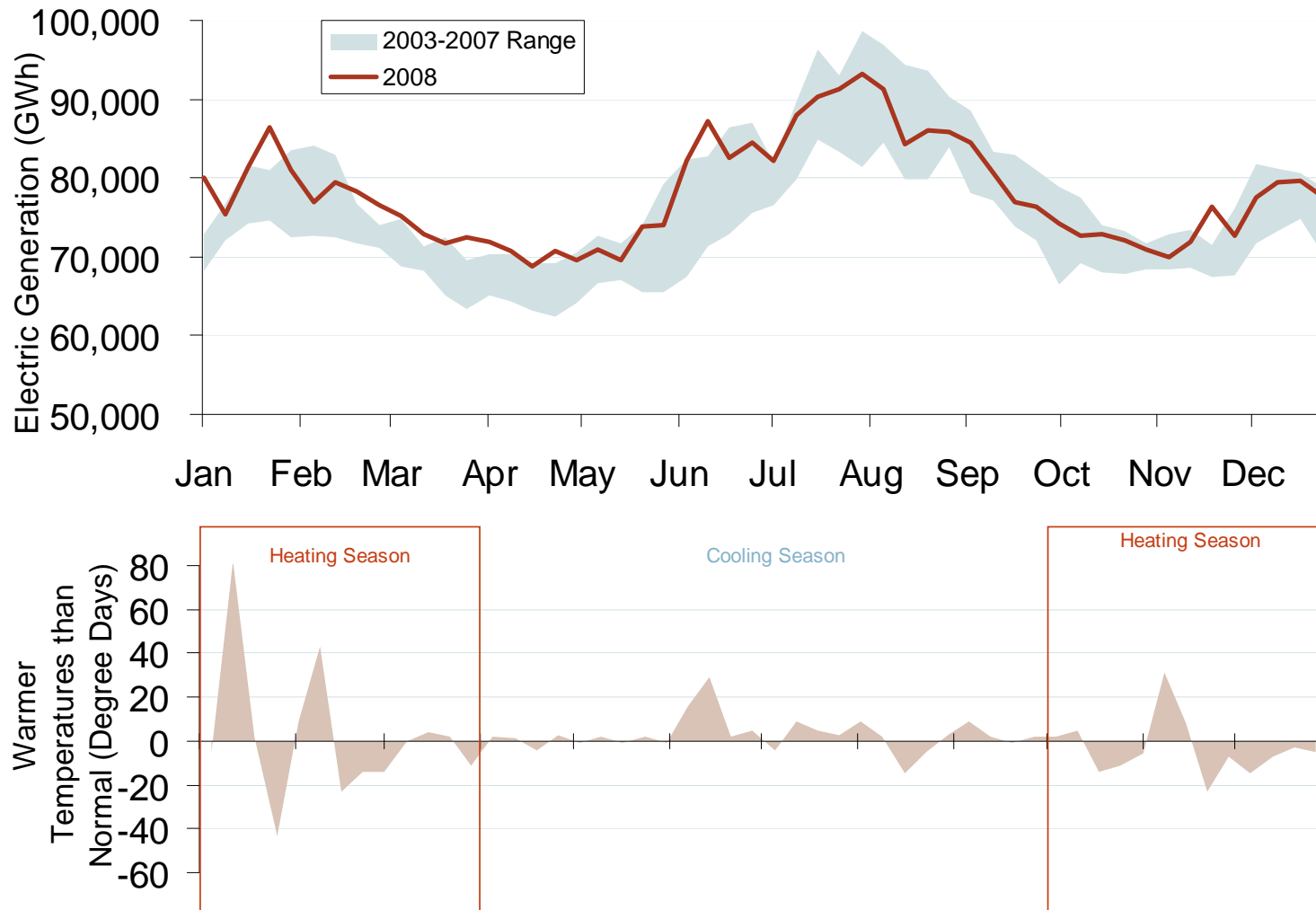


This map was created using
Platts POWERmap, November 2008
January 2009

REGIONAL TRANSMISSION ORGANIZATIONS

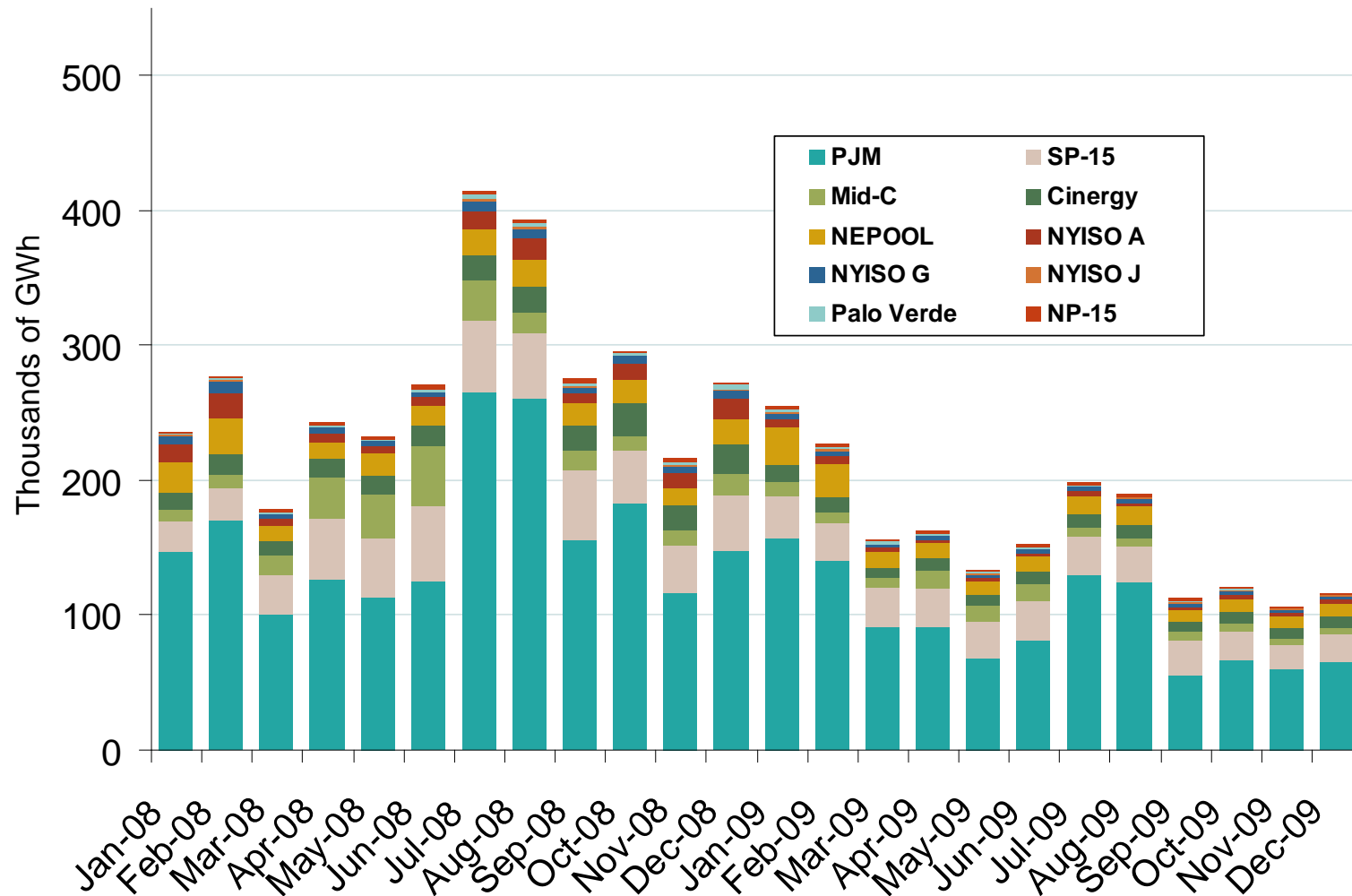
Weekly U.S. Electric Generation Output and Temperatures



Source: Derived from *EI* and NOAA data.

