

RHWM Process Workshop

BP-18 Rate Period – Preliminary Outputs

Rates Hearing Room

May 10, 2016

Call in number: (877) 336-1828 Passcode: 2906902 #

[Join WebEx meeting](#)

Meeting number: 997 004 665

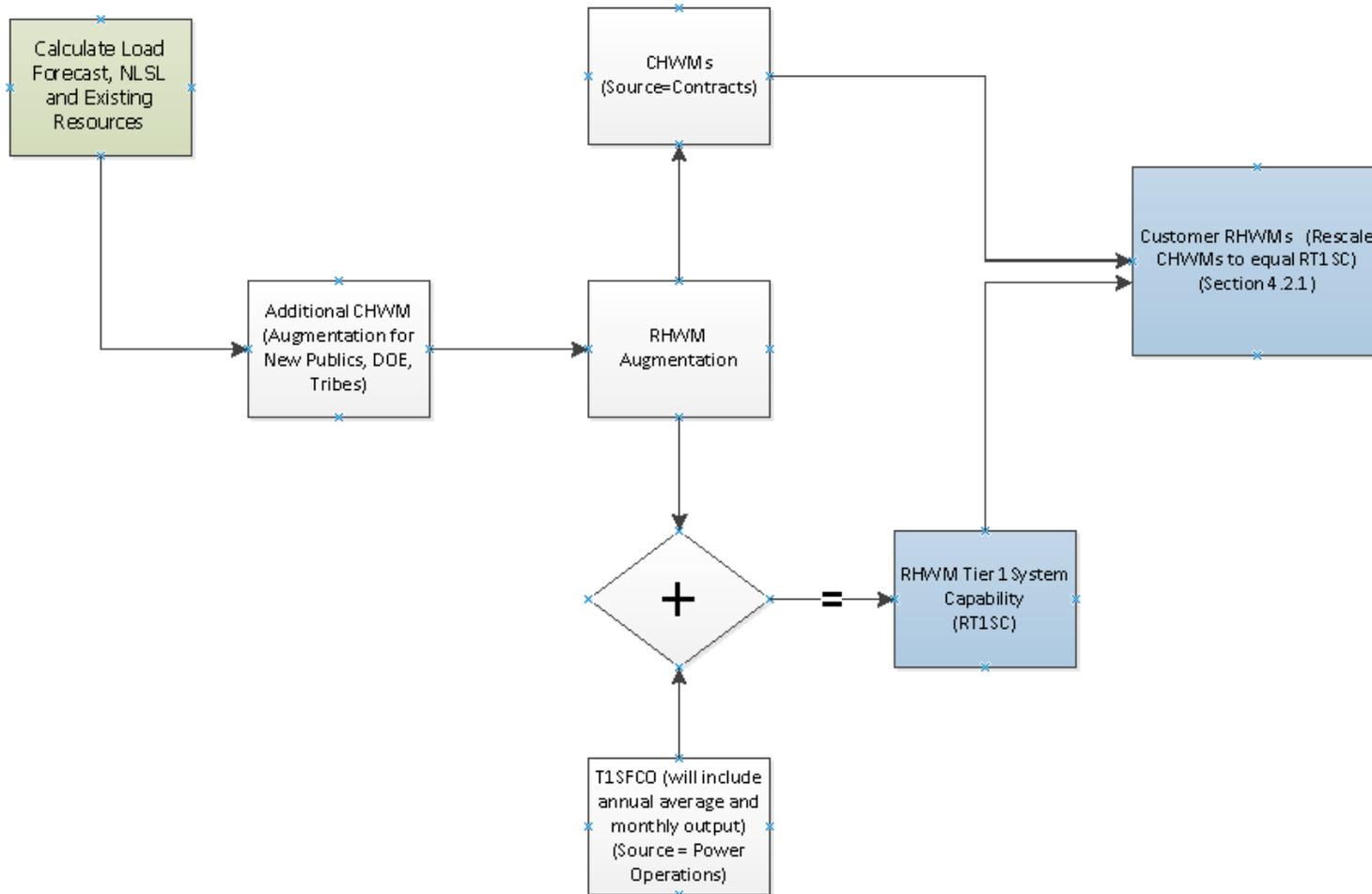
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RHWM Process Workshop Agenda

Topic	Presenter
Introductions and Purpose of Workshop	Lindsay Bleifuss
Load Forecast Update	Reed Davis
Tier 1 System Firm Critical Output (T1SFCO):	
• Hydro Study Results	Tyler Llewellyn
• T1SFCO Study Results	Tim Misley
RHWM Augmentation	Lindsay Bleifuss
Effects on Rates	Peter Stiffler
Other Topics	All
Next Steps	Lindsay Bleifuss

