

2009 Draft Resource Program

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For

Northwest Power and Conservation Council

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Outline

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- Needs Assessment
 - Annual Energy
 - Seasonal/Monthly HLH
 - 18-hour Capacity
 - Balancing Reserves
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- Resource Evaluation Results
- Proposed Actions
- Next Steps



Background

- BPA released the draft Resource Program on September 20, 2009, to analyze potential resource needs to meet power supply obligations under Regional Dialogue contracts, which go into effect in fiscal year 2012.
- The draft Resource Program examines BPA's potential power supply needs through 2019.
- The draft Resource Program has been prepared considering the draft Sixth Power Plan of the Northwest Power and Conservation Council. Any eventual long-term major resource acquisitions will be consistent with the Council's final Sixth Power Plan.
- Comments BPA receives by Nov. 30 will be considered in preparing the final Resource Program, scheduled for completion in FY 2010.

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Summary

- This draft Resource Program:
 - is a guide for BPA
 - provides information for customers about resources available to meet their needs for the near and long term
 - will help ensure that resource choices are consistent with the Council's Power Plan
- Recent events have diminished BPA's near-term resource need:
 - the current recession has lowered BPA's need for annual energy
 - new transmission operating procedures are expected to lower BPA's need for balancing reserves
- Therefore BPA expects to satisfy most of its anticipated short-term supply needs first with conservation and then with short-term power purchases from the market
- Any additional need for power in the longer term, depends in large part on a number of uncertainties, including:
 - customer choices, including public customers' above-HWM load placement
 - service to the DSIs
 - timing and strength of long-term economic growth, which will impact load growth
 - fish requirements that impact hydro generation
 - success of assumed conservation efforts

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Metrics

- Annual Average Energy at Critical Water
- Seasonal HLH Energy under low generation (typically low water) at 5th percentile (P5 by season roughly equates to monthly HLH at P10)
- 18-Hour Capacity
- Flexibility/Dispatchability
 - Must be able to meet reserve requirement (to integrate expected wind)

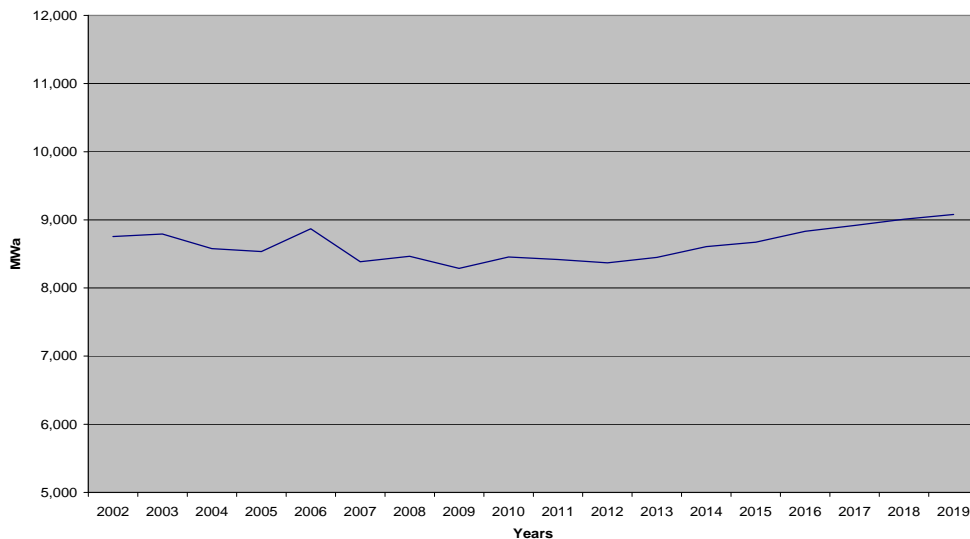
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Load Forecast

BPA Firm Obligation



	BPA Load-Following Entities	Non-Load-Following Entities
1999 to 2008	2.6%	0.9%
Stable forecast period: 2014 to 2019	1.5%	1.1%

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Annual Energy Results (Critical Water)

Deficit	2013	2019
All currently contracted load including above-HWM	-250	-950
All currently contracted load including above-HWM plus additional conservation	-75	-275
Current Tier-1 only (without above-HWM load)	0	0

