

# Net Secondary Revenue Forecast Methodology

Proposed Refinements for BP-18 Rate Proceeding

Public Power Council

Industrial Customers of Northwest Utilities

# Background and Context

- BPA models Net Secondary Revenue stochastically based on a large number of scenarios
- Current BPA methodology prices all secondary sales at Mid-C projected by AURORAxmp
- In practice, BPA makes significant sales to points of delivery in California at premiums above Mid-C
- Sales are supported by large investment by BPA power in long-term firm service on the Southern Intertie

# Background and Context (continued)

- PPC and ICNU testimony (JP-07) in BP-16 proposed a \$25.4 million adjustment to account for the value of sales to California based on analysis of historic sales data
- BPA did not adopt the JP-07 adjustment, but did implement an ad hoc \$10 million increase
- Final ROD also committed to evaluate the NSR forecast methodology ahead of BP-18
- BPA solicited customer proposals for methodology

# Goals for NSR Methodology Refinement

- Accurate forecast of net secondary revenues on an average basis
- Matching benefits and costs of assets and sales opportunities
- Risk informed consistent with BPA's current methodology
  - Inventory
  - Price spreads
  - Transmission availability
- Sustainable and not analytically burdensome after initial implementation

# PPC/ICNU Proposal

- Maintain basic structure of BPA approach
  - 3200 iterations with inventory, prices, etc for each monthly diurnal period (HLH/LLH)
- Add pricing nodes for Northern California (COB/NP-15) and Southern California (NOB/SP-15) in addition to Mid-C
- In each iteration, prioritize sales for each monthly diurnal period based on highest price
  - CA sales limited by intertie availability (evaluated stochastically)
  - Remaining inventory sold at Mid-C

# Evaluation of Results

- Methodology implemented in “NSR Model” Excel spreadsheet posted by BPA on 10/21/15
- Baseline NSR forecast of approximately \$303 million for FY 2016 based on BP-16 inputs
- Revised methodology produces \$325 million
  - 23% of inventory sold to CA representing 33% of revenues
- Conservative outcome, but reasonably consistent with historic actual results
- Meets goals of a risk informed and analytically sustainable approach

# Next Steps

- Take feedback and address questions
- Provide BPA with additional written documentation
- Ongoing collaboration and engagement with BPA staff
- Incorporate further refinements and move towards implementation for BP-18 Initial Proposal

# Technical Details



# Summary of Changes to NSR Model:

- Model now includes three “sets” of prices: Mid-C, Northern California (weighted average of COB and NP-15), henceforth “NCA” and Southern California (SP-15), henceforth “SCA”.
- Model now makes pairwise comparisons between prices to generate binary decision variable matrix across iterations and periods.
- Model now uses binary decision variables to determine which location to “sell to” first, then second, then third.
- Model now constrains the amount of power that can be sold to either California point of sale by the transmission capacity of the lines.
- Revenues are now calculated for each point of sale, then summed and adjusted for Purchase Expense to give Net Secondary Revenue.

# Basic Decision Logic Flow

- First, the model makes pairwise comparisons: Mid-C vs. NCA; Mid-C vs. SCA; NCA vs. SCA. The model checks these outcomes to determine whether surplus is sold to a given location.
- If NCA or SCA has the highest price for a given iteration of the period, the model first “sells” surplus up to the “transmission cap” for that point of sale. That “cap” is defined by the ratio of the line rating for that iteration and period to the maximum rating, multiplied by the BPA reservation for that line.
- The model takes the remaining surplus after the first “sale” and sells to either Mid-C or the remaining California point of sale.
- If any surplus remains after selling to both California points of sale, the remainder is sold to Mid-C.
- If at any point in the logic flow Mid-C has the highest remaining price, all remaining surplus is sold to Mid-C. This is because there is no “transmission cap” assumed for Mid-C, and it is assumed that BPA would prefer to sell as much power as it can locally rather than out of region, if the price is higher locally.
- NSR is calculated as described in the previous slide from these sales totals. An average across all iterations is then calculated and output to a summary tab. This is repeated for all 12 months of the fiscal year.

# Sample Calculations

Assume: All lines rated at 90% of maximum rating, reservation is 700 MW for NCA and 300 MW for SCA, so constraint is  $(0.9 \times 700) = 630$  MW for NCA and  $(0.9 \times 300) = 270$  MW for SCA.

Inv.	Price Mid-C	Price NCA	Price SCA	R1 Sales NCA	R1 Sales SCA	R2 Sales NCA	R2 Sales SCA	Sales Mid-C	Rev. NCA	Rev. SCA	Rev. Mid-C	Total Rev.
1200	\$28	\$30	\$32	-	270	630	-	100	\$18900	\$8640	\$2800	<b>\$30340</b>
1200	\$28	\$32	\$30	630	-	-	270	100	\$20160	\$8100	\$2800	<b>\$31060</b>
1000	\$30	\$28	\$32	-	270	-	-	730	\$0	\$8640	\$21900	<b>\$30540</b>
1000	\$30	\$32	\$28	630	-	-	-	370	\$20160	\$0	\$11100	<b>\$31260</b>
800	\$32	\$28	\$30	-	-	-	-	800	\$0	\$0	\$25600	<b>\$25600</b>
600	\$30	\$32	\$28	600	-	-	-	-	\$19200	\$0	\$0	<b>\$19200</b>
200	\$28	\$30	\$32	-	200	-	-	-	\$0	\$6400	\$0	<b>\$6400</b>

# Questions and Contact

- Please feel free to contact us with any questions or suggestions:

Michael Deen

Senior Policy Analyst

Public Power Council

(503) 595-9774

[mdeen@ppcpdx.org](mailto:mdeen@ppcpdx.org)