RHWM Process*

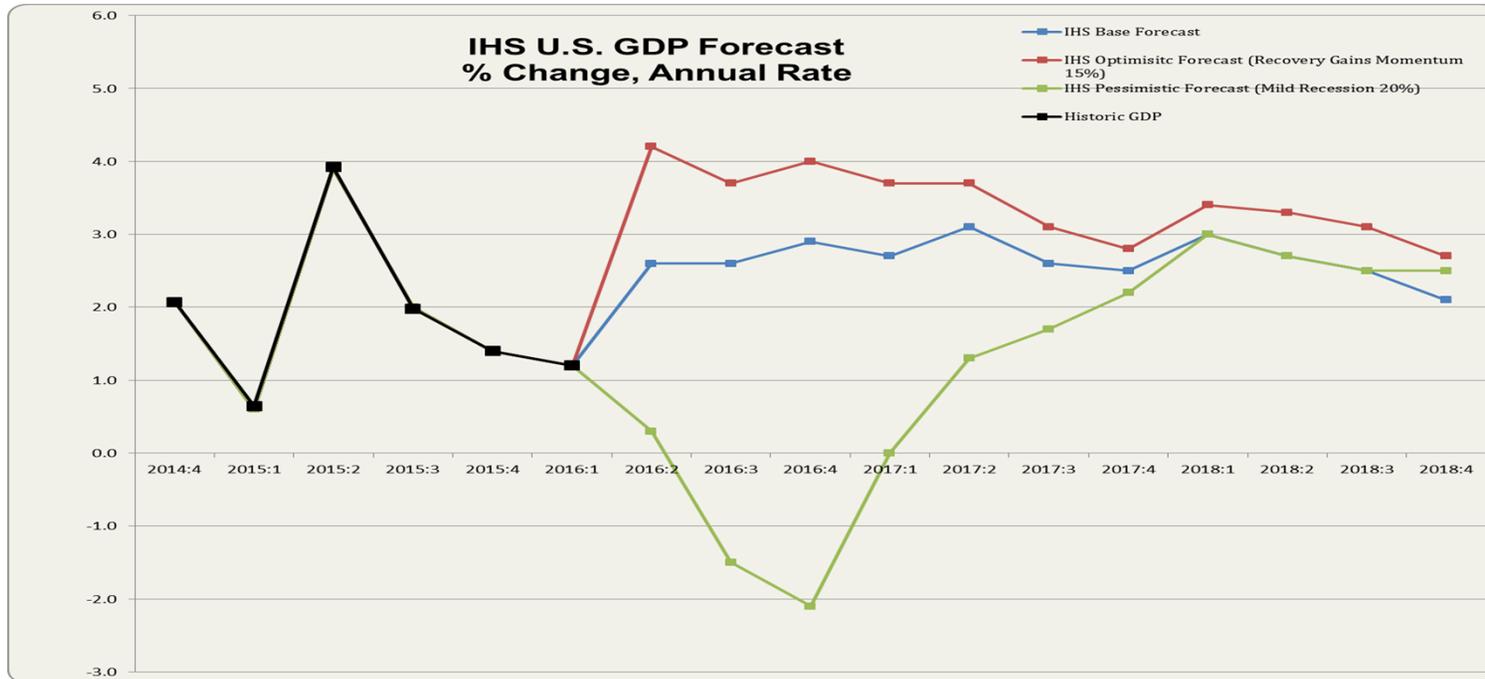


*For more details about the Rate Period High Water Mark (RHWM) process and calculations, please refer to section 4.2.1 of the Tiered Rate Methodology (TRM)