- Does not include:
 - DSI load, service to new public agencies, additional service to DOE-Richland
 - Load growth uncertainty
 - Uncertainty in conservation (~100 MW range in 2013, ~300 MW range in 2019)
- Assumes no Tier 1 Augmentation (due to 168 MW headroom between 2010 forecast loads and the T1SFCO)

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Needs Assessment Results

- It appears that aggressive implementation of measures to meet public power's share of the conservation targets in the Council's draft Sixth Power Plan could address much of BPA's need for annual and seasonal Heavy Load Hour energy through 2013, depending on additional loads placed on the agency.
- In 2019, deficits are substantially greater
 - continued conservation efforts will meet a considerable portion of BPA's projected needs
 - conservation will not be sufficient in all load scenarios.
- BPA expects to continue to rely on short-term market purchases
 - up to 500 megawatts of summer power supply
 - up to 1,000 megawatts of peak winter power supply
 - short-term market purchases further diminishes remaining seasonal energy needs to be served by long-term resource acquisitions
- BPA continues to assess the capability of the FCRTS and the FCRPS to provide the necessary flexibility to produce required balancing reserves to meet all expected wind integration through 2019; however BPA could need additional balancing reserves by 2013 if wind power develops as expected and efforts to have others outside the BPA balancing authority provide balancing services prove unsuccessful.

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Conservation Assumptions and Range

	2013	2019
Conservation embedded in load forecast for Needs Assessment (53 aMW annually)	212	530
Additional conservation to meet draft 6 th Power Plan Targets	174	671
Total conservation to meet draft 6 th Power Plan Targets	386	1,201
Range of uncertainty in total conservation	354 to 451	1,101 to 1,401

- Table is for public power's share of conservation targets only

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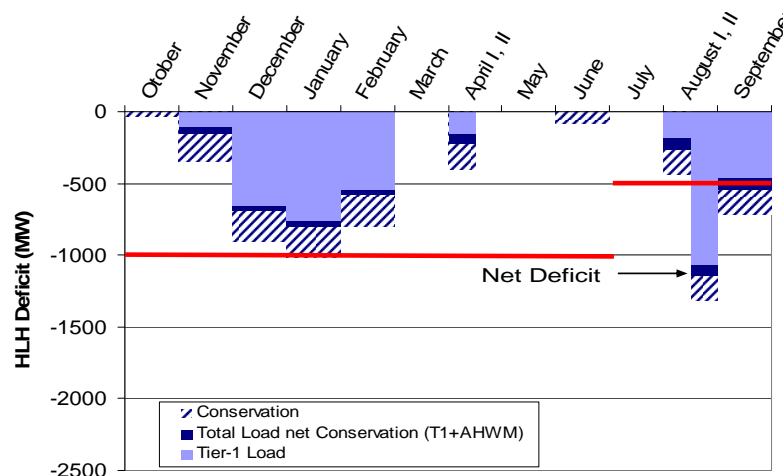


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2013 BPA Heavy Load Hour energy need at the monthly 10th percentile

The horizontal lines at -1000 MW and -500 MW (summer) reflect a tentative threshold for long-term (greater than 3-year) advance purchasing.

Deficits less than this threshold may be met by shorter-term purchases.



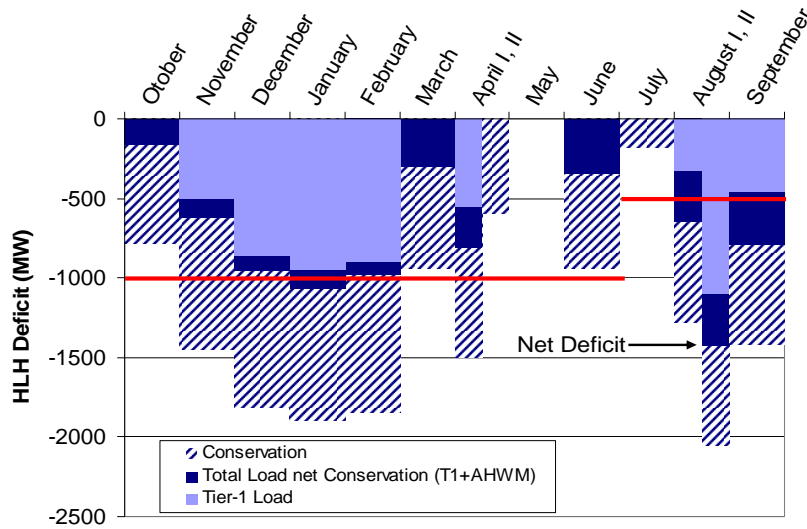
- Assumes Council's conservation targets will be met
- Does not include:
 - DSI load, service to new public agencies, additional service to DOE-Richland
 - Load growth uncertainty
 - Uncertainty in conservation

