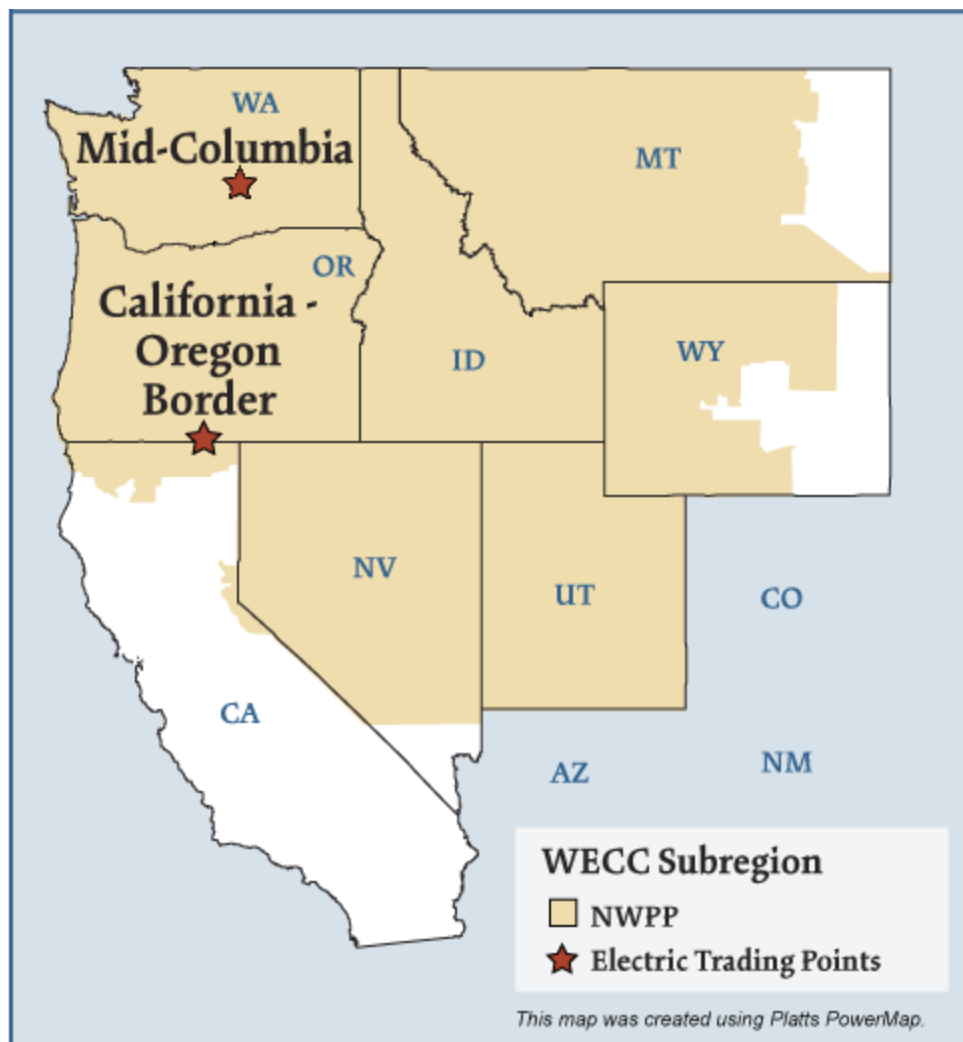


## Northwest Electric Market



## Northwest Electric Market: Overview and Focal Points

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### Overview

#### Geography

States covered: All or most of Washington, Oregon, Idaho, Utah, Nevada, Montana, Wyoming and part of California.

Reliability region: Northwest Power Pool Area (NWPP) sub-region of the Western Electric Coordinating Council (WECC).

Balancing authorities: See page 5.

Hubs: California-Oregon Border (COB), Mid-Columbia (Mid-C)

#### RTO/ISO

None

#### Generation/Supply

Marginal fuel type: Hydro and natural gas

Generating capacity (winter 2005): 57,120 MW

Capacity reserve (winter 2005): 16,822 MW

Reserve margin (winter 2005): 42%

When taken together, hydro, fossil fuels, nuclear energy, and renewable resources, were adequate to provide electricity in excess of in-region needs.

*Updated May 3, 2007*

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## Northwest Electric Market: Overview and Focal Points

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#### Demand

All time peak demand (2005): 40,298 MW

Peak demand growth: 1.5% (2004–2005)

#### Prices

Index Annual Average of Daily Bilateral Day Ahead On-Peak Prices:

Platts California-Oregon Border (COB) Hub:

2004: \$49.02/MWh 2005: \$66.95/MWh 2006: \$55.58/MWh 2007: \$62.14/MWh

Platts Mid-Columbia (Mid-C) Hub:

2004: \$44.50/MWh 2005: \$62.95/MWh 2006: \$50.18/MWh 2007: \$56.57/MWh

Physical and financial electricity products are traded through brokers using the Mid-Columbia (Mid-C) and California-Oregon Border (COB) hubs as pricing points.

#### Interconnections/Seams

The region relies on hydroelectric production for approximately two thirds of its electricity needs. In most years, Northwest sells surplus power into California and the Southwest.

## Balancing Authorities in the Northwest Electric Market

### Balancing Authority

### NERC Acronym

Alberta Electric System Operator	AESO
Avista Corp.	AVA
Bonneville Power Administration	BPAT
British Columbia Transmission Corporation	BCHA
Idaho Power Company	IPCO
NorthWestern Energy	NWMT
PacifiCorp-East	PACE
PacifiCorp-West	PACW
Portland General Electric Company	PGE
PUD No. 1 of Chelan County	CHPD
PUD No. 1 of Douglas County	DOPD
PUD No. 2 of Grant County	GCPD
Puget Sound Energy	PSEI
Seattle Department of Lighting	SCL
Sierra Pacific Power Company	SPPC
Tacoma Power	TPWR
Western Area Power Administration - Upper Great Plains West	WAUW

## Supply and Demand Statistics for the Northwest

<b>Supply Demand Statistics</b>			
	2003	2004	2005
Winter Generating Capacity MW	54,802	57,101	57,120
Winter Peak Demand MW	35,456	39,710	40,298
Winter Reserves MW	19,346	17,391	16,822
Winter Reserve Margin:	55%	44%	42%
Annual Load (GWh):	219,582	223,148	234,153
Annual Net Generation GWh	NA	NA	NA

Source: Derived from WECC data.