Load Forecast Update for BP-18 RHWM Process

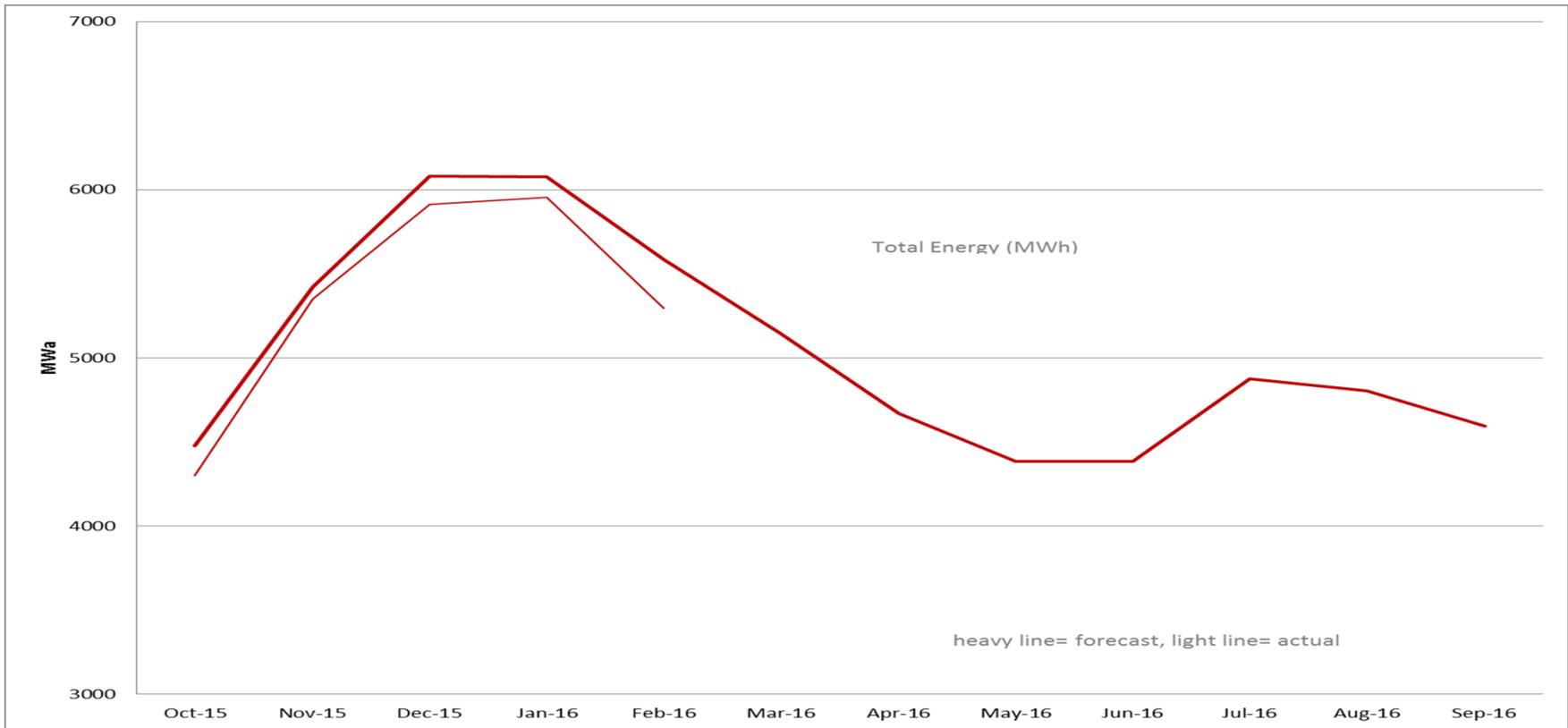


Forecasted Economic Conditions Continue from Last Year



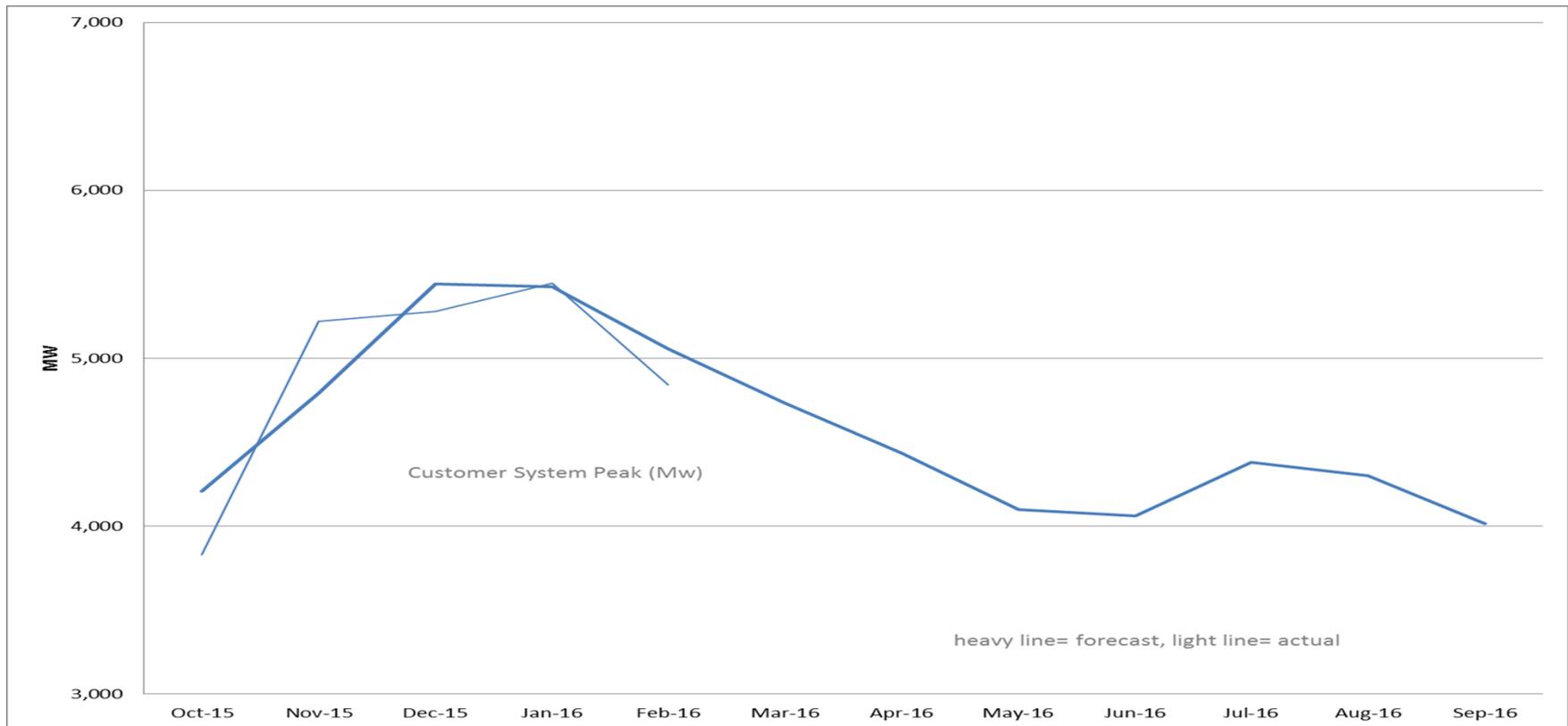
- Somewhat positive GDP growth is still expected for the nation
- Regional unemployment has improved, under-employed or employee re-entry to workforce will be a drag on growth.
- Load continues with little significant growth
- World economic concerns continue
- Regular economic reports continue to indicate uncertainty as reports cycle between positive and negative updates

Current Models - Energy



- Actual energy is consistently below forecasted, indicating some reductions are expected.

Current Models - Peaks



- Demand models are performing well after compensating for the ups and downs of the weather.