Updated January 9, 2009

Financial Trading on ICE by Contract Month

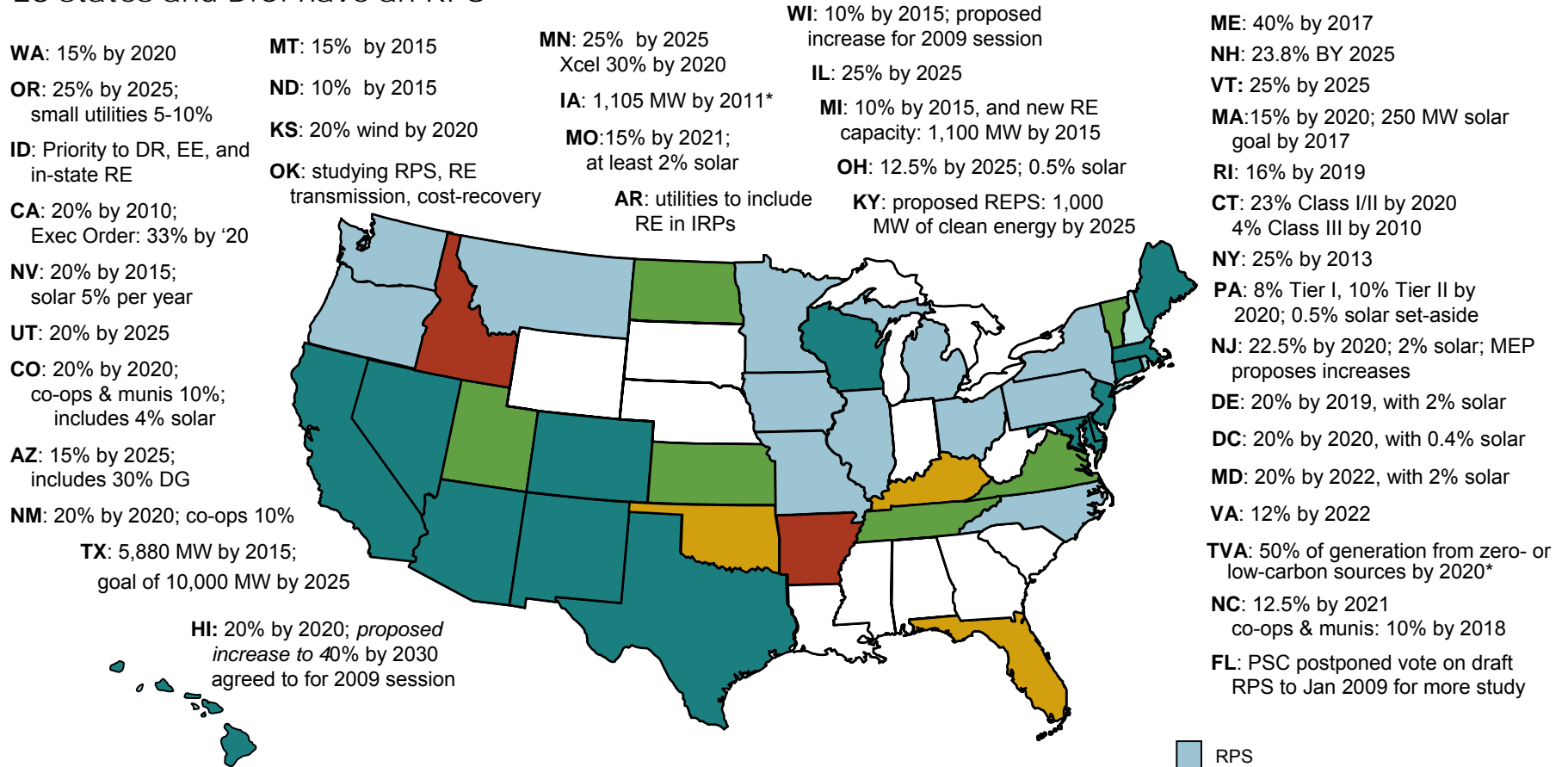


Source: Derived from ICE data. ICE on-peak swaps (financial) volume include monthly, dual monthly, quarterly, and calendar year contracts traded for each month.