Updated February 2, 2007

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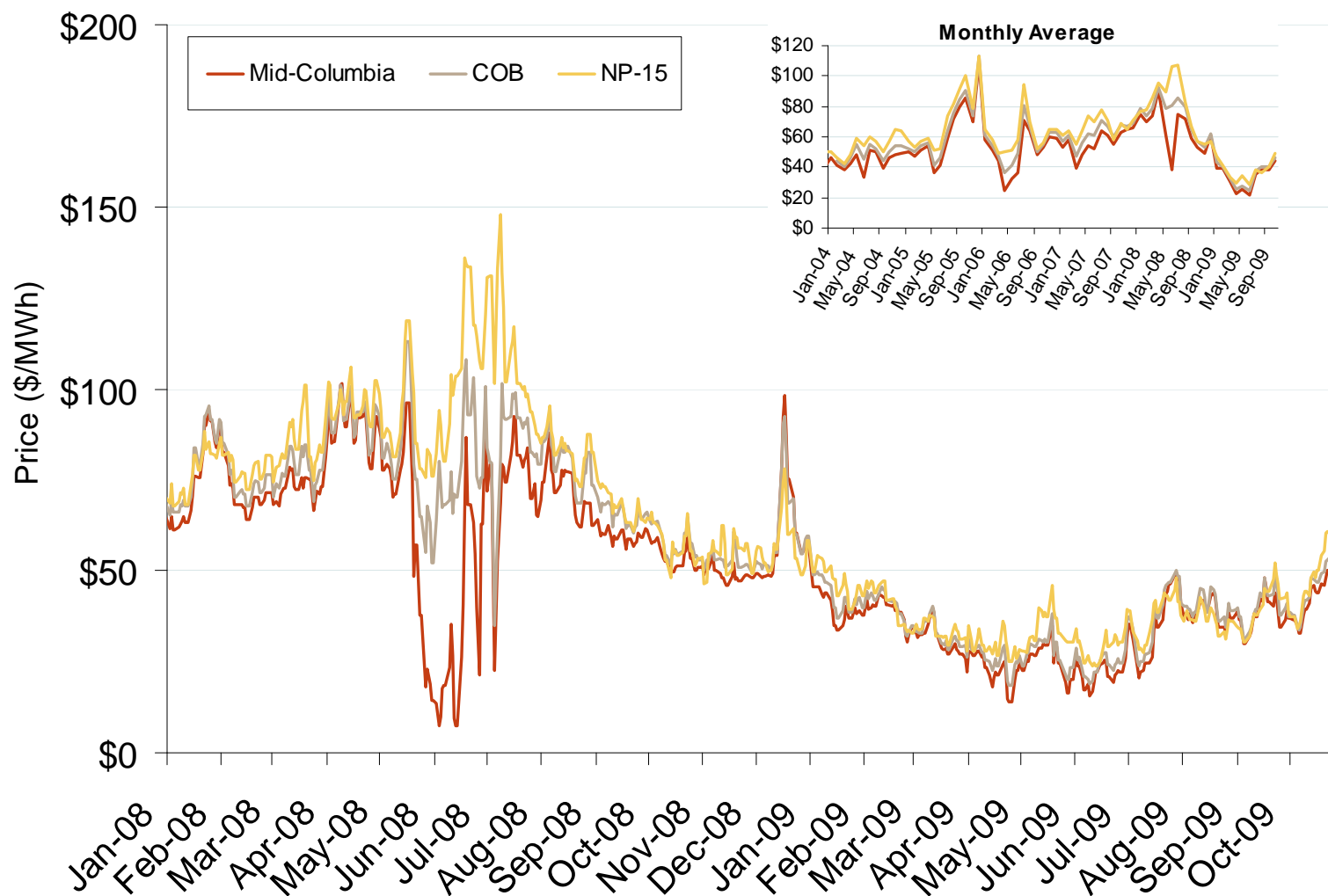
## Annual Average Bilateral Prices

Annual Average Day Ahead On Peak Prices (\$/MWh)						
	2004	2005	2006	2007	2008	5-Year Avg
Mid-Columbia (Mid-C)	\$44.53	\$62.95	\$50.18	\$56.57	\$65.00	\$55.84
California-Oregon Border (COB)	\$49.08	\$66.95	\$55.58	\$62.14	\$73.86	\$61.52

## Northwest Electric Market: Northwestern Bilateral Prices

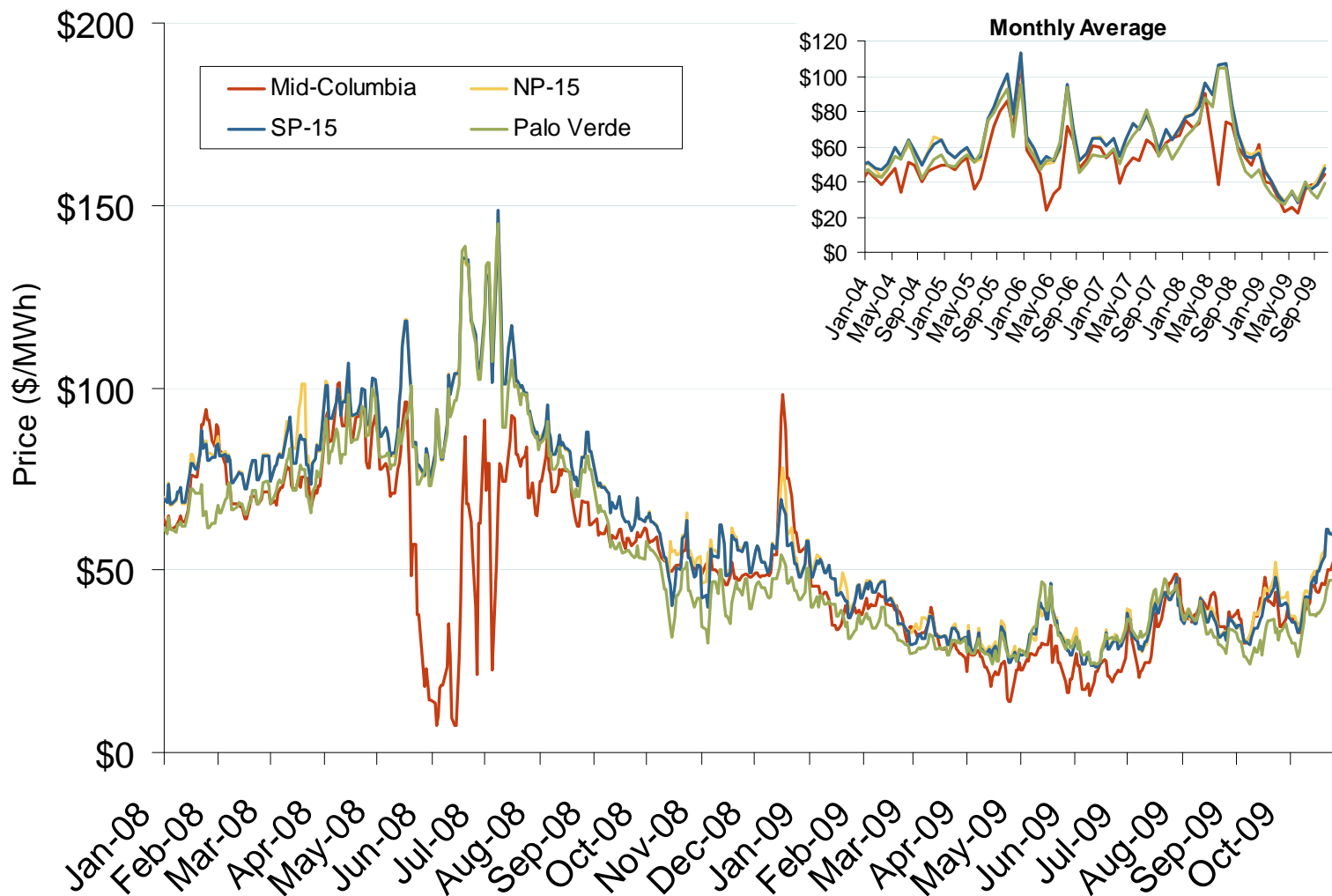
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# Northwestern Daily Bilateral Day-Ahead On-Peak Prices

