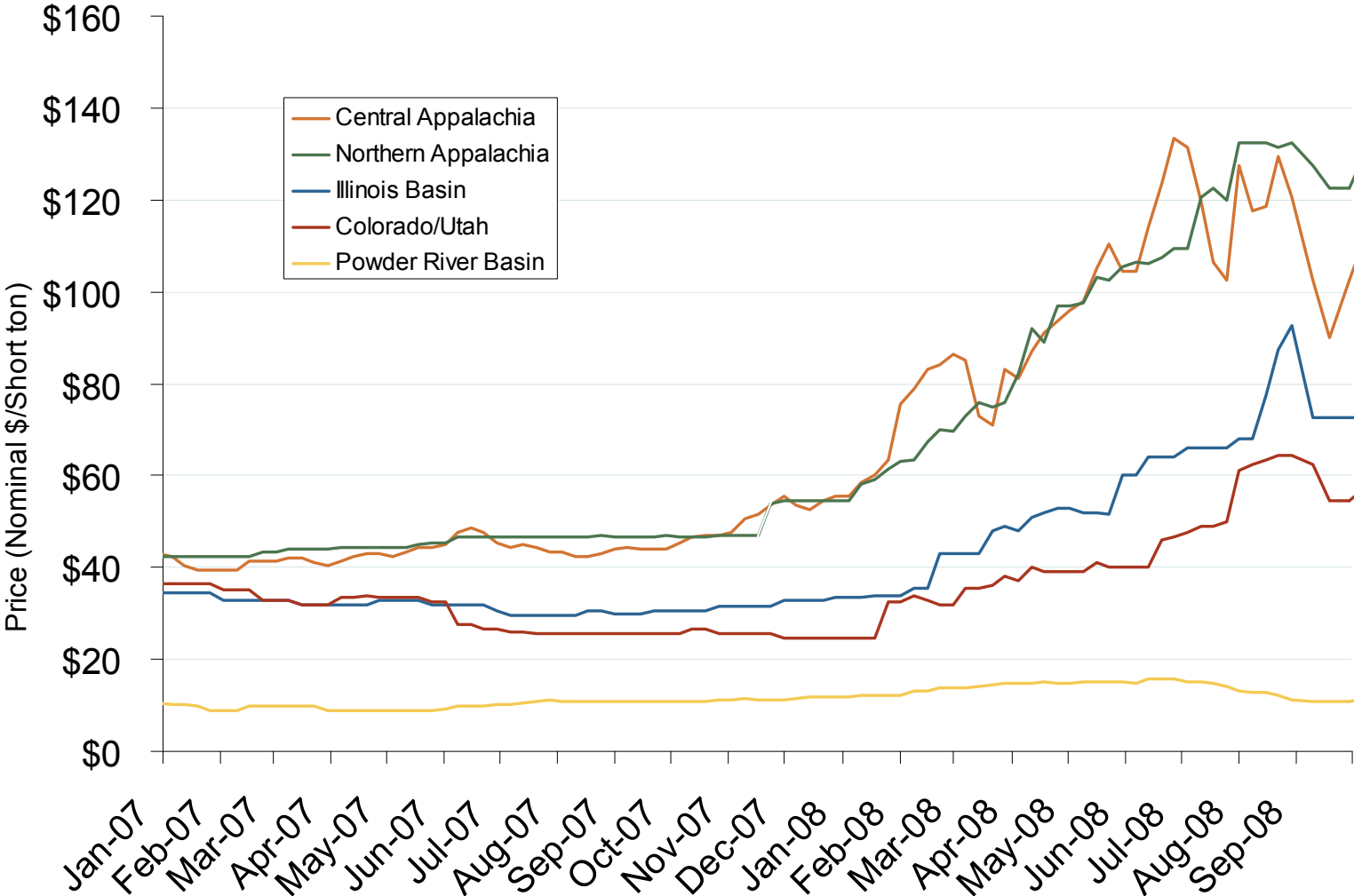
	On-Peak Spot Prices					Off-Peak Spot Prices				
	2005	2006	2007	% Change 05-06	% Change 06-07	2005	2006	2007	% Change 05-06	% Change 06-07
Northeast										
Mass Hub	89.87	69.85	77.39	-22.3%	10.8%	63.75	48.35	55.17	-24.2%	14.1%
Ny Zone G**	92.46	75.95	83.51	-17.9%	10.0%			48.86		
NY Zone J**	110.03	85.96	94.15	-21.9%	9.5%			53.66		
NY Zone A**	76.04	58.70	64.02	-22.8%	9.1%			41.26		
PJM West	76.64	61.90	71.15	-19.2%	14.9%	42.94	37.90	42.80	-11.7%	12.9%
Southeast										
VACAR	71.88	56.34	60.52	-21.6%	7.4%	39.48	35.21	33.99	-10.8%	-3.5%
Southern	70.84	55.50	59.10	-21.7%	6.5%	38.96	34.29	33.30	-12.0%	-2.9%
TVA	67.39	53.48	60.28	-20.6%	12.7%	35.71	33.34	33.86	-6.6%	1.6%
Florida	85.03	64.02	65.59	-24.7%	2.5%	44.23	40.08	36.09	-9.4%	-10.0%
Entergy	69.96	56.28	59.74	-19.6%	6.2%	39.55	34.47	32.18	-12.9%	-6.6%
Midwest										
Cinergy	63.76	51.81	61.20	-18.7%	18.1%	30.90	27.98	29.30	-9.5%	4.7%
Michigan Hub*	72.79	55.29	64.43	-24.0%	16.5%	32.43	30.53	31.40	-5.8%	2.8%