Forecasted Agency Loads Continue as Planned Last Year

	MWa				
	2016	2017	2018	2019	2020
Prior forecast (May 2015)	9,152	9,261	9,388	9,495	9,576
Current Forecast (Mar 2016)	8,978	9,129	9,244	9,361	9,459
change	-173	-133	-143	-134	-117
% change	-1.9%	-1.4%	-1.5%	-1.4%	-1.2%

- Downward bias in forecast adjustments
 - ~30% of the customers increased forecast over last year's levels, ~ 70% reduced forecasts
 - Average change about 1 aMW per customer

- Bulk of changes are the results of anticipated specific large customer adjustments with 80% of change coming from a few customers.

Updates Considered Since Feb 2016

Principles guiding changes

- Avoid subjective bias in results
 - Make changes with a clearly identifiable cause and effect.
 - Avoid making changes within the tolerance of model errors, i.e. changes less than 5%.
 - Rely on models and results put together when consequences are not immediately pending.
- Avoid forcing the models to give specific answers
 - Rely on statistics of models
 - Rely on accuracy of models and improve when results are not within accuracy tolerance levels.
 - Avoid updating without sufficient new data
- Incorporate highly probable information
 - Include new loads/projects that have higher than 70% probability of occurring.

Load Forecast Next Steps

- Customers provide notice of additional changes - ASAP, please.
 - Submit forecast change request (including cause and amount) on BPA.gov comment page.
- BPA forecaster to review and include necessary changes by June 10, 2016
- Communicate changes incorporated by June 20, 2016
- Deliver updated data for continued processing by July 1, 2016

Hydro Study Results and T1SFCO



Hydro Study General Updates

Pacific Northwest Coordination Agreement (PNCA) Project Data

- Updated based on 2016 PNCA data, with a couple of additional updates that will be part of next year's PNCA data. These updates include:
 - New Grand Coulee storage table
 - New Hungry Horse H/K table
 - New Grand Coulee pumping data

Canadian Operations

- Updated based on the 2018 Assured Operating Plan (AOP18) completed under the Columbia River Treaty. AOP19 is a roll-over year. These were the first AOPs created using the 80-year Modified Flows.

Project Outages

- Updated based on the latest long term maintenance and capital program forecasts.

Reserves

- Updated FCRPS reserve assumptions based on input from the Generation Inputs panel.

Loads

- Updated based on latest forecasts produced by Agency Load Forecasting.

Hydro Study Spill Updates

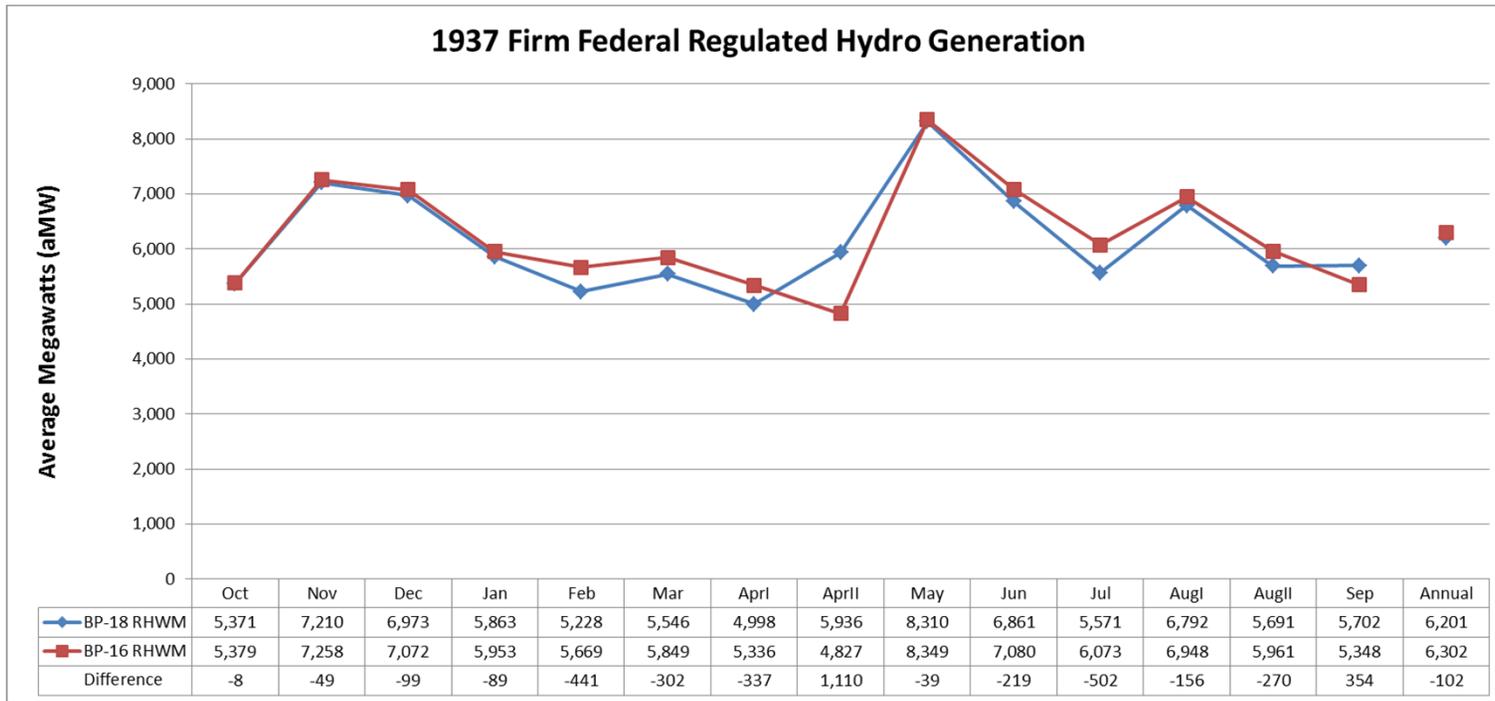
Early August Spill Curtailment

- Updated to reflect the most recent August dates provided by the Corps:
 - Lower Granite: August 13th
 - Little Goose: August 19th
 - Lower Monumental: August 21st
 - Ice Harbor: August 22nd
- These dates are one to four days later than the dates in the last rate case (i.e. they extend the spill period).