Source: Derived from *Platts* data.

Updated November 6, 2009 1041

# Western Daily Bilateral Day-Ahead On-Peak Prices

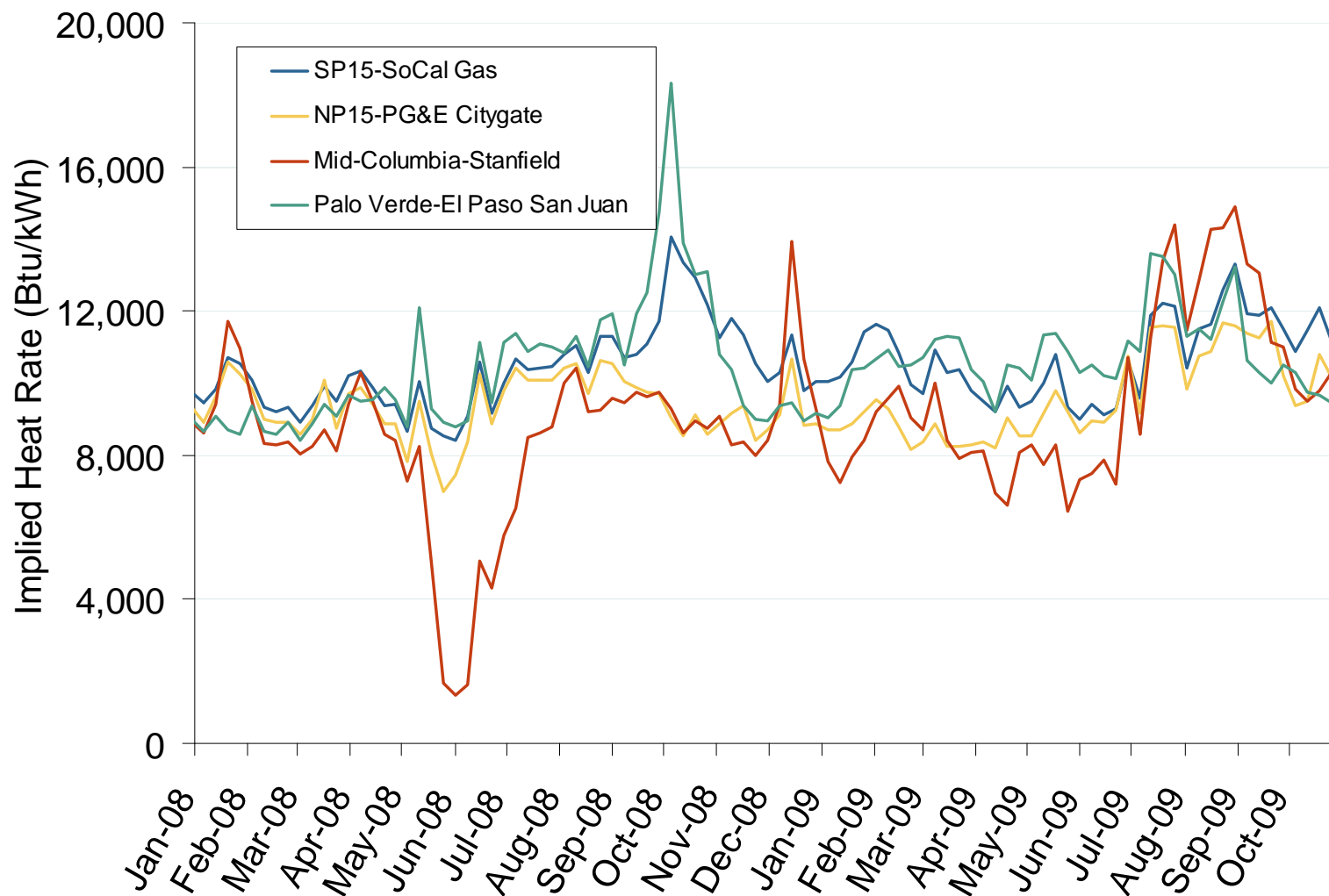


Source: Derived from *Platts* on-peak electric and natural gas price data.

