

Bill Bradbury
Chair
Oregon

Henry Lorenzen
Oregon

W. Bill Booth
Idaho

James A. Yost
Idaho



Northwest Power and Conservation Council

Jennifer Anders
Vice Chair
Montana

Pat Smith
Montana

Tom Karier
Washington

Phil Rockefeller
Washington

April 1, 2014

MEMORANDUM

TO: Power Committee Members

FROM: John Fazio – Senior Power Systems Analyst

SUBJECT: Energy GPS briefing on availability of California Markets

One of the key elements in assessing the adequacy of power supplies in the Pacific Northwest is the amount of power imports from California that are reliably available during periods of stress in the Northwest. The Council's past resource adequacy assessments have assumed that no on-peak imports are available during summer, when California faces its highest loads. During winter, however, California typically has surplus power available to send north during our peak season.

For its resource adequacy assessment of 2017, the Council assumed a maximum availability of winter peak imports from California of 1,700 megawatts. This amount of supply is significantly lower than the south-to-north intertie transmission capacity of about 3,600 to 4,000 megawatts. The 1,700 megawatt assumption for the 2017 assessment was based on a cursory look at California load growth and issues surrounding its nuclear and once-through-cooling generating resources.

For the 2019 resource adequacy assessment, the Council recognized a need for a more rigorous assessment of the availability of power supply imports from California. To that end, the Council contracted with Energy GPS to assess the potential for imports to the Pacific Northwest from California during October 2018 through September of 2019.

In brief, Energy GPS report concludes that California is expected to have surplus power supplies available in excess of the south-to-north intertie capacity during October through June. The report also concludes that no surplus capacity is expected to be available during July through September.

Reliance on power imports from California should be based on their availability during periods of stress. The Council's Resource Adequacy Advisory Committee will review the Energy GPS report on April 4.

The Energy GPS report and the Resource Adequacy Advisory Committee's comments on the report will be presented at the Power Committee meeting on April 8.



Modeling the Potential for Southwest Imports

April 8, 2014
NW Power and Conservation Council
Power Committee Meeting
Spokane, Washington

Tim Belden
tbelden@energygps.com

1

Agenda

- Project Overview
- Important Trends
- Summary of Findings
- Key Uncertainties
- Review of the Modeling Techniques



2

Project Overview

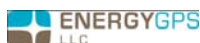
- Objectives:
 - Estimate monthly export potential from California to PNW by month for 2019.
 - Provide overview of California capacity planning process.
 - Develop model that can be used and improved upon in the future by NWPCC.
- Data: All publicly available data from CA Public Utility Commission, CA Energy Commission, EIA, BPA, FERC.
- Project limited to approximately 60 person-hours.



3

Important Trends

- Renewable build out driven by RPS.
- Excess energy from renewables placing downward pressure on prices.
- Low electricity prices place financial pressure on existing natural gas generation. No new merchant generation.
- Virtually all new/refurbished generation will be financed with long term PPA.
- Boom to bust merchant generation model gives way to regulatory planning model.
- Once through cooling units will refurbish if CPUC desires.
- Utilities are becoming vertically integrated again via contract.



4

Summary of Initial Findings

- CA should have surplus power to export to the PNW in all months except evening peak in July to September.
- Shortages will be driven by high coincident evening peak in CA and PNW. This happens in Q3.
- Little solar available during evening peak hours.
- Assumptions regarding availability of wind and solar important driver – especially during summer.
- Contracting and market friction associated with CA exports likely bigger concern than availability of supply.



5

2019 CA Load Resource Balance PNW Single Max Hour Scenario

	Intallted Capacity		Aug HE18 Capacity		Jan HE8 Capacity	
	MW	%	aMW	%	aMW	%
Demand Response	2,916	3%	0	0%	0	0%
Hydro	10,613	11%	6,012	8%	2,534	4%
Nuclear	2,323	2%	2,129	3%	2,203	4%
Natural gas	51,096	52%	43,909	60%	42,472	70%
Biomass, Geo, etc	4,201	4%	3,529	5%	3,529	6%
Wind	8,202	8%	2,154	3%	430	1%
Solar	15,997	16%	6,794	9%	213	0%
Pump Storage	2,943	3%	2,943	4%	2,943	5%
Other Storage	719	1%	719	1%	719	1%
Desert SW Imports	0	0%	5,496	7%	5,496	9%
Total	99,010	100%	73,684	100%	60,538	100%
Load			(67,262)		(42,377)	
Reserves			(5,038)		(4,187)	
Total			(72,300)		(46,564)	
Surplus			1,384		13,973	



6

Once Through Cooling Math

	MW
Total	20,400
SONGS	-2,200
Already Retired	-656
Remaining Today	17,544
Announced Retire	-1,985
Remaining Post Retirements	15,559
Newer OTC Generation	-2,317
Diablo Canyon	-2,300
Units to Refurbish or Retire	10,942



7

New Gas Generation by 2019

New Thermal Generation

Under Construction	3,015	90% success rate
SCE RFO	1,500	75% success rate by 2019
SDG&E RFO	600	75% success rate by 2019
Other	900	
Total	5,115	



8

New Wind and Solar by 2019

Significant additional capacity needed to fulfill RPS mandate of 31% of retail load by 2019 from current 20%. Most new generation will be in-state solar.

Additional GWh/Year Needed 35,373

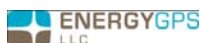
	MW	CF	% Of New	Change from Current
Additional Solar	13,786	24%	89%	623%
Additional Wind	1,714	33%	11%	26%
Additional Biomass/geo/other	48	84%	0%	0%
Total New Resources	15,548	26%	100%	



9

Additional Research

- California hydro peaking capacity during low water years. Very conservative assumptions in model right now.
- Refine estimates for Desert Southwest import estimates.
- Select exceedance levels for renewable generation during critical periods.
- Continue to refine thermal new build and retirements.



10

Questions

Tim Belden

tbelden@energygps.com

503-764-9120



11