Spring Maximum Transport in Dry Years

- Removed this no-spill assumption, which increases spill in 1937 and seven other water years.

Firm Hydro Comparison to BP-16 RHW



- The loss of just over 100 aMW of firm energy is primarily caused by less outflow from Canadian projects in 1937, more Grand Coulee pumping, and the removal of the maximum transport no-spill assumption. Further, due to the changes in inflow, Grand Coulee drafts deeper November through February, resulting in head losses.

Federal Tier 1 System Firm Critical Output Summary

Federal Tier 1 System Firm Critical Output Projection - 2-Year Average
 RHW process for BP-18 Rate Period
 Study: S131-RC-20160411-154701

1.	T1SFCO Projections Energy in aMW	2018	2019	Average
2.	Total Federal System Hydro Generation (TRM Table 3.1)	6,603.9	6,598.9	6,601.4
3.	Total Designated Non-Federally Owned Resources (TRM Table 3.2)	1,148.8	986.0	1,067.4
4.	Total Designated BPA Contract Purchases (TRM Table 3.3)	137.0	137.7	137.4
5.	Total Designated System Obligations (TRM Table 3.4)	-919.1	-908.3	-913.7
6.	Federal Tier 1 System Firm Critical Output	6,970.6	6,814.4	6,892.5

T1SFCO Difference Preliminary RHWM for BP-18 Rate Period and BP-16 Final RHWM

T1SFCO 2-Year Average Comparison (Energy in aMW)	RHWM Process BP-18 Rate Period (FY 2018-19)	BP-16 Final RHWM Process (FY 2016-17)	Difference 2-Year Average	Comment
<i>T1SFCO Resource Differences</i>				
1. Total Federal System Hydro Generation (TRM Table 3.1)	6,601	6,702	-101	Hydro Resource Changes: Reduced Regulated Hydro generation due to: <ul style="list-style-type: none"> • Lower outflows from Canadian projects (-38 aMW), increased Grand Coulee pumping (-8 aMW), and the removal of the maximum transport no-spill assumption of the second year of study (-38 aMW) • Lower Canadian outflows reduced inflow into Grand Coulee causing deeper drafts in November through February resulting in head losses and lower generation (-10 aMW) • Miscellaneous updates (-7 aMW)
2. Total Designated Non-Federally Owned Resources (TRM Table 3.2)	1,067	1,050	18	Other Non-Federally Owned Resource Changes/Expirations: <ul style="list-style-type: none"> • Incorporating CGS generation improvements (+23 aMW) • GP-Paper (Wauna) acquisition expired 3/31/2016 (-5 aMW)
3. Total Designated BPA Contract Purchases (TRM Table 3.3)	137	177	-40	Contract Purchase Changes/Expirations: <ul style="list-style-type: none"> • BPA/RVSD contract expired 4/30/2016 (-8 aMW) • Incorporating financially settled LCA which was signed 9/27/2013 and no power is received by BPA (-32 aMW)
<i>T1SFCO Load System Obligation Differences</i>				
4. Total Designated System Obligations (TRM Table 3.4)	-914	-1,005	91	Contract Obligation Changes/Expirations: <ul style="list-style-type: none"> • BPA/USBR Obligation (+4 aMW) • CER to Canada (-4 aMW) • BPA/AVWP WNP3 Settlement update (+3 aMW) Contract Expirations/Changes: <ul style="list-style-type: none"> • BPA/PSE WNP3 Settlement expires 6/30/2017 (-42 aMW) • BPA/RVSD expired 4/30/2016 (-1 aMW) • BPA/BHEC expires 6/30/2017 (-8 aMW) • Incorporating financially settled LCA which was signed 9/27/2013, and no power is delivered to BCHA (-32 aMW) • Transmission loss change (-11 aMW)
5. Federal T1SFCO Output <small>(sum lines 1 through 4)</small>	6,892	6,924	-31	

Known T1SFCO Risks

- BPA and City of Idaho Falls (Idaho Falls) are currently negotiating the purchase of the output of Idaho Falls' Bulb Turbines (approximately 14 aMW)
 - If BPA does not purchase the output, this would reduce Idaho Falls' load on BPA, and lower the T1SFCO by an additional 14 aMW. In addition, this also would lower other customers' access to Tier 1 service, and increase Tier 2 or non-Federal resource amounts due to higher Above-RHWM loads.
 - The total reduction in the T1SFCO would change from 31 aMW to 45 aMW lower than BP-16.
 - The outcome of negotiations will not be known until early June, 2016.

