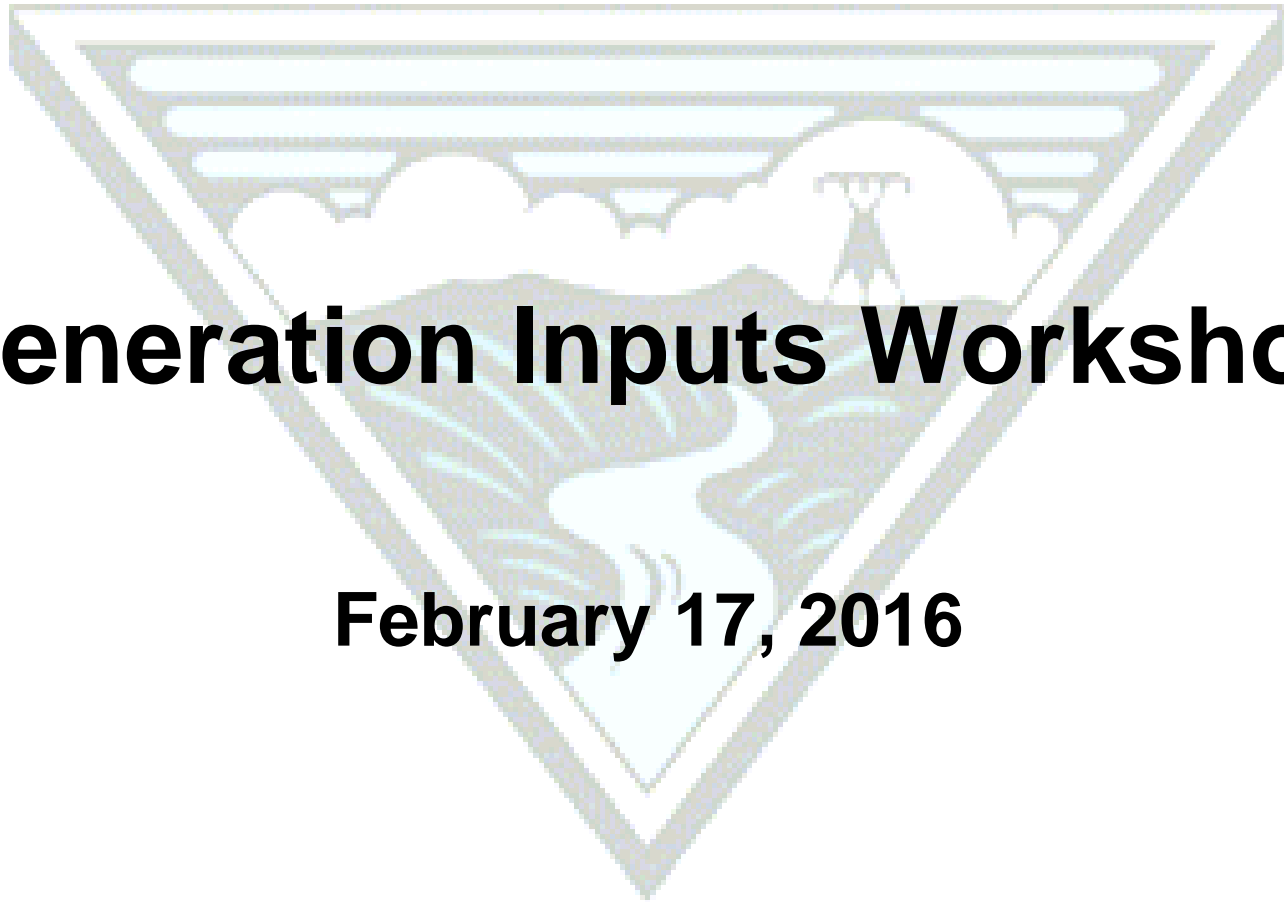


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Generation Inputs Workshop

February 17, 2016



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**Including BAL-001-2 in
Calculations of Balancing
Reserve Capacity Quantity
Forecast**