Updated January 9, 2009

Renewable Energy Portfolio Standards (RPS)

28 states and D.C. have an 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

Updated December 5, 2008

Renewable Energy Portfolio Standards

- **A Renewable Portfolio Standard (RPS)** requires a percent of energy sales or installed capacity to come from renewable resources.
- **28** states and D.C. have renewable energy standards.
- **Five** states have renewable goals without financial penalties: UT, ND, KS, MO, VA, VT.
- **Three** states, including Florida, Kentucky and Oklahoma, are actively working towards establishing a renewable standard by legislation by 2009.
- **Sixteen** states include energy efficiency in their RPS or renewable goals; more are considering energy efficiency additions or companion bills.
- Recent state policy developments include:
 - **Kentucky** Governor Beshear announced a comprehensive energy plan, *Intelligent Energy Choices for Kentucky's Future* (Nov 20). It calls for KY to establish both a Renewable and Efficiency Portfolio Standard (REPS) and an Alternative Transportation Fuels Standard. The REPS goal is to triple KY's use of renewables to 1,000 MW by 2025. The plan includes generation from the state's extensive biofuels resources.
 - **California:** Governor Schwarzenegger signed an Executive Order (Nov 17) to increase California's Renewable Energy Standard to 33% by 2020. He will propose legislation to codify the new standards and to spread costs among all ratepayers, with safeguards for low income customers. The Order also calls for streamlining the approval process for renewable projects by creating a one-stop shop agreed to by the CEC and DFG. Voters had turned down an RPS increase to 50% by 2025 at the polls on Nov 4.
 - **Hawaii:** Hawaii Electric Industries, which distributes 96% of Hawaii's power through three regulated utilities, signed an agreement with the Governor and other state agencies to set the Hawaii Clean Energy Initiative (HCEI) goals. The HCEI, along with a MOU HI signed in Jan 2008 with DOE to accelerate the development of renewables, could spur major investments. The HCEI includes plans to:
 - Increase the RPS to 40% by 2030
 - Introduce an EERS in the 2009 legislative session (EE now counts towards some of the RPS)
 - Create a feed-in tariff for renewables by 2009
 - Create a utility-run solar PV hosting program

Abbreviations: CEC: California Energy Commission; DFG: California's Department of Fish and Game; DOE: U.S. Department of Energy; EE: energy efficiency; HCEI: Hawaii Clean Energy Initiative; PV: photo-voltaic; REPS: Renewable and Efficiency Portfolio Standard

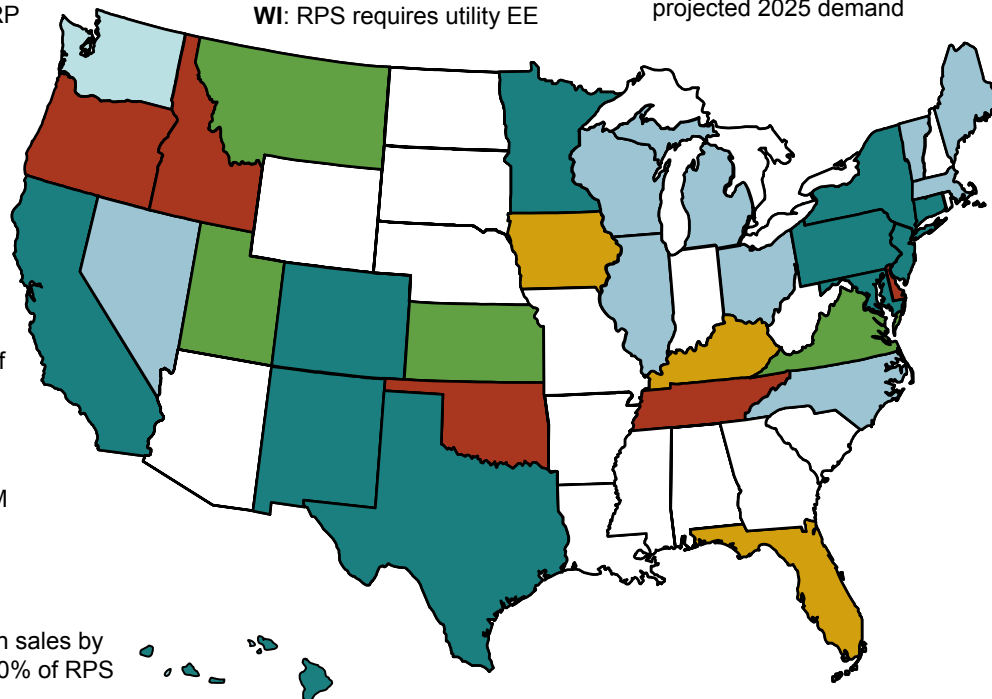
Energy Efficiency Resource Standards (EERS)

- ID:** Energy Plan puts conservation – DR and EE – as priority resource
- MT:** state agency reduction initiative: save 20% by 2010
- 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:** Order advocates voluntary utility programs, not mandate
- 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

- MN:** reduce fossil fuel use 15% by 2015 through EE, RE
- IA:** utilities must establish EE goals by end of 2008
- MI:** annual savings: 1% of prior year's sales by 2012
- WI:** RPS requires utility EE

- IL:** reduce energy 2% by 2015 (EE) and 0.1% from prior year (DR)
- OH:** reduce peak-demand 8% by '18; 22% energy savings by '25
- KY:** proposed REPS - EE and conservation to offset 18% of projected 2025 demand