Minnesota Hub*	69.25	59.47	72.32	-14.1%	21.6%	30.30	28.06	29.86	-7.4%	6.4%
NI Hub	61.76	52.52	58.93	-15.0%	12.2%	30.53	29.47	29.64	-3.5%	0.5%
Illinois Hub*	67.92	51.32	59.88	-24.4%	16.7%	30.34	26.77	27.81	-11.8%	3.9%
MAPP South	65.48	55.11	61.18	-15.8%	11.0%	29.77	32.98	31.08	10.8%	-5.8%
South Central										
SPP North	67.44	55.84	60.21	-17.2%	7.8%	36.02	34.20	31.54	-5.1%	-7.8%
ERCOT	70.96	57.83	58.27	-18.5%	0.8%	48.91	39.29	39.04	-19.7%	-0.6%
Southwest										
Four Corners	69.39	58.52	63.21	-15.7%	8.0%	48.75	38.39	40.57	-21.2%	5.7%
Palo Verde	67.39	57.59	61.74	-14.5%	7.2%	49.17	38.63	42.33	-21.4%	9.6%
Mead	70.17	59.93	64.49	-14.6%	7.6%	51.11	40.36	44.54	-21.0%	10.4%
Northwest										
Mid-C	62.95	50.18	56.57	-20.3%	12.7%	52.48	39.08	44.41	-25.5%	13.6%
COB	66.95	55.58	62.14	-17.0%	11.8%	54.07	41.13	46.74	-23.9%	13.6%
California										
NP15	72.49	61.08	66.59	-15.7%	9.0%	53.71	41.20	47.46	-23.3%	15.2%
SP15	73.04	61.95	66.48	-15.2%	7.3%	53.55	42.06	47.13	-21.5%	12.0%