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2019 BPA Heavy Load Hour energy need at the monthly 10th percentile



- Assumes Council's conservation targets will be met
- Does not include:
 - DSI load, service to new public agencies, additional service to DOE-Richland
 - Load growth uncertainty
 - Uncertainty in conservation

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18-hour Capacity

- Extreme temperature event (1-in-10 year cold snap or heat wave) → High loads
- Median generation conditions (water, outages)
- 6 highest hours x 3 days (hours are not necessarily continuous: double peak in winter, single peak in summer)

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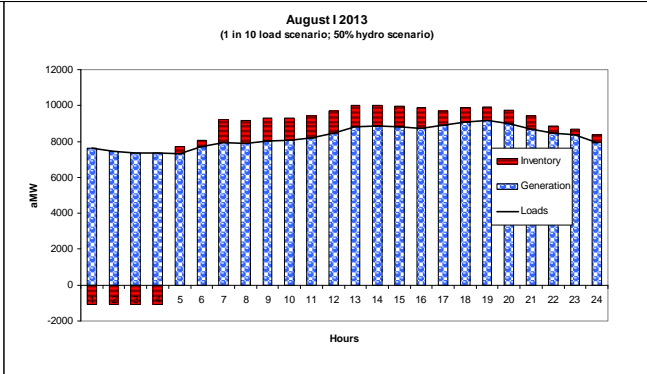
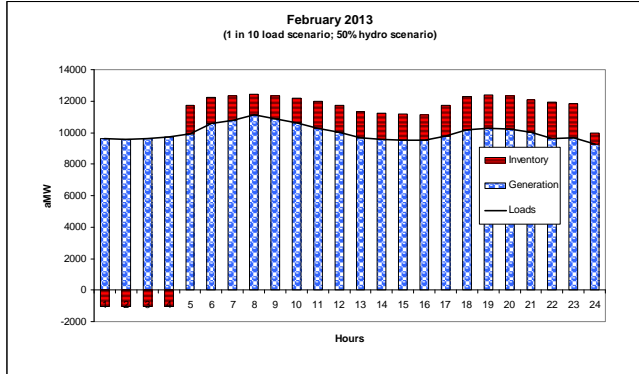


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Surplus 18-Hour Capacity 2013

February Cold Snap

August-I Heat Wave



18-hour Capacity: 1250 MW

18-hour Capacity: 700 MW

- Does not include weather-responsive load uncertainty (up to 750 MW), load growth uncertainty, additional conservation, potential new load (DSI, new publics, expanded DOE-Richland)
- Tier 1 and above-HWM load included

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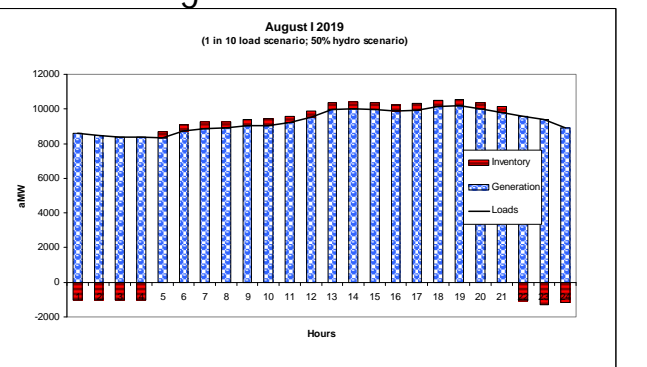
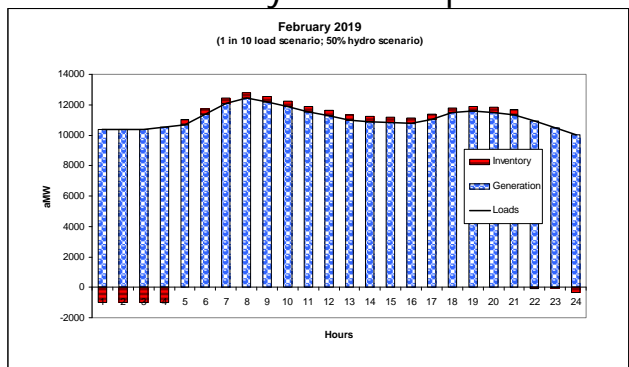