Updated November 6, 2009 1042



## Implied Heat Rates at Western Trading Points Weekly Averages

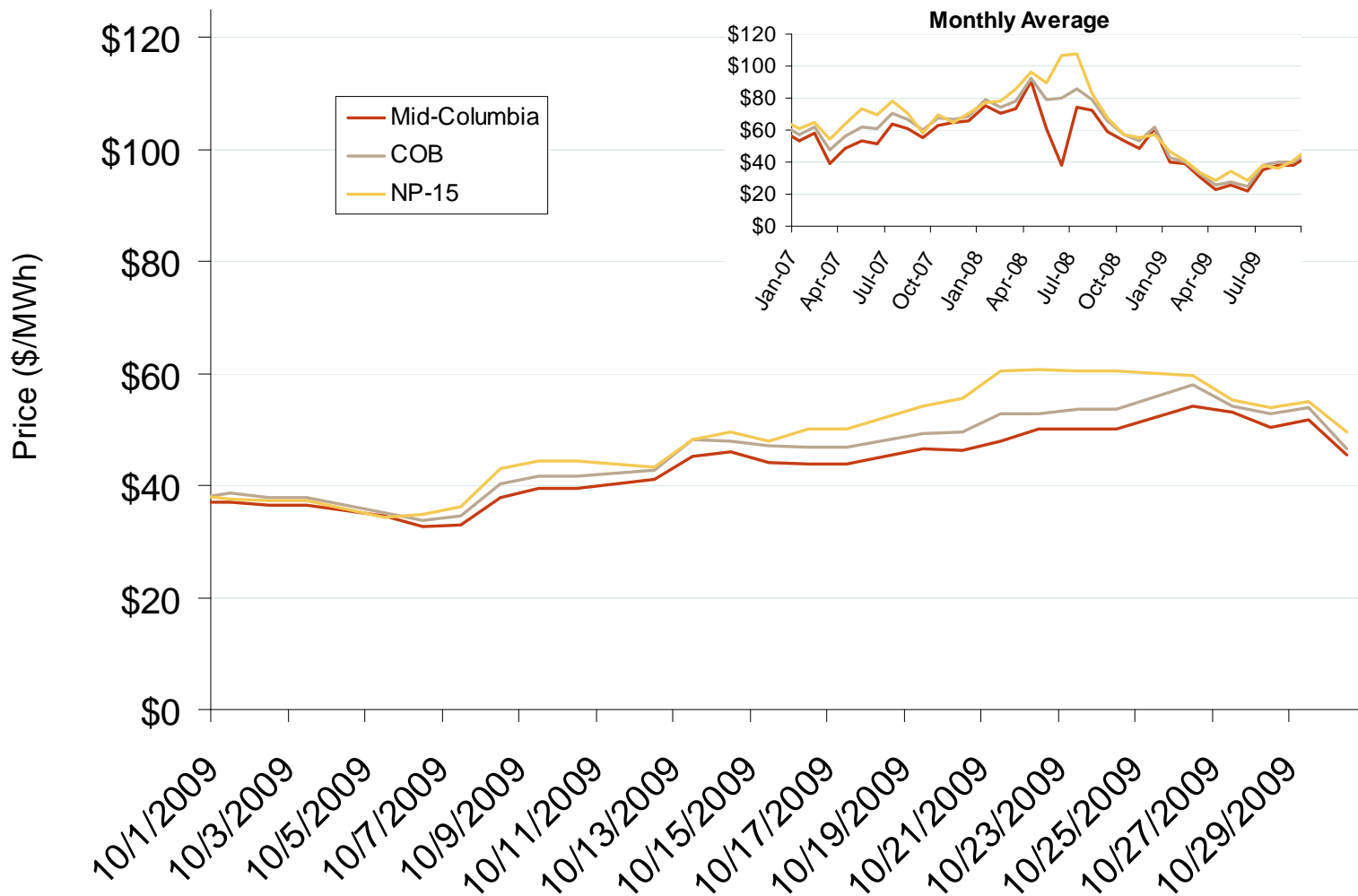
Source: Derived from *Platts* data

Updated November 6, 2009 1142

Northwest Electric Market: Last Month's Northwestern Bilateral Prices

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# Northwestern Daily Bilateral Day-Ahead On-Peak Prices

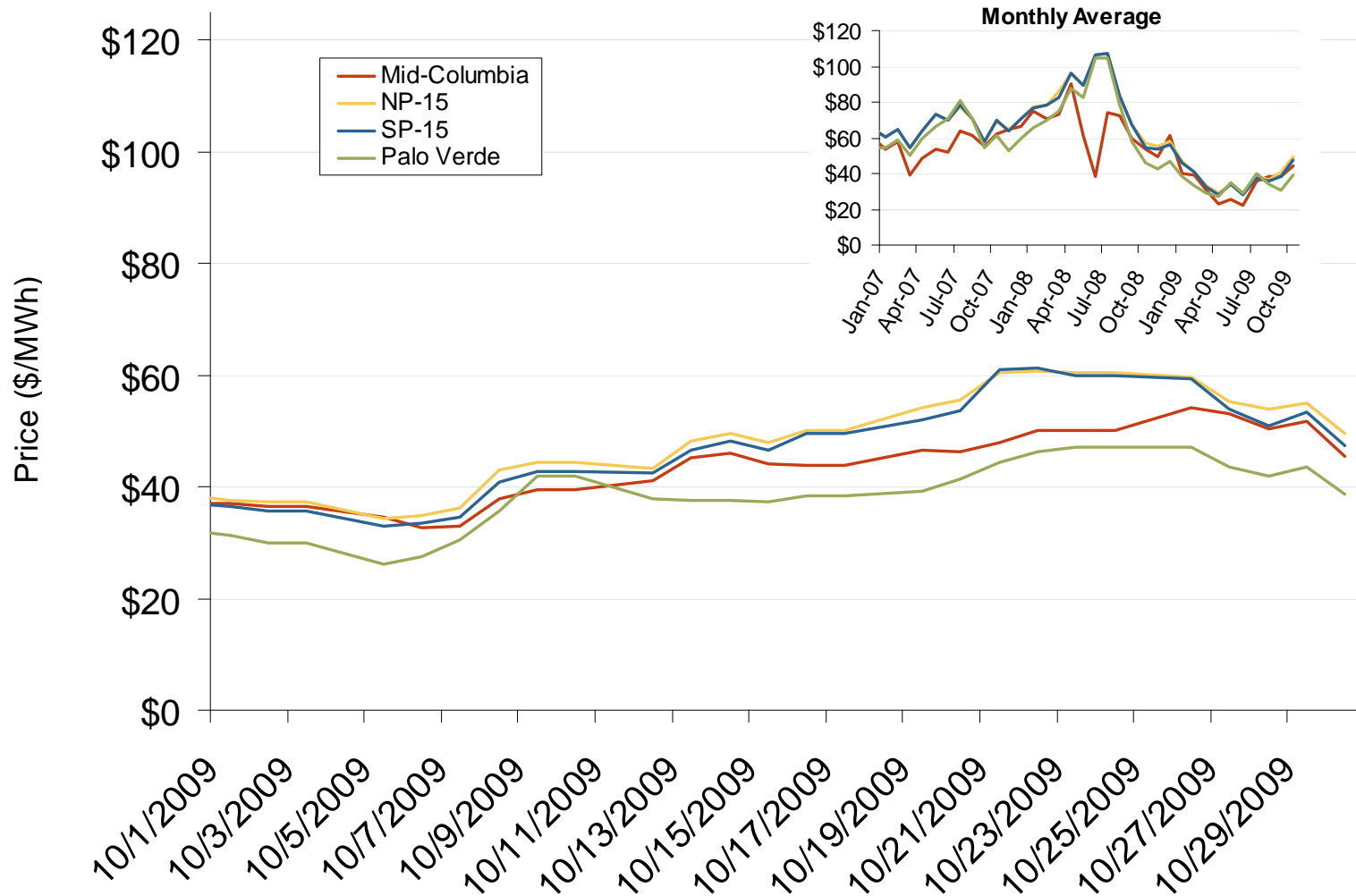


Source: Derived from Platts data.