- ME:** 10% new EE by 2017; in RPS goal as 2nd priority
- VT:** EE & RE to meet 2007-12 growth
- 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 peak demand 5,700 MW by 2020
- DE:** EE, RE, DG, and DR are priority resources before new gen
- PA:** reduce energy consumption 3% and peak demand 4.5% by 2013
- DC:** reduce 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



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

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

Updated December 5, 2008

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 16 include EE as part of a renewable standard or goal.
- States that enacted significant energy efficiency legislation in 2008 include: DC, FL, HI, IA, MA, MD, MI, NJ, NM, NY, PA, OH, OK, UT, and VT.
- State energy plans have included decoupling and PUCs opened dockets to examine whether utilities should be encouraged or required to eliminate the throughput incentive in traditional rates, including: HI, KY, MI, NJ.
- **Kentucky** Governor Beshear announced a comprehensive energy plan, *Intelligent Energy Choices for Kentucky's Future* (Nov 20). It calls for KY to establish both a Renewable and Efficiency Portfolio Standard (REPS) and an Alternative Transportation Fuels Standard. First among Kentucky's strategies will be to improve the EE of its homes, buildings, industries, and transportation fleets. Its first goal is to use EE to offset 18% of projected 2025 demand. Altogether, the plan envisions that 25% of Kentucky's energy needs will be met by 2025 with greater efficiency, conservation, and use of renewable and alternative sources such as wind, solar, and biofuels.
- The **Kansas Corporation Commission (KCC)** issued an Order on Cost Recovery and Incentives for Energy Efficiency Programs (Nov 14). It states that energy efficiency is a resource in its own right; however, the KCC deemed it inappropriate to create an EE mandate or EERS. Because EE programs are inherently beneficial to utilities, they might not need regulatory encouragement. KCC's policy will be to consider proposals from utilities on a case-by-case basis for: cost-recovery for EE programs through tariff riders; decoupling to address the throughput-incentive issue; and shared savings performance incentive plans (rather than performance-based incentives).
- **NERC's Long-Term Reliability Assessment** highlights the growth in demand response and energy efficiency resources, and the role they play in providing critical reliability services, increasing the operational flexibility of the grid, and complementing new variable generation resources such as wind and solar. NERC projects that close to 11,000 MW of EE and 34,000 MW of DR will be in place in North America by 2016. As a consequence, it expects EE to reduce total demand by 3.3%, and DR to offset nearly 80% of U.S. peak demand growth. (Nov 20)
- The Western Governors Association sent President-elect Obama a letter urging him to "aggressively pursue a national [EE] program to reduce existing and future energy demand and thereby reducing [GHG] emissions." (Nov 20)

Abbreviations: DR - demand response; DSM - demand side management; DSR – demand-side resources; EE - energy efficiency; KCC – Kansas Corporation Commission; NERC - North American Electric Reliability Corp; RE – renewable energy; RGGI - Regional Greenhouse Gas Initiative; RPS - Renewable Portfolio Standard

Collaborative Greenhouse Gas (GHG) Programs

Collaborative Regional GHG Programs:

- Three North American groups with goals to lower regional GHG emissions were initiated by state Governors.
- 32 U.S. states, D.C., eight Canadian provinces, and six Mexican states are Participants or Observers.
- Observer jurisdictions do not commit to group GHG reduction goals, but participate in proceedings should they opt to join later. RGGI Observers are not on its Board.

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 Reduction Accord:

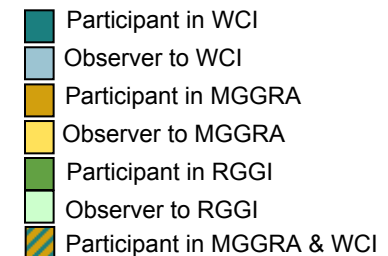
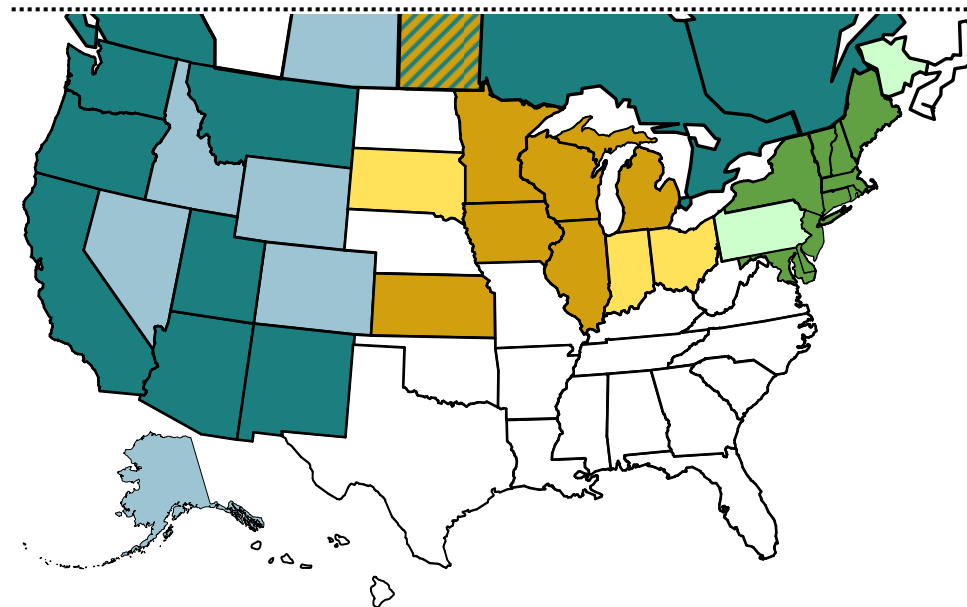
- Established November 2007
- Participants: 6 states, 1 province; 3 Observer states, 1 province
- *Preliminary* GHG policy recommendation: 15 – 25% reductions by 2020, 60 – 80% by 2050

Regional Greenhouse Gas Initiative (RGGI):

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

Auctions:

- 1. 9/25:** 12.5 million allowances sold by 6 states, clearing at \$3.07/allowance.
- 2. 12/17/08:** first 6 states plus NY, NJ, NH, DE to participate in sale of 31.5 million allowances
- 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 and Quebec are Partners to WCI and Observers to RGGI; Ontario is also an observer to RGGI. Sources: Regional initiatives: www.rggi.org, www.midwesternaccord.org, www.westernclimateinitiative.org, trade press, Pew Center.