RHWM Augmentation and Rate Effects



RHWM Augmentation

BESID	Preference Customer	CHWM 2016	Portion of CHWM which was additional through BP-16	TRL 2019	Additional CHWM 2018	Total Additional	2018 CHWM
10426	U.S. DOE Richland Operations Office	26.683	6.395	44.633	17.950	24.345	44.633
10482	Umpqua Indian Utility Cooperative	4.175	1.375	2.711	0.000	1.375	4.175
10502	Yakama Power	11.807	5.490	9.762	0.000	5.490	11.807
12026	Jefferson County PUD #1	45.847				45.847	45.847

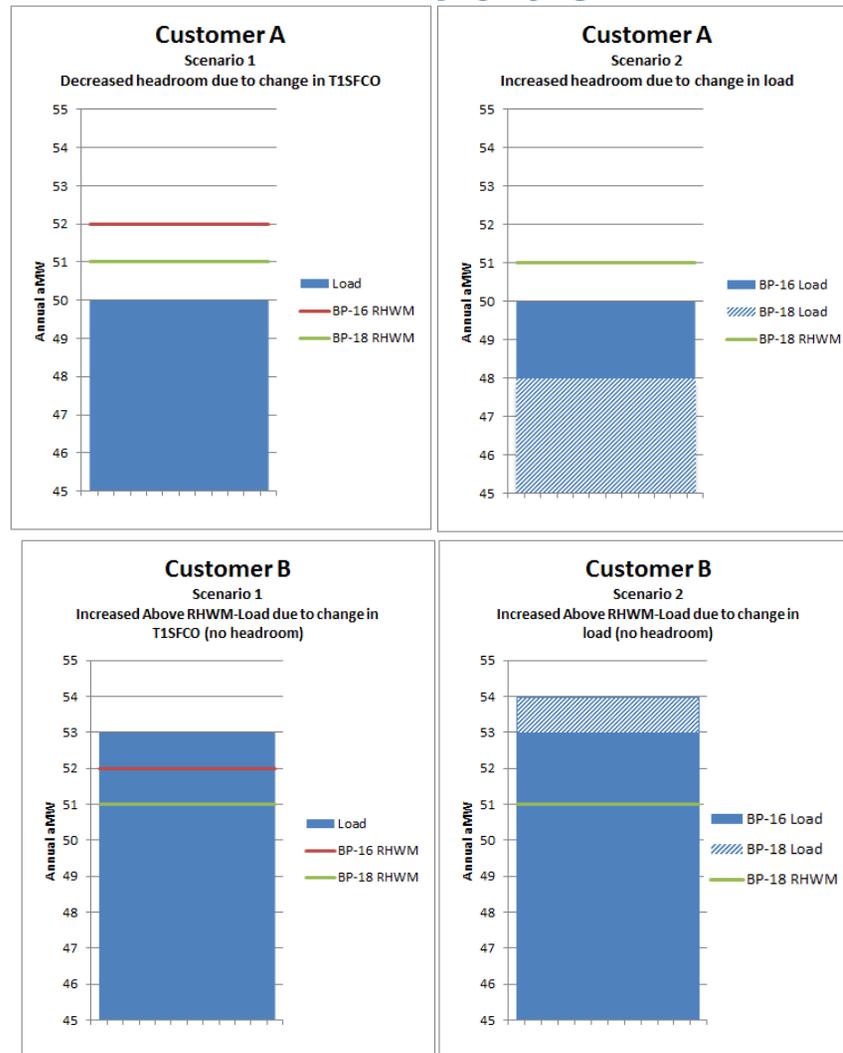
T1SFCO	6892.489
RHWM Augmentation	77.057
RT1SC	6969.546

Rate Effects Resulting from Load Changes

- Changes to the both Customer Loads and the Tier 1 System result in changes to Tier 1 Loads
 - If a customer's load is at or *below* the 2016 RHWM value, then a decrease in the BP-18 Tier 1 System does not necessarily decrease the customer's Tier 1 load. But a decrease in that customer's load will result in an increase in "headroom" and therefore a decrease in overall Tier 1 Loads.
 - If a customer's load is at or *above* the 2016 RHWM value, then a decrease in the system will result in a decrease in that customer's Tier 1 load, and therefore a decrease in overall Tier 1 Loads.

- The Tier 1 rate increases by about 0.5%, half of the increase is due to lower Tier 1 loads and half the increase is due to the lower Tier 1 System.
 - Because the Tier 1 Average Net Cost of Power is \$/MWs, changes to Tier 1 loads MWs effect the rate increase Tier 1 Loads decreased about 35 aMW, which is estimated to increase the Tier 1 Rate by about 0.5%.
 - Headroom increased by 15 aMW, so only about 20aMW of the load effect is a result of the decrease in the Tier 1 System; therefore the rate effect attributable to the T1SFCO decrease is about 0.25%

RHWM and Forecast Load Effects on Tier 1 Loads



Next Steps

- Public comment period May 11 - 25, 2016. Please submit comments (including load forecast change requests) on BPA's public comment page:
<https://www.bpa.gov/applications/publiccomments/OpenCommentListing.aspx>
- RHWM preliminary outputs are posted on the RHWM website:
<https://www.bpa.gov/Finance/RateCases/BP-18/Pages/Rate-Period-High-Water-Mark-Process.aspx>
- June 30, 2016 public workshop tentatively scheduled to address customer concerns raised in the public comment period.
- August 9, 2016 public workshop to present draft final RHWM outputs

Questions?