Updated November 6, 2009

13020

# Western Daily Bilateral Day-Ahead On-Peak Prices



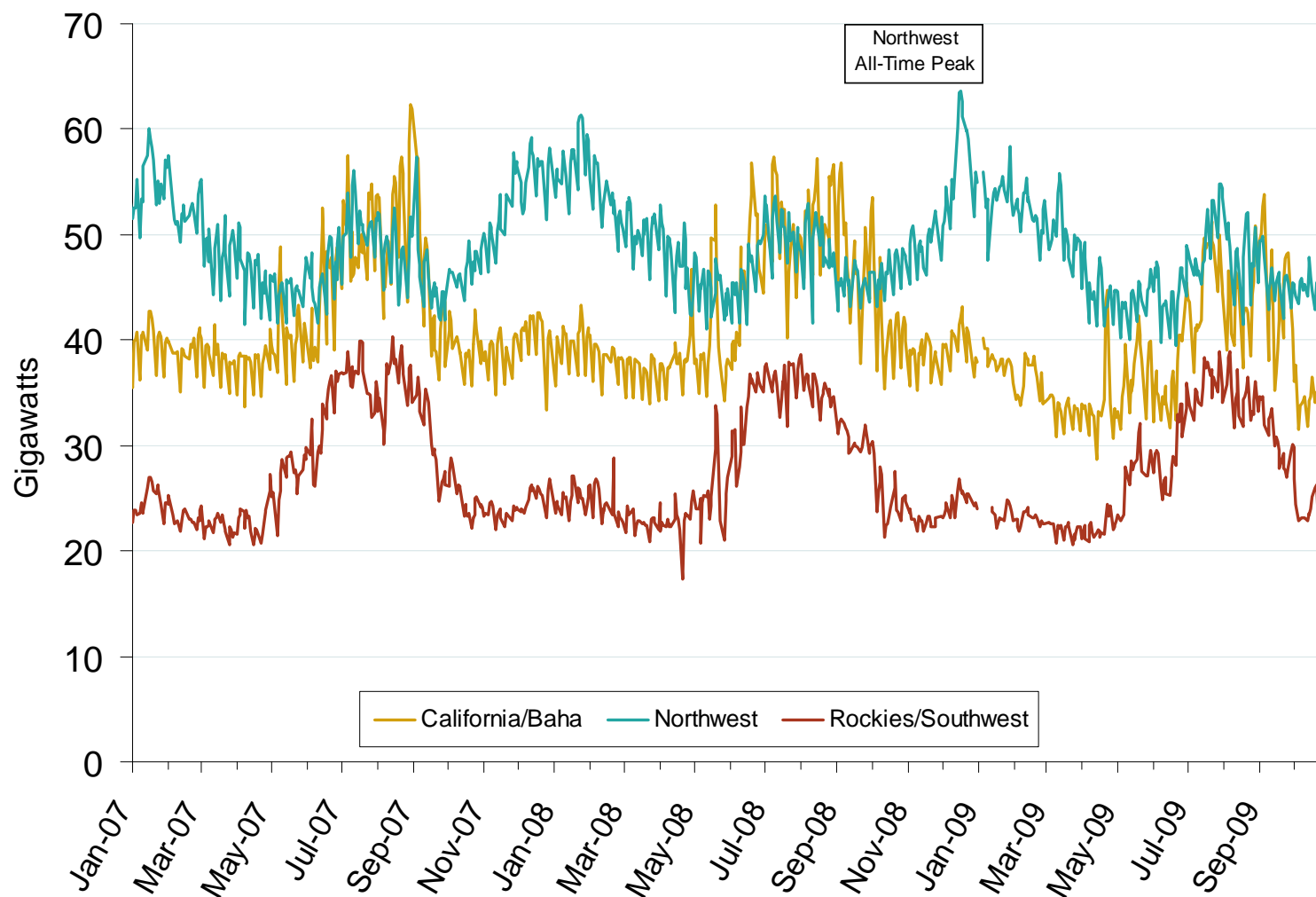
Source: Derived from Platts data.

Updated November 6, 2009

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## Northwest Electric Market: Daily Peak Demand

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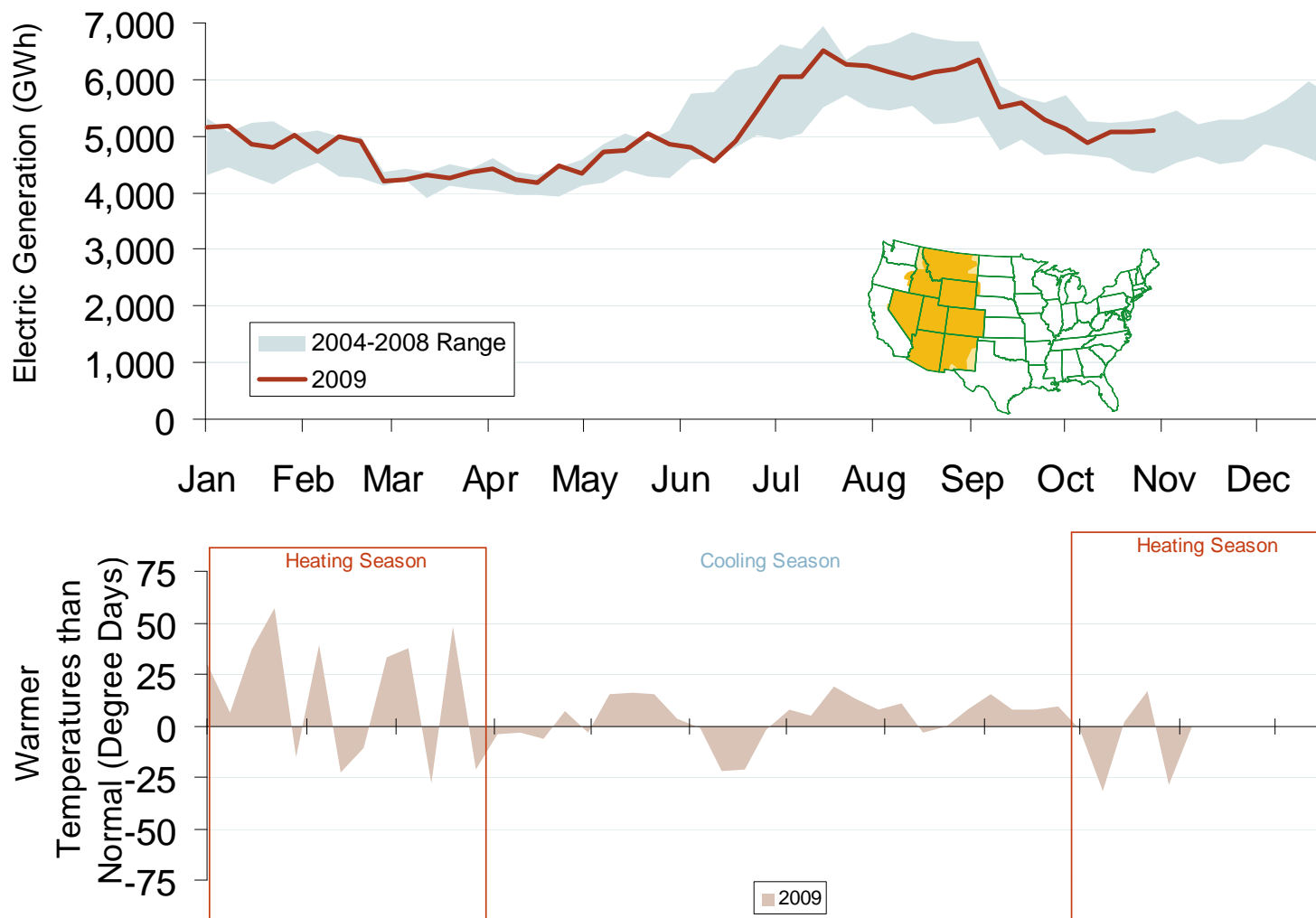
**Western Daily Actual Peak Demand**