Collaborative Greenhouse Gas Programs

Multiple parties call for national GHG standards:

- President-elect Obama pledged support for an emissions cap-and-trade system; he has said he would establish annual targets to reduce emissions to 1990 levels by 2020 and reduce them an additional 80% by 2050.
- Rep. Henry Waxman, Chair-elect of the House Energy and Commerce Committee, joined 150 House Democrats in Oct in outlining “principles” for climate change legislation, including emissions reductions of at least 15% by 2020.
- The Western Governors Association (WGA) sent President-elect Obama a letter urging him to “establish an aggressive and achievable national [GHG] reduction goal,” and to “propose a mandatory national system for reducing [GHG] emissions that makes maximum use of market mechanisms.”

RGGI to hold Second Auction on December 17:

- Participants: CT, DE, MA, ME, MD, NH, NJ, NY, RI, VT
- Observers: PA, D.C., Ontario, Quebec, New Brunswick
- Six states from 1st auction will auction 1/6 of allowances in remaining 2008-09 auctions: CT, MA, ME, MD, RI, VT.
- DE, NH, NJ, and NY will participate in Auction 2, having passed necessary legislation since Auction 1. They will auction 20% of their allowances in each of 5 auctions.
- Auction 2 includes 31.5 million allowances at a base price of \$1.86/allowance.
 - The number of allowances is higher in Auction 2, because NY and NJ have larger quantities to auction.
 - In Auction 1 (9/25), 12.5 million allowances cleared at \$3.07/allowance, raising \$38.5 million. The base price of \$1.86/allowance was the same.
- The auction will begin on Dec 17th; results are expected by Dec 19.
- About 90 participants are said to have applied to bid at Auction 2, compared with 59 entities that bid in Auction 1.

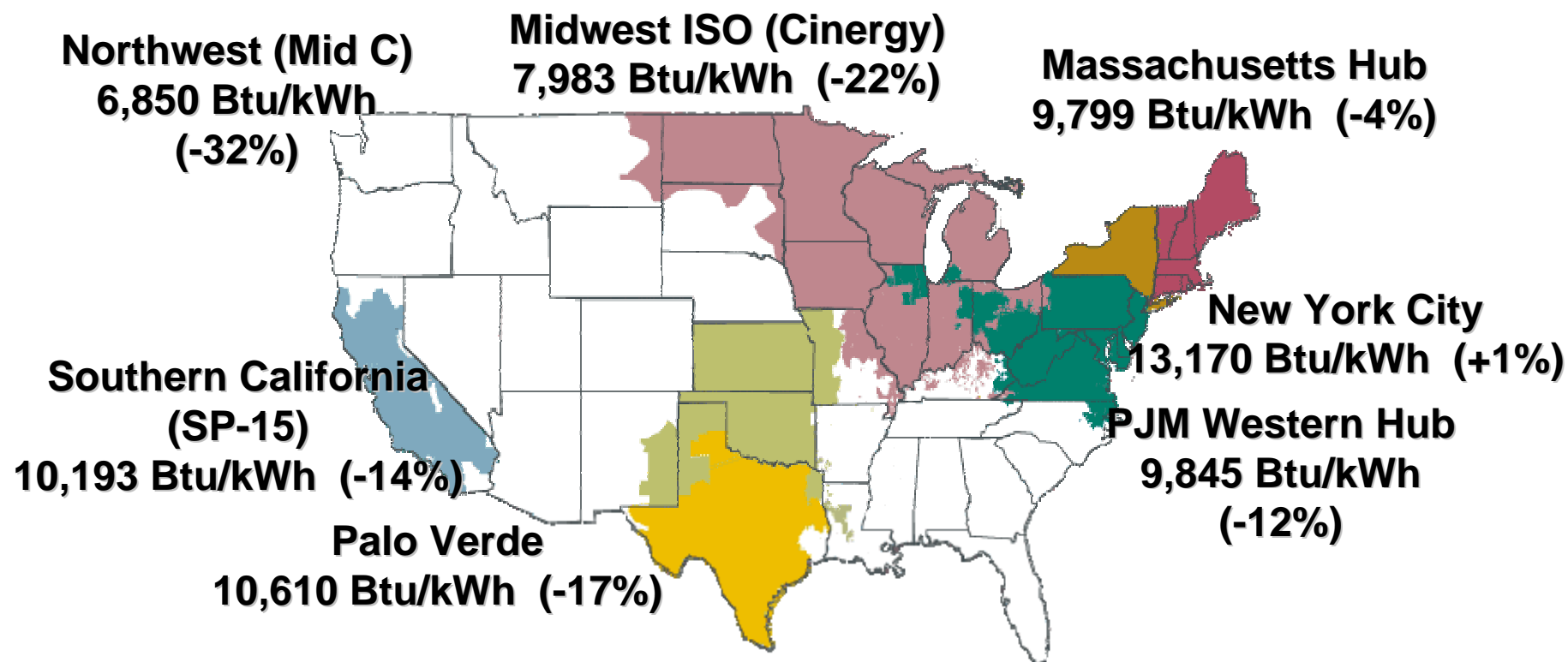
Midwest Greenhouse Gas Regional Accord:

- 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
- Expects to release draft design in Dec. To be decided:
 - Which sectors should cap-and-trade cover?
 - electric power and large industrials (nearly ½ of regional emissions)
 - or include transportation, too (1/4)
 - Target reductions from 2005 levels:
 - 15% - 20% - 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.