Appendix

RHWM Timeline

Action	FY16 Timing
<i>PRELIMINARY PROCESS BEGINS</i>	
Public workshop - Present preliminary RHWM process outputs (T1SFCO, RHWM, and Above-RHWM Loads)	May 10 (Tuesday)
Public comment period will run for two weeks following the public workshop (on BPA comment page)	May 11 (Wednesday) - May 25 (Wednesday)
Second public workshop before official process begins (if necessary)	June 30 (Thursday)
Calculate draft final RHWM process outputs	July
<i>FORMAL PROCESS BEGINS</i>	
Public workshop - Present draft final RHWM process outputs (T1SFCO, RHWM, and Above-RHWM Loads)	August 9 (Tuesday)
Draft final RHWM process outputs published	August 9 (Tuesday)
Public comment period will be run for 10 business days following the public workshop (on BPA comment page)	August 10 (Wednesday)-August 23 (Tuesday)
Deadline for written preservation of right to dispute	August 12 (Friday)
Republish RHWM process outputs (if changes made due to public comments)	September 6 (Tuesday)
Deadline for dispute notice	September 16 (Friday)
Publish final RHWM process outputs	September 30 (Friday)

Final RHWM outputs will be published on September 30th assuming there is no dispute

Federal System Hydro Generation Used in T1SFCO Calculation

Federal System Hydro Generation for use in the T1SFCO Calculation

RHWM Process for BP-18 Rate Period

TRM Table 3.1

Study: S131-RC-20160411-154701

1.	Regulated Hydro	2018	2019	Average
2.	Albeni Falls	22.4	21.9	22.1
3.	Bonneville	390.7	390.7	390.7
4.	Chief Joseph	1,100.1	1,100.2	1,100.1
5.	Dworshak	141.6	137.0	139.3
6.	Grand Coulee	1,907.1	1,907.1	1,907.1
7.	Hungry Horse	81.4	81.4	81.4
8.	Ice Harbor	109.1	109.1	109.1
9.	John Day	784.7	784.7	784.7
10.	Libby	186.8	186.8	186.8
11.	Little Goose	156.4	156.4	156.4
12.	Lower Granite	146.4	146.4	146.4
13.	Lower Monumental	146.4	146.4	146.4
14.	McNary	478.2	478.2	478.2
15.	The Dalles	599.3	599.3	599.3

Federal System Hydro Generation Used in T1SFCO Calculation *(continued)*

Federal System Hydro Generation for use in the T1SFCO Calculation
RHW process for BP-18 Rate Period
TRM Table 3.1
Study: S131-RC-20160411-154701

16.	Independent Hydro	2018	2019	Average
17.	Anderson Ranch	12.2	12.2	12.2
18.	Big Cliff	9.7	9.7	9.7
19.	Black Canyon	6.2	6.2	6.2
20.	Boise River Diversion	1.2	1.2	1.2
21.	Chandler	6.1	6.1	6.1
22.	Cougar	19.0	19.0	19.0
23.	Cowlitz Falls	26.5	26.5	26.5
24.	Detroit	33.8	33.8	33.8
25.	Dexter	9.4	9.4	9.4
26.	Foster	12.2	12.2	12.2
27.	Green Peter	26.9	26.9	26.9
28.	Green Springs - USBR	7.3	7.3	7.3
29.	Hills Creek	18.0	18.0	18.0
30.	Idaho Falls - City Plant	4.2	4.2	4.2
31.	Idaho Falls - Lower Plants #1 & #2	5.8	5.8	5.8
32.	Idaho Falls - Upper Plant	4.2	4.2	4.2
33.	Lookout Point	35.8	35.8	35.8
34.	Lost Creek	30.1	30.1	30.1
35.	Minidoka	10.7	10.7	10.7
36.	Palisades	67.4	67.4	67.4
37.	Roza	6.9	6.9	6.9
38.	Total Tier 1 Federal System Hydro Generation	8,621.9	8,617.9	8,619.9

Designated Non-Federally Owned Resources Used in T1SFCO Calculation

Designated Non-Federally Owned Resources for use in the T1SFCO Calculation
 RHWM Process for BP-18 Rate Period
 TRM Table 3.2
 Study: S131-RC-20160411-154701

1.	Project	2018	2019	Average
2.	Ashland Solar Project	0.0	0.0	0.0
3.	Columbia Generating Station	1,100.0	937.3	1,018.6
4.	Condon Wind Project	11.7	11.7	11.7
5.	Dworshak/Clearwater Small Hydropower	2.6	2.6	2.6
6.	Footo Creek 1	3.6	3.6	3.6
7.	Footo Creek 2	0.0	0.0	0.0
8.	Footo Creek 4	4.0	4.0	4.0
9.	Fourmile Hill Geothermal <i>(Not included)</i>	0.0	0.0	0.0
10.	Georgia-Pacific Paper (Wauna) <i>(Acquisition Expired 4/5/2016)</i>	0.0	0.0	0.0
11.	Klondike I	5.7	5.7	5.7
12.	Stateline Wind Project	21.2	21.2	21.2
13.	White Bluffs Solar	0.0	0.0	0.0
14.	Total Designated Non-Federally Owned Resources	1,148.8	986.0	1,067.4

Designated BPA Contract Purchases Used in T1SFCO Calculation

Designated BPA Contract Purchases for use in the T1SFCO Calculation
Preliminary RHWM Process for BP-18 Rate Period
TRM Table 3.3
Study: S131-RC-20160411-154701