Source: Derived from WECC Daily Report data available at <http://wecc.biz>. Data does not include weekends and holidays. Some data for 12/31/2008 – 1/9/2009 are not available from WECC.

Updated November 6, 2009

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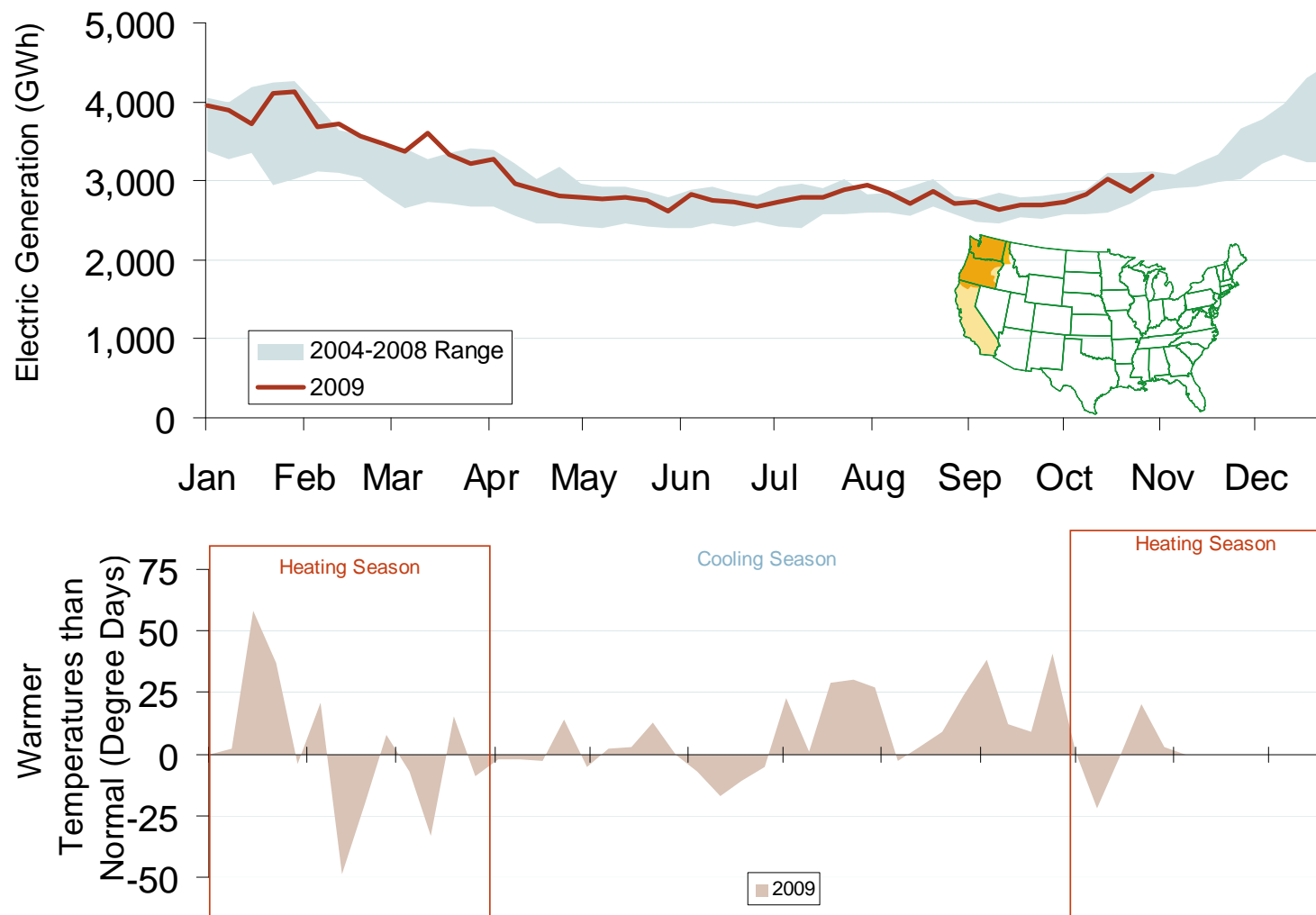
# Weekly Electric Generation Output and Temperatures Rocky Mountains Region



Source: Derived from *EEl* and *NOAA* data.

Updated November 6, 2009

# Weekly Electric Generation Output and Temperatures Pacific Northwest Region



Source: Derived from *EEl* and *NOAA* data.

Updated November 6, 2009

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## Pacific/Northwest Hydro and Snowpack Levels

	Hydro Generation		Snow Water Equivalent <sup>3</sup>		
	In-State Capacity (MW) <sup>1</sup>	Additional Capacity Created Downstream (MW) <sup>2</sup>	One Year Ago (% of average)	3/5/09 (% of average)	3/27/09 (% of average)
<b>Washington</b>	<b>21,500</b>	<b>0</b>	<b>130%</b>	<b>74%</b>	<b>90%</b>
<b>Oregon</b>	<b>9,100</b>	<b>0</b>	<b>145%</b>	<b>83%</b>	<b>100%</b>
<b>California</b>	<b>10,400</b>	<b>0</b>	<b>98%</b>	<b>88%</b>	<b>88%</b>
<b>Idaho</b>	<b>2,700</b>	<b>19,700</b>	<b>104%</b>	<b>83%</b>	<b>88%</b>
<b>Montana</b>	<b>2,700</b>	<b>16,200</b>	<b>110%</b>	<b>87%</b>	<b>94%</b>
<b>British Columbia</b>	<b>10,000</b>	<b>16,200</b>	<b>105%</b>	<b>85%</b>	<b>89%</b>