Notes: * As of April 1, 2005. ** Off Peak as of April 2, 2007.

Regional Electric and Input Prices: 2005-2007

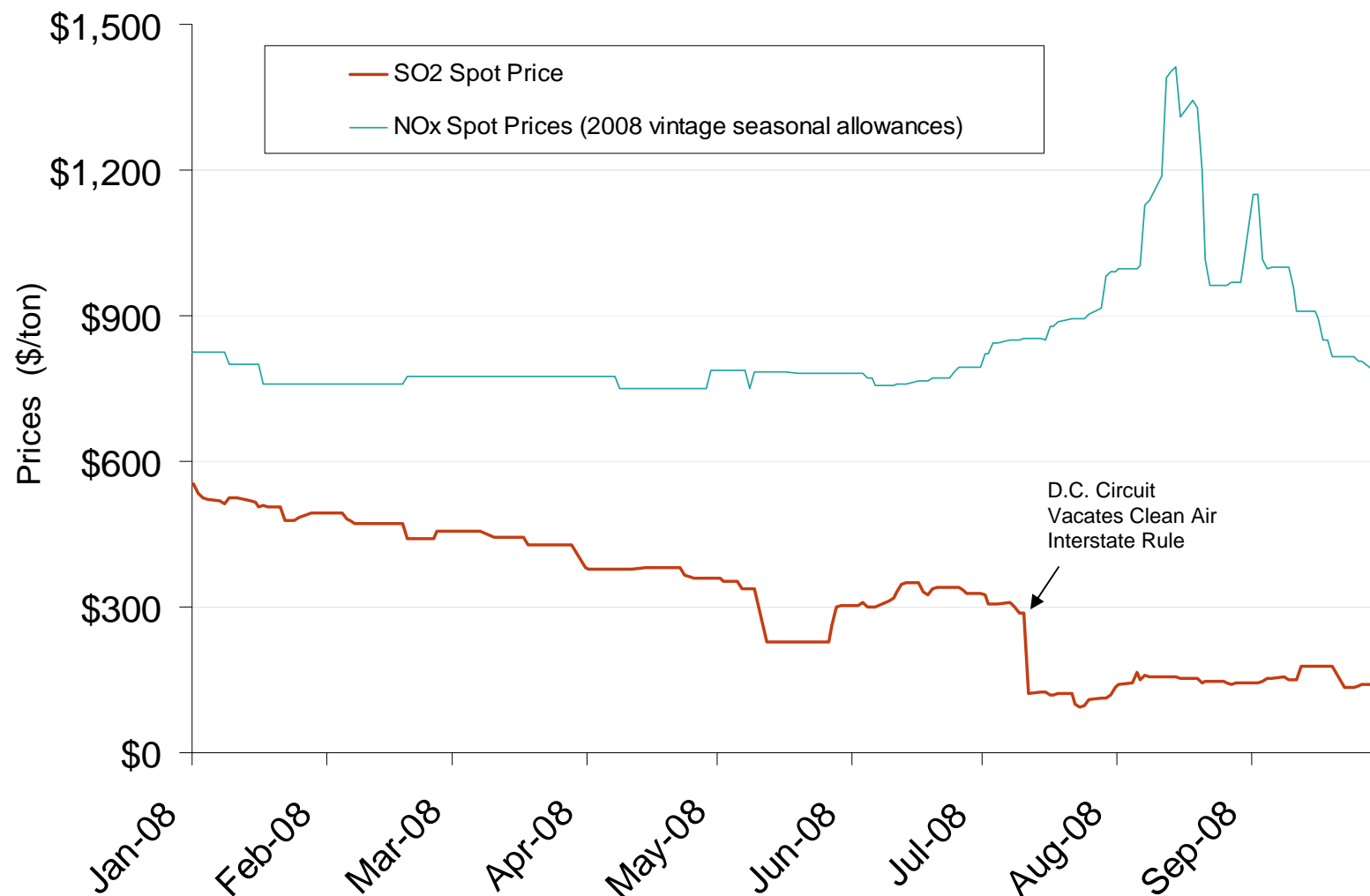
Table 2: Electricity Prices and Input Prices, 2005-07			
	2005	2006	2007
Electric Spot Prices (On-Peak \$ per MWh)			
Mass Hub	\$89.87	\$69.85	\$77.39
Cinergy	\$63.76	\$51.81	\$61.20
SP-15	\$73.04	\$61.95	\$66.48
Input Prices			
Natural Gas (\$ per MMBtu)			
Henry Hub	\$8.69	\$6.74	\$6.94
New York	\$10.03	\$7.37	\$8.46
Southern California	\$7.56	\$6.10	\$6.41
Coal (\$ per ton)			
Central Appalachian (Eastern)	\$60.06	\$51.82	\$44.89
Powder River Basin (Western)	\$9.62	\$13.35	\$10.23
Emissions (\$ per ton)			
SO ₂ Allowances	\$901.21	\$738.12	\$527.58
NO _x allowances	\$2,770.87	\$1,862.03	\$815.87
Oil			
WTI (Crude - \$ per barrel)	\$56.49	\$66.12	\$72.45
Residual Fuel, New York (\$ per barrel)	\$50.43	\$55.07	\$64.35
Distillate Fuel, New York (\$ per gallon)	\$1.86	\$2.04	\$2.22