Western Climate Initiative (WCI):

- Launched by WGA in Feb 2007 to reduce regional GHG collectively and cooperatively.
 - Partners: AZ, British Columbia, CA, Manitoba, MT, NM, Ontario, OR, Quebec, UT, WA
 - Observers: AK, CO, ID, KS, NV, Sask., WY
- WCI announced design for a market-based, *multi-sector* cap-and-trade program (Sept 2008):
 - 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

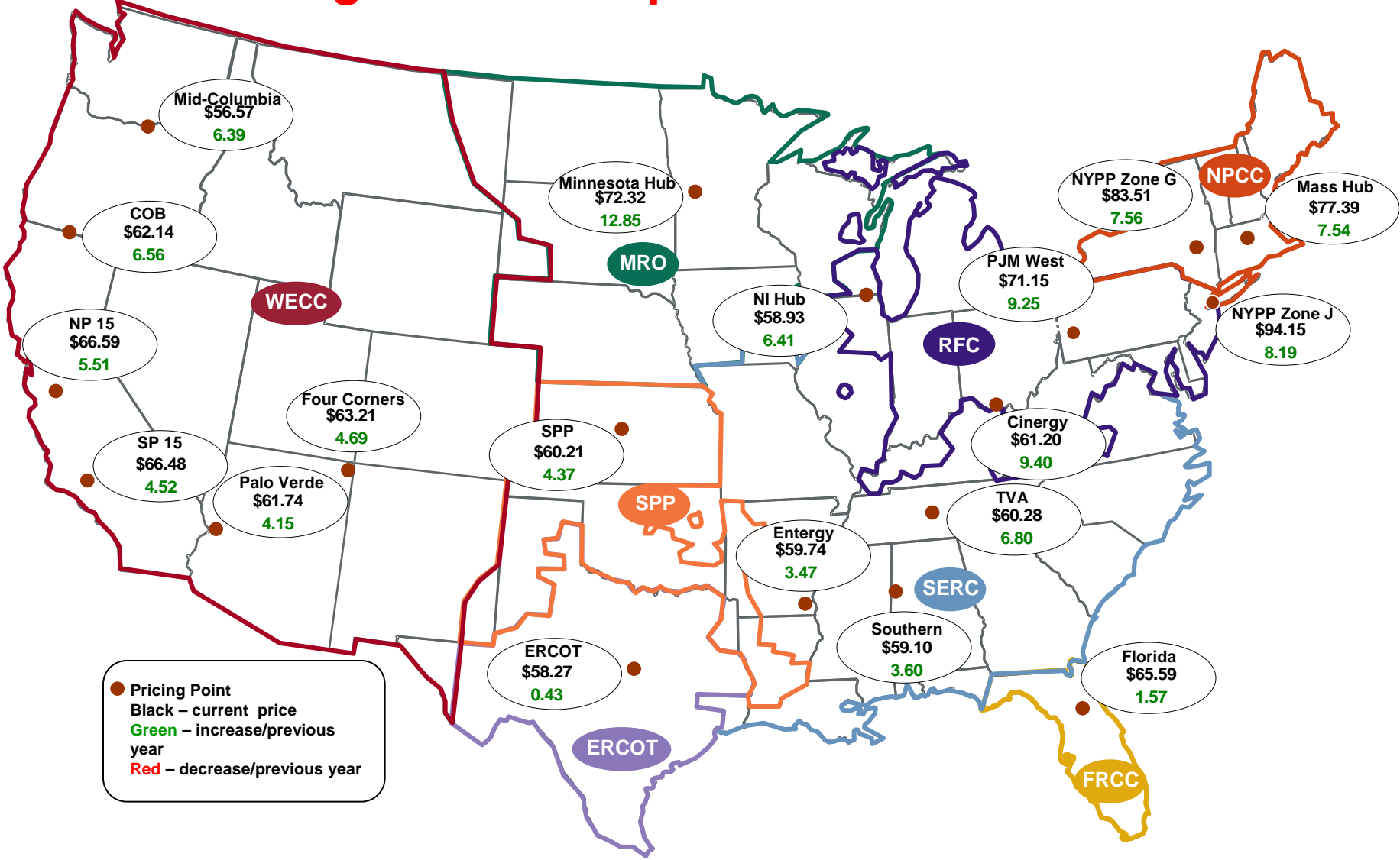


Source: Implied heat rates derived from Platts *Megawatt Daily* data.

Updated September 9, 2008

1206

Average On-Peak Spot Electric Prices 2007



Source: Derived from Platts data.

Updated March 20, 2008

Electric Market Overview: Regional 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