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18-Hour Capacity 2019: Essentially Load/Resource Balanced

February Cold Snap

August-I Heat Wave



18-hour Capacity: 250 MW

18-hour Capacity: 300 MW

- Does not include weather-responsive load uncertainty (up to 750 MW), load growth uncertainty, additional conservation, potential new load (DSI, new publics, expanded DOE-Richland)
- Tier 1 and above-HWM load included

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Balancing Reserves for wind and load

	2013	2019
Wind Fleet Nameplate	5070 growing to 6220	About 11,000
INC (MW) required	1551 growing to 1763	2250
DEC (MW) required	-2076 growing to -2377	-3070
INC modeled	All	Capped at 1763
DEC modeled	Virtually all	Capped at -2377

- Uses 60-minute persistence accuracy wind forecasts
- Does not include uncertainty in wind fleet size
- Modeling assumes BPA and region succeed in efforts to reduce level of reserves FCRPS must supply after 2013
- Note: does not include impact of deployment of the reserves; BPA is examining further

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Uncertainties Will Affect BPA Obligations

- Above-HWM and Resource Support Services elections
- Potential load from new publics, DSI load and increased DOE-Richland
- Does not address long-term economic growth, long-term load growth, or conservation uncertainty

	2013	2019
A-HWM	250	950
DSI	477	477
New Publics	50	200
DOE Richland	5	70

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Additional Uncertainties

- Amount of growth of wind in BPA balancing authority area
- Biological Opinion ruling
- Water conditions
- CGS performance
- Natural gas markets
- Climate change legislation

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Resource Needs

Forecast Need Type	Forecast Need FY 2012-2019*
Annual Energy	<ul style="list-style-type: none"> • No near-term need and small need toward FY 2019.
Monthly/Seasonal HLH	<ul style="list-style-type: none"> • Moderate need, increasing with load growth
Balancing Reserves	<ul style="list-style-type: none"> • Need increasing from small(FY 2014) to substantial (FY 2019)

*Net of planned conservation and short-term market purchases. Needs will be larger if BPA serves DSI loads, new publics, or additional DOE Richland load.

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Generating Resources to Address Needs after all Cost-effective Conservation

Resource Evaluation Results

Forecast Need Type	Candidate Resources*
Annual Energy	<ul style="list-style-type: none"> • Incremental federal and non-federal hydro system improvements • Small nameplate capacity renewable generation (5-50 MW increments capacity) • Cogeneration and waste heat use for thermal load
Monthly/Seasonal HLH	<ul style="list-style-type: none"> • Combined- or simple-cycle combustion turbine • Pumped Storage
Balancing Reserves	<ul style="list-style-type: none"> • Combined- or simple-cycle combustion turbine • Reciprocating engines / Internal combustion turbines • Incremental increases in flexibility of federal hydro system from improvements or, potentially integrating pumped storage.

*Resources not listed in order of cost-effectiveness or preference.

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Proposed Actions

- Work with customers and regional stakeholders to achieve all cost-effective conservation measures necessary to meet public power's share of the Council's Sixth Power Plan regional conservation targets.
- Rely on risk-managed wholesale power market purchases.
- Focus on efforts underway to increase the flexibility of transmission grid operation to support variable power sources
- Monitor progress and continue to support research and development of other of relevant emerging technologies, such as Smart Grid and demand response
- Monitor the areas of uncertainty noted above, in order to adapt our resource acquisition strategies as necessary.
- Assess and identify cost-effective small-scale renewable and cogeneration resources in the Northwest considering customer interests and BPA resource needs.
- Evaluate and appropriately pursue pumped storage and natural gas-fired resources, such as combined cycle combustion turbines and reciprocating engines, to provide seasonal heavy load hour energy or balancing reserves.

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Next Steps

- Workshop October 14, 2009
- Close of comment November 30, 2009
- Ensure consistency with Council's final Sixth Power Plan
(Council is accepting comments through November 6, 2009)
- BPA's final Resource Program released 2010

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