1.	Contract Purchases	Contract #	2018	2019	Average
2.	Priest Rapids CER for Canada	97PB-10099	29.2	28.9	29.0
3.	Rock Island #1 CER for Canada	97PB-10102	17.7	18.3	18.0
4.	Rock Reach CER for Canada	97PB-10103	37.1	37.6	37.3
5.	Wanapum CER for Canada	97PB-10100	28.2	28.5	28.3
6.	Wells CER for Canada	97PB-10101	23.9	23.6	23.7
7.	BCHP to BPA PwrS	99PB-22685	1.0	1.0	1.0
8.	BCHP to BPA LCA (<i>settled financially</i>)	99PB-22685	0.0	0.0	0.0
9.	PASA to BPA Pk Repl (<i>expired 4/30/2015</i>)	94BP-93658	0.0	0.0	0.0
10.	PASA to BPA S/N/X (<i>expired 4/30/2015</i>)	94BP-93658	0.0	0.0	0.0
11.	PASA to BPA Xchg Nrg (<i>expired 4/30/2015</i>)	94BP-93658	0.0	0.0	0.0
12.	RVSD to BPA Pk Repl (<i>expired 4/30/2016</i>)	94BP-93958	0.0	0.0	0.0
13.	RVSD to BPA Seas Xchg (<i>expired 4/30/2016</i>)	94BP-93958	0.0	0.0	0.0
14.	RVSD to BPA Xchg Nrg (<i>expired 4/30/2016</i>)	94BP-93958	0.0	0.0	0.0
15.	PPL to BPA SNX (Spring Return) (<i>expired 6/1/2014</i>)	94BP-94332	0.0	0.0	0.0
16.	PPL to BPA SPX (Summer Return) (<i>expired 6/1/2014</i>)	94BP-94332	0.0	0.0	0.0
17.	Total Designated BPA Contract Purchases		137.0	137.7	137.4

Designated BPA System Obligations Used in T1SFCO Calculation

Designated BPA System Obligations for use in the T1SFCO Calculation
Preliminary RHW Process for BP-18 Rate Period

TRM Table 3.4

Study: S131-RC-20160411-154701

1.	System Obligation	Contract #	2018	2019	Average
2.	BPA to BRCJ Chief Joseph	14-03-17506; 14-03-49151	8.8	8.8	8.8
3.	BPA to BRCB Columbia Basin Project	lbp-4512; 14-03-001-12160	142.9	142.9	142.9
4.	BPA to BRCR Crooked River Project	14-03-73152	0.7	0.7	0.7
5.	BPA to BRBP Owyhee Project	EW-78-Y-83-00019	1.7	1.7	1.7
6.	BPA to BRRP Rathdrum Prairie Project	14-03-49151	0.7	0.7	0.7
7.	BPA to BRSID Southern Idaho Projects	EW-78-Y-83-00019	20.0	20.0	20.0
8.	BPA to BRSIN Spokane Indian Develop.	14-03-49151	0.3	0.3	0.3
9.	BPA to BRSV Spokane Valley	14-03-63656	0.7	0.7	0.7
10.	BPA to BRTD The Dallas Reclamation Project	14-03-32210	2.0	2.0	2.0
11.	BPA to BRTV Tualatin Project	14-03-49151	0.8	0.8	0.8
12.	BPA to BRUB Umatilla Basin Project	10GS-75345	2.4	2.4	2.4
13.	BPA to BRYK Yakima Project	DE-MS79-88BP92591	1.8	1.8	1.8
14.	BPA to BCHP LCA (<i>settled financially</i>)	99PB-22685	0.0	0.0	0.0
15.	BPA to BCHA Can Ent	99EO-40003	468.5	462.4	465.5
16.	BPA to BCHA NTSA	12PG-10002	9.1	9.1	9.1

Designated BPA System Obligations Used in T1SFCO Calculation *(Continued)*

Designated BPA System Obligations for use in the T1SFCO Calculation
Preliminary RHW Process for BP-18 Rate Period
TRM Table 3.4
Study: S131-RC-20160411-154701

1.	System Obligation	Contract #	2018	2019	Average
17.	BPA to BHEC 2012PSC <i>(expired 6/30/2017)</i>	97PB-10051	0.0	0.0	0.0
18.	BPA to PASA C/N/X <i>(expired 4/30/2015)</i>	94BP-93658	0.0	0.0	0.0
19.	BPA to PASA S/N/X <i>(expired 4/30/2015)</i>	94BP-93658	0.0	0.0	0.0
20.	BPA to RVSD C/N/X <i>(expired 4/30/2016)</i>	94BP-93958	0.0	0.0	0.0
21.	BPA to RVSD Seas Xchg <i>(expired 4/30/2016)</i>	94BP-93958	0.0	0.0	0.0
22.	Federal Intertie Losses <i>(Calculated: 3.0% of Intertie Sales Table 2.12.5 lines 18-21)</i>	n/a	0.0	0.0	0.0
23.	BPA to AVWP WP3 S <i>(expires 6/30/2019)</i>	85BP-92186	44.8	44.8	44.8
24.	BPA to PPL SNX (Spring Delivery) <i>(expired 6/1/2014)</i>	94BP-94332	0.0	0.0	0.0
25.	BPA to PPL SPX (Summer Delivery) <i>(expired 6/1/2014)</i>	94BP-94332	0.0	0.0	0.0
26.	BPA to PSE WP3 S <i>(expired 6/30/2017)</i>	85BP-92185	0.0	0.0	0.0
27.	BPA to PSE Upper Baker 2	09PB-12126	1.3	1.3	1.3
28.	BPAP to BPAT <i>(Dittmer/Substation Service)</i>	09PB-12128	9.4	9.4	9.4
29.	Federal Power Trans. Losses	n/a	238.3	232.7	235.5
30.	Slice Transmission Loss Returns	n/a	-35.1	-34.3	-34.7
31.	Total Designated System Obligations		919.1	908.3	913.7