Secondary Revenues Public Workshop

Bonneville Power Administration

October 20, 2015

Purpose

- Demonstrate how BPA calculates Net Secondary Revenues (NSR).
- Emphasis on **methodology** here.

For each iteration

1. Calculate Federal System Firm Obligations
   - Omit Slice Right to Power (SRTP)
2. Calculate SRTP
3. Sum SRTP and loads from step 1
4. Introduce load variability
5. Aggregate resources
6. Subtract losses from resources
7. Calculate position (surplus / deficit)
   - First transform aMW into MWh
   - Take product of MWh and Aurora prices
8. Sum revenues and expenses to arrive at NSR

Federal Loads net of Slice

As an example consider Iteration 1 (HLH only)

- Tier 1 Slice Block
- Tier 1 Block
- Load Following Tier 1 System Shape Load

} Preference Loads (net of Slice)

- Industrial
- Intra - Regional Transfers - (Out)
- Exports
- USB Obligations

Month	Pref. Loads	L. Follow	Risk	Pref. Loads$_n$	DSI	Transfers	Ex	USB	Fed. Loads
Oct	6,446	2,974	1.03	6,593	91	14	838	60	**7,541**
Nov	8,188	3,668	1.05	8,366	95	231	899	30	**9,621**
Dec	8,525	4,005	1.06	8,782	87	229	858	26	**9,982**
Jan	8,271	4,056	0.95	8,063	94	237	891	29	**9,315**
Feb	7,683	3,682	0.94	7,480	90	220	835	25	**8,650**
Mar	7,152	3,296	0.98	7,095	88	112	824	43	**8,162**
Apr	6,420	3,150	0.99	6,402	91	119	828	267	**7,706**
May	7,522	3,167	0.97	7,431	94	15	884	288	**8,713**
Jun	6,894	3,180	0.98	6,844	88	14	824	330	**8,099**
Jul	7,365	3,595	0.95	7,192	93	16	910	333	**8,545**
Aug	7,136	3,409	0.94	6,924	91	15	928	256	**8,214**
Sep	6,573	3,127	0.96	6,456	87	13	848	206	**7,609**

Resources

Fixed

- Small Hydro
- Non - federal CER
- Intra - Regional Transfers - (In)
- Trading Floor Forward Purchases
- Imports
- Cogen
- Solar
- Klondike III

Gamed

- Hydro
- Hydro Shift Adjustment
- Slice Loss Return
- Wind
- CGS

Federal Resources

Month	Hydro	Hydro Adj.	Wind	CGS	Slice Loss Return	Other	Fed. Res.	w/ losses
Oct	7,016	-74	29	1,107	37	307	8423	**8,173**
Nov	8,728	-175	34	1,100	44	304	10034	**9,736**
Dec	9,153	-155	39	1,109	47	297	10489	**10,177**
Jan	13,829	29	36	1,098	69	309	15370	**14,913**
Feb	12,850	-108	16	1,099	65	296	14217	**13,794**
Mar	12,693	-113	36	1,099	65	323	14103	**13,684**
Apr	12,068	-245	51	1,104	60	308	13346	**12,950**
May	13,728	-8	43	1,106	68	297	15234	**14,782**
Jun	13,580	-53	70	1,018	68	312	14995	**14,549**
Jul	13,466	-81	26	1,088	67	429	14996	**14,550**
Aug	10,312	-236	45	1,080	51	428	11679	**11,332**
Sep	7,210	-36	68	1,049	37	420	8748	**8,488**

Slice Right to Power (SRTP)

Slice Right to Power is an obligation that depends on risk-informed Federal Resources.

SRTP =

$$
\begin{aligned}
&SRTP_{firm} + \\
&(Hydro_{\Delta} + SliceLossRet_{\Delta} + CGS_{\Delta} + Wind_{\Delta}) * \\
&(1 - TxLoss)(Slice\%)
\end{aligned}
$$

Slice Right to Power (SRTP)

Month	Hydro_{Δ}	Wind_{Δ}	CGS_{Δ}	$\text{Slice Loss Return}_{\Delta}$	SRTP_{Δ}	Slice Firm	SRTP_{n}	SRTP_{Δ}
Oct	307	-17	32	2	84	1,840	1,923	84
Nov	-836	0	25	-3	-211	2,501	2,290	-211
Dec	517	2	34	3	144	2,278	2,422	144
Jan	6631	5	23	33	1728	1,940	3,669	1728
Feb	5458	-2	24	27	1422	1,971	3,393	1422
Mar	5679	-17	24	29	1476	1,899	3,376	1476
Apr	5692	3	29	29	1486	1,630	3,116	1486
May	2661	2	31	13	699	2,908	3,607	699
Jun	4632	8	-57	23	1190	2,356	3,546	1190
Jul	5036	-17	13	25	1306	2,188	3,494	1306
Aug	1909	0	5	10	497	2,151	2,649	497
Sep	548	15	-26	2	139	1,797	1,936	139

$$SRTP_{\Delta} = (Hydro_{\Delta} + Wind_{\Delta} + CGS_{\Delta} + SliceLossRet_{\Delta}) * (1 - TxLoss)(Slice\%)$$

$$SRTP_{n} = SRTP_{\Delta} + SRTP_{Firm}$$

Calculating Position

$$Pos_t = R_t(1 - TxLoss) - L_t - SRTP_{\Delta t}$$

Month	Resources	Loads	$SRTP_{\Delta}$	Position	Price	Hours	Revenue
Oct	8173	7,541	84	548	37.08	432	8,782,453
Nov	9736	9,621	-211	326	35.24	384	4,406,451
Dec	10177	9,982	144	52	37.52	416	815,610
Jan	14913	9,315	1728	3871	22.32	400	34,561,631
Feb	13794	8,650	1422	3722	19.68	400	29,293,159
Mar	13684	8,162	1476	4047	20.16	432	35,237,344
Apr	12950	7,706	1486	3759	16.77	416	26,219,359
May	14782	8,713	699	5370	14.92	400	32,051,621
Jun	14549	8,099	1190	5261	11.83	416	25,897,292
Jul	14550	8,545	1306	4700	17.30	400	32,523,102
Aug	11332	8,214	497	2621	22.03	432	24,949,903
Sep	8488	7,609	139	740	29.16	400	8,626,973
							$263 million

$\rightarrow$ note that L_t includes firm SRTP, so we only need to include $SRTP_{\Delta}$.