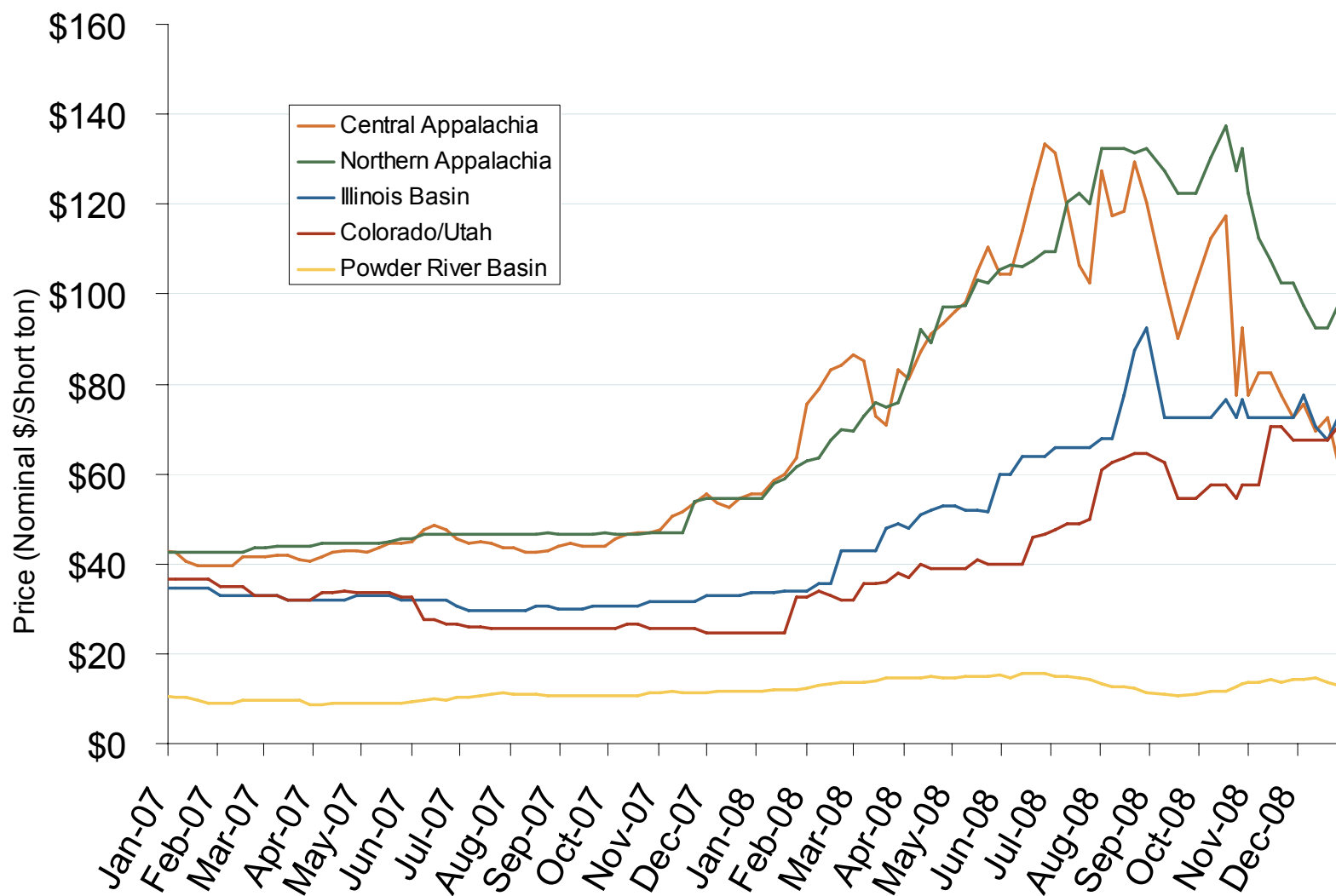
Table 2: Electricity Prices and Input Prices, 2005-07			
	2005	2006	2007
Electric Spot Prices (On-Peak \$ per MWh)			
Mass Hub	\$89.87	\$69.85	\$77.39
Cinergy	\$63.76	\$51.81	\$61.20
SP-15	\$73.04	\$61.95	\$66.48
Input Prices			
Natural Gas (\$ per MMBtu)			
Henry Hub	\$8.69	\$6.74	\$6.94
New York	\$10.03	\$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

Source: Derived from Platts & Bloomberg data.

Updated March 20, 2008

1209

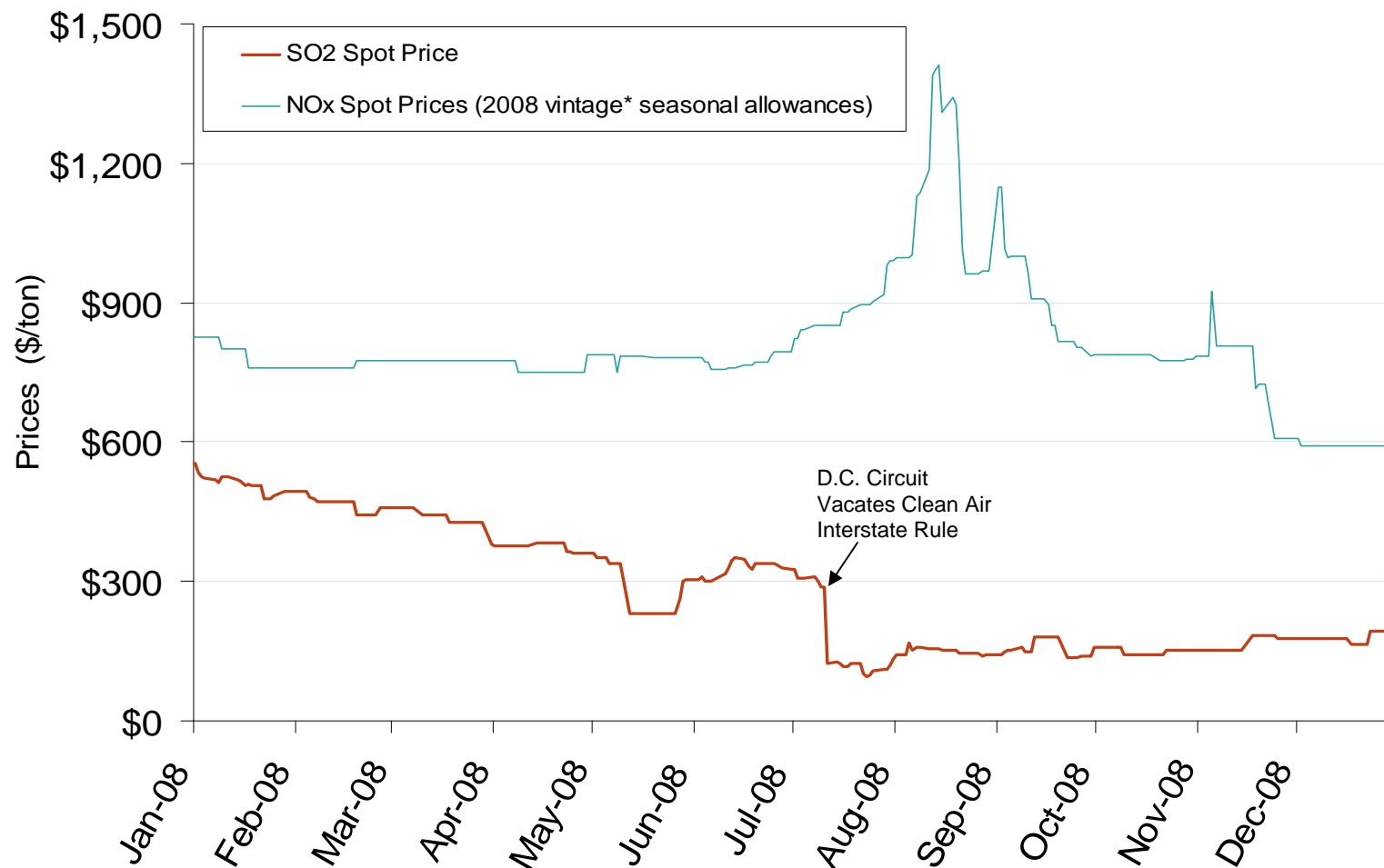
Central Appalachian and Powder River Basin Coal Prices