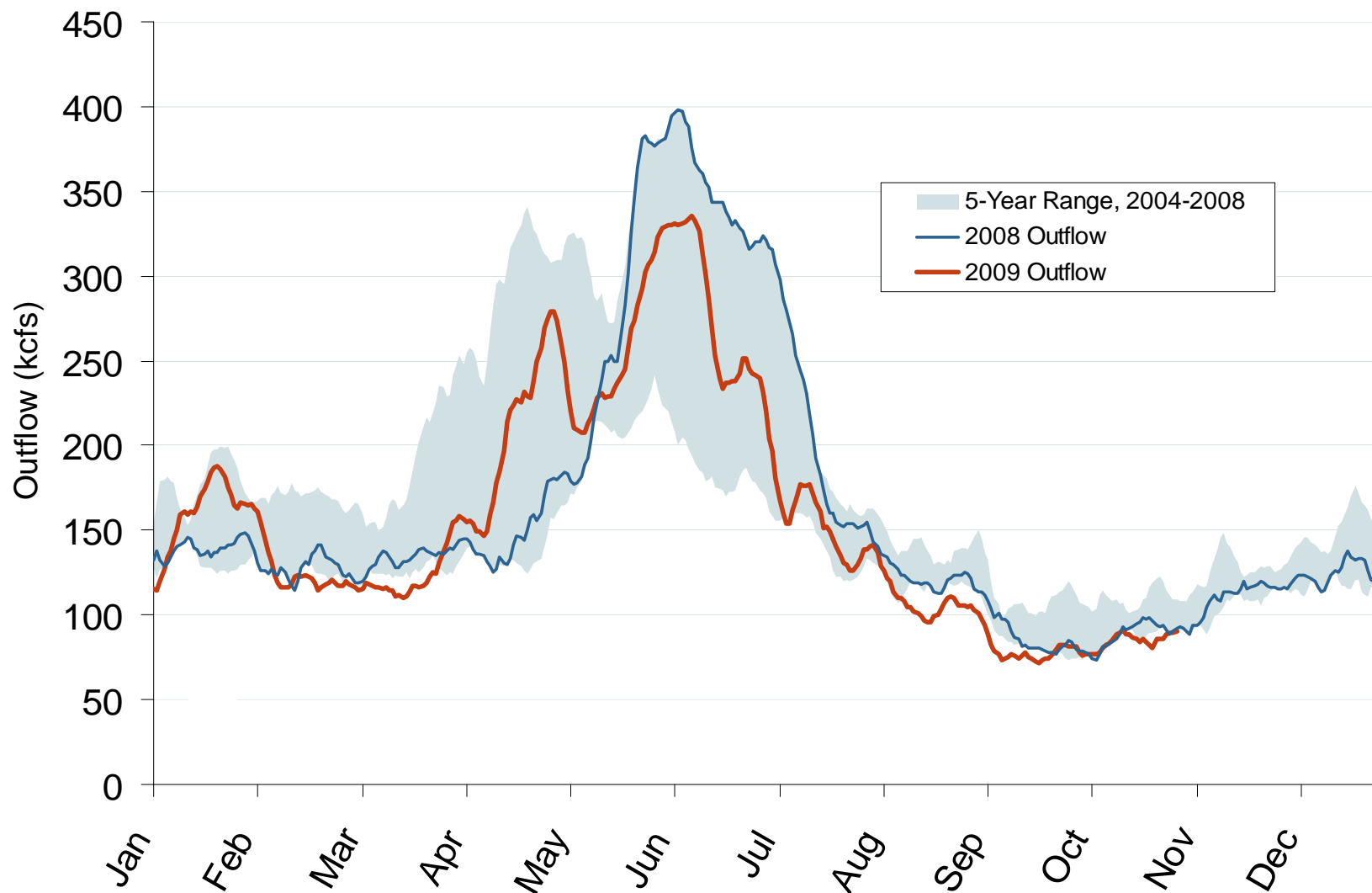
<sup>1</sup> Net summer capacity in megawatts by state (EIA).

<sup>2</sup> Approximate electric capacity created by water flow through the downstream states (EIA and BPA). The capacity estimates reflect the water flow pattern of the series of hydro facilities on the Snake and Columbia Rivers.

<sup>3</sup> Snow Water Equivalent, in percent of the historical average for the same date, is the ratio of current snow water daily data (collected by the Natural Resources Conservation Services' Snowtel Telemetry sites) compared to the average snow water for the same day between 1961-1990. Total Hydro Capacity figures by state do not tie precisely to Snow Water Equivalent data due to such factors as snow basin terrain and complex distribution of run-off to neighboring state hydroelectric dams or shared facilities (e.g., Columbia River hydroelectric dams on the border of Washington and Oregon) (Bloomberg, California Dept. of Water Resource and Government of British Columbia Ministry of Environment).

## Northwest Electric Market: The Dalles Dam Stream Flow

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**Stream Flow at The Dalles Dam**