Central Appalachian and Powder River Basin Coal Prices



Source: Derived from Bloomberg data.
October 2008

SO₂ and NO_x Allowance Spot Prices



National Electric Market Overview: Emission Allowance Prices

Federal Energy Regulatory Commission • Market Oversight @ FERC.gov

Brief Overview of the SO₂ and NO_x Emissions Markets

The electric power industry is a major source of sulfur dioxide emissions (SO₂) and nitrogen dioxide emissions (NO_x) emissions – both precursors of acid rain and smog. According to the Environmental Protection Agency's (EPA) 2006 Acid Rain Progress Report, the power sector is responsible for 70% of SO₂ emissions and 20% of NO_x emissions.

Reduction in SO₂ and NO_x emissions can be obtained through a cap-and-trade program, which is a market-based compliance option that also provides an emitting source with relative flexibility in compliance options. These options include pollution control technology such as flue gas desulfurization (FGD) for SO₂ and selective catalytic reduction (SCR) for NO_x (i.e., scrubbers), fuel switching, and/or participating in their respective cap-and-trade markets. Compliance measures can be capital-intensive and the decision to use pollution controls and/or emission allowances is primarily driven by the regulatory environment, fuel input type and the level of emission output by emitting sources. The associated costs with this decision contribute to the price of wholesale power and ultimately, the retail price.

The Acid Rain Program

<http://www.epa.gov/airmarkets/progsregs/arp/index.html>

EPA's Acid Rain Program (ARP), established under the 1990 Clean Air Act Amendments, required reductions of SO₂ and NO_x emissions from the electric power industry. The Acid Rain Program was the first cap and trade program implemented nationwide to reduce SO₂ emissions. The SO₂ program set a permanent cap on the total amount of SO₂ that can be emitted by fossil fuel-fired generating units and allows allowance trading so affected sources have some flexibility in their compliance method. Currently, SO₂ sources must surrender one allowance to emit one ton of SO₂. If a source falls short on the number of allowances it needs to comply with its individual cap, it can purchase allowances from another source that has a surplus of allowances. An emitting source may have a surplus of allowances for several reasons. For example, if it chose to install and/or run scrubbers then it can "bank" those unused allowances for future use or sell the leftover allowances to other emitting sources.