Source: Derived from *Bloomberg* data.

Updated January 9, 2009

1148

SO₂ Allowance Spot Prices and NOx Seasonal Allowance Spot Prices



Source: Derived from *Cantor Fitzgerald* data.

* Earliest year an allowance may be applied against emissions.

Updated January 9, 2009

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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) – 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.

Currently US policy encourages reduction in SO₂ and NO_x emissions which can be achieved through a cap and trade program. This market based model also allows for relative flexibility in compliance options. An emitting source may choose pollution control technology such as add-on controls like flue gas desulfurization (FGD) for SO₂ and selective catalytic reduction (SCR) for NO_x, fuel switching, and/or participation in the respective cap and trade markets. The decision is primarily driven by the regulatory environment, fuel input type, the level of emission output, and compliance costs, the latter of which affects wholesale and retail prices.

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, requires 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.^[1] 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, it can "bank" those unused allowances for future use or sell the leftover allowances to other emitting sources.

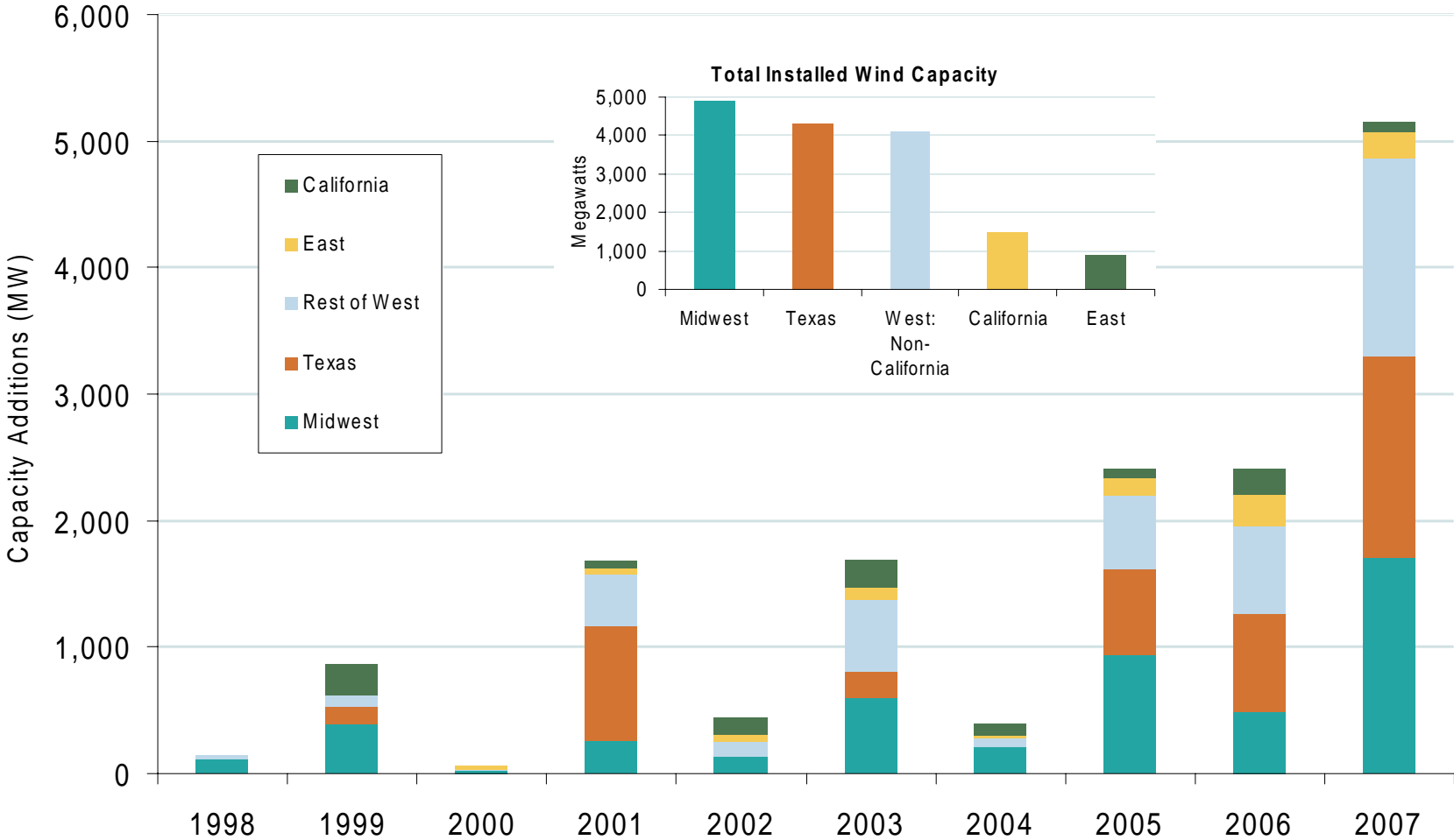
The NO_x Budget Trading Program

<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>].

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)

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.