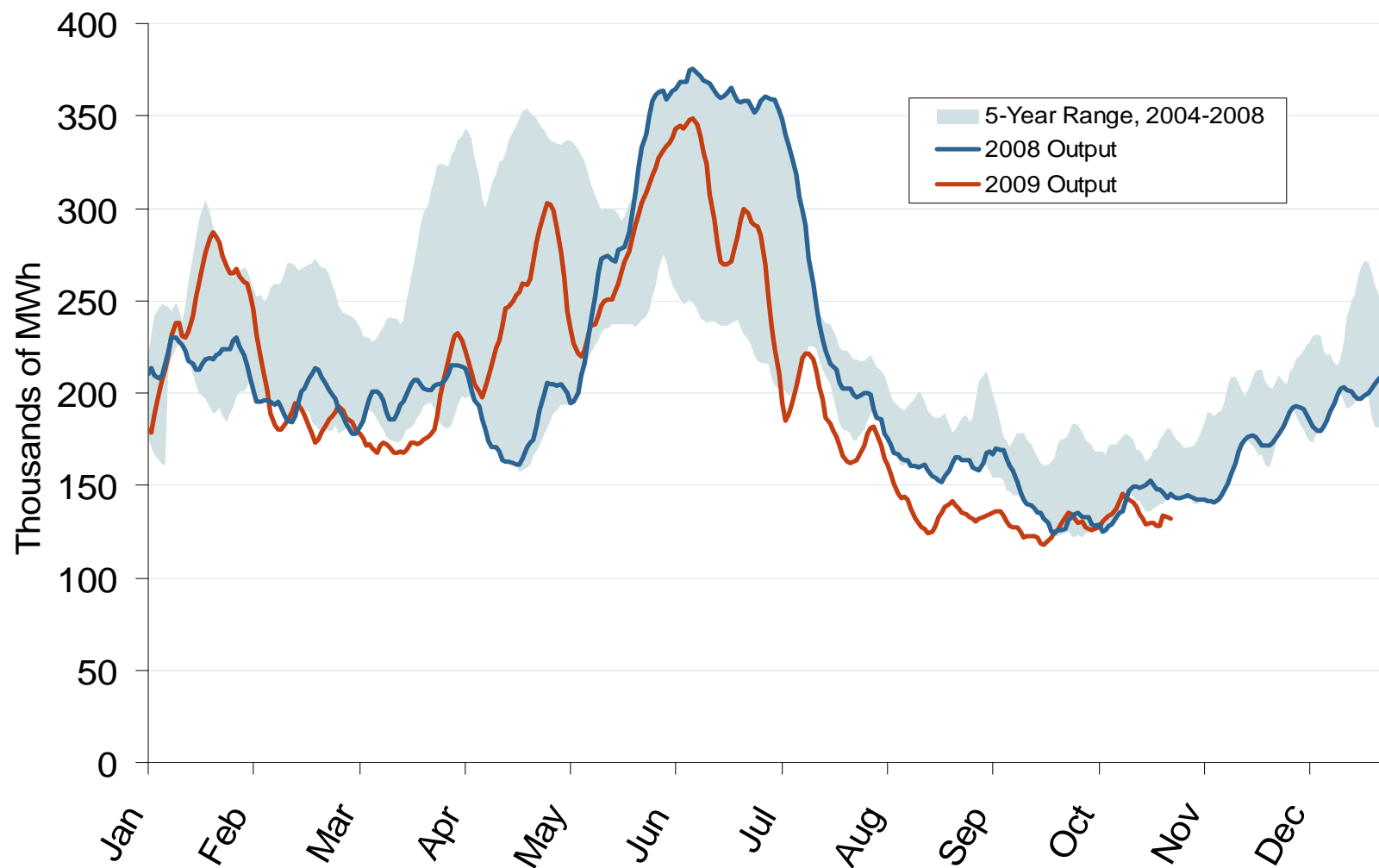
Source: Derived from USACE data.  
Trend lines are 7-day moving averages.

Updated November 6, 2009

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## Pacific Northwest Hydroelectric Production



Source: Derived from USACE data reflecting the output of the 24 largest facilities.  
Trend lines are 7-day moving averages.

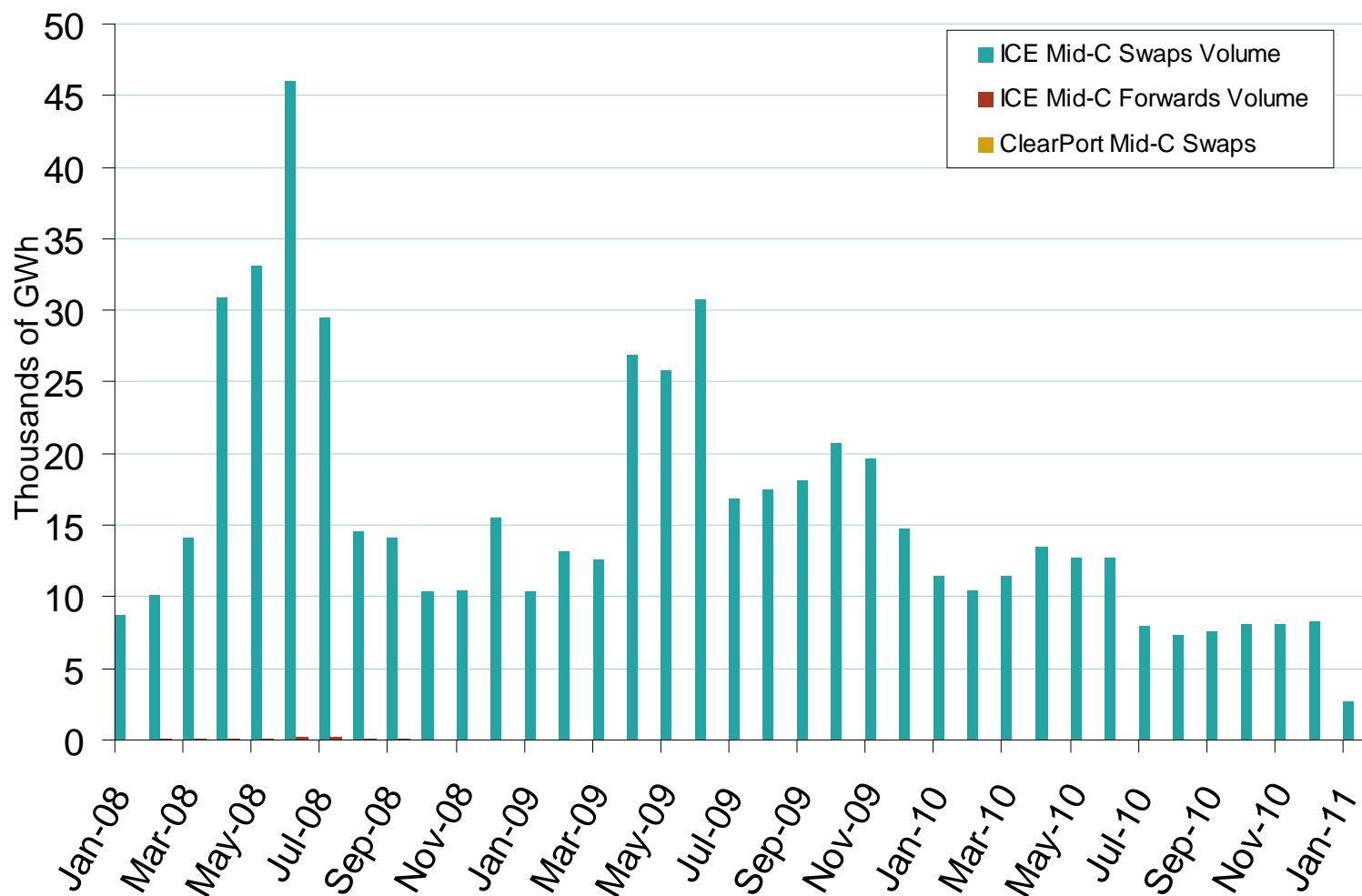
Updated November 6, 2009

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## Northwest Electric Market: Physical &amp; Financial Market Volumes

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## Mid-Columbia Forward and Swap Volumes



Source: Derived from ICE and Nymex ClearPort data. ICE on-peak forward (physical) and swap (financial) volumes are for Mid-Columbia and include monthly, dual monthly, quarterly, and calendar year contracts traded for each month. Nymex ClearPort on-peak swaps (financial) volume are for Mid-Columbia and are traded by month.

Updated November 6, 2009

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