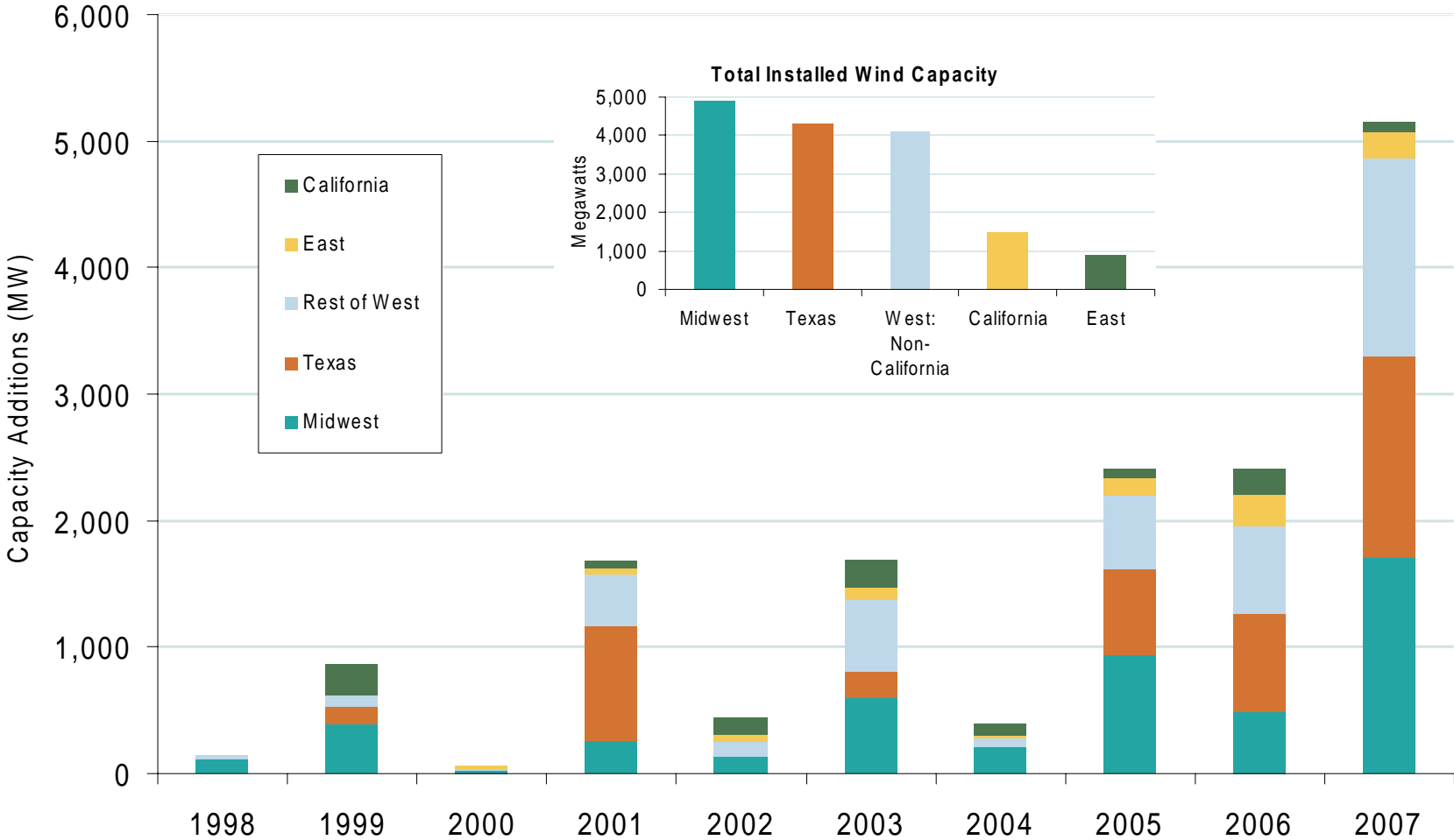
The NO_x Budget Trading Program

<http://www.epa.gov/airmarkets/cap-trade/docs/nox.pdf>

In 2003, the cap-and-trade method was also implemented to reduce seasonal (primarily summer) NO_x emissions from fossil fuel-fired plants. While the EPA administers the program, states are required to share the responsibility for allowance allocation and enforcement. Currently, NO_x sources must surrender one allowance to emit one ton of NO_x.

[1] The Acid Rain Program also required NO_x emission reductions by select coal units but under a rate-based regulatory program [\[http://www.epa.gov/airmarkets/progsregs/arp/nox.html\]](http://www.epa.gov/airmarkets/progsregs/arp/nox.html).

Growth of U.S. Installed Wind Capacity (MW)



Midwest includes: IL, IA, KS, MI, MN, MS, NE, ND, OH, OK, SD, WI
East includes: ME, MA, NH, NJ, NY, PA, RI, TN, VT, WV

Source: American Wind Energy Association (AWEA)
October 2008

Updated March 7, 2008

2007 Review of Wind Generation

- Installed wind capacity grew 5,244 MW from 11,603 MW in 2006 to 16,818 MW in 2007, a 45% increase.
- More new wind capacity was added in 2007 than any prior year.
- Just over half of new capacity – 2,704 MW – was installed in states with the highest wind potential. 59 percent of that – 1,588 MW – was in Texas.
- Installed capacity grew 150% from 2004 to 2007, while:
 - the number of states (including D.C.) with a renewable portfolio standard grew from 21 to 27, and
 - the wind production tax credit did not lapse.
- The top five states by capacity added in 2007 were: Texas (1,618 MW), Colorado (776), Illinois (592), Oregon (447), and Minnesota (405). Texas moved into 1st place in installed wind capacity in 2006, passing long-time leader California.
- The top 10 states by cumulative installed capacity have 14,366 MW of wind, or 85% of U.S. capacity. Nine of them had a Renewable Portfolio Standard (RPS) in 2007.
- The rapid growth of wind generating capacity has led to a backlog in many interconnection queues. The Commission held a Technical Conference on December 11, 2007 (AD08-2-000) to re-examine the Large Generator Interconnection Rule. Many ISO/RTOs reported that the queuing procedures specified by Order 2003 impede the timely interconnection of wind resources.