Libby Kirby

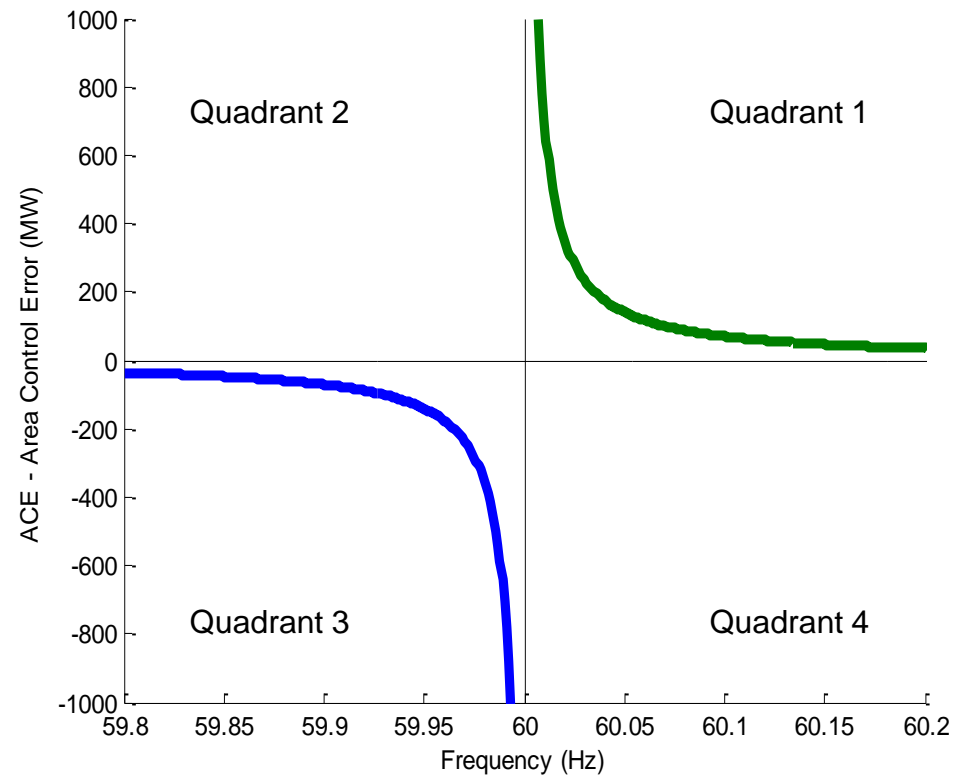
What is BAL-001-2?

- A new control performance standard, aiming to maintain appropriate interconnection frequency by dictating an acceptable Area Control Error (ACE) to which we control
 - Replaces CPS2 standard
- “Each Balancing Authority shall operate such that its clock-minute average of Reporting ACE does not exceed its clock-minute Balancing Authority ACE Limit (BAAL) for more than 30 consecutive clock-minutes”



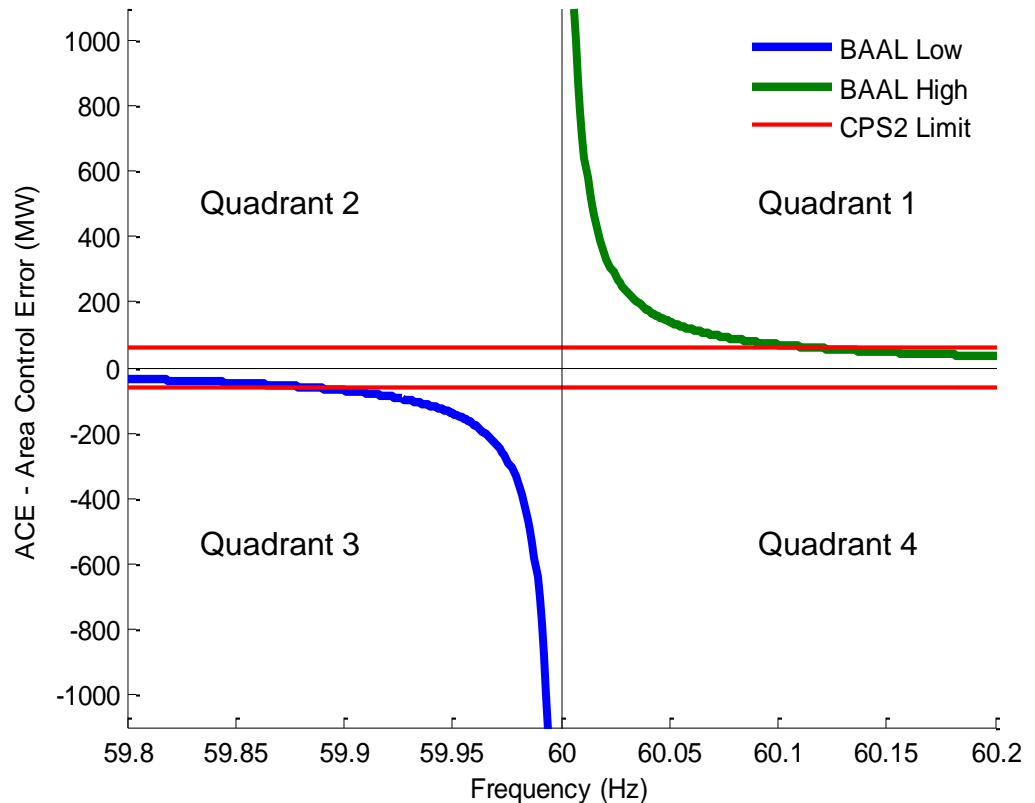
BAL-001-2 Structure

- A limit is placed on ACE when it is negatively impacting frequency (quadrants 1 & 3).
- No limit placed on ACE when it is positively impacting frequency (quadrants 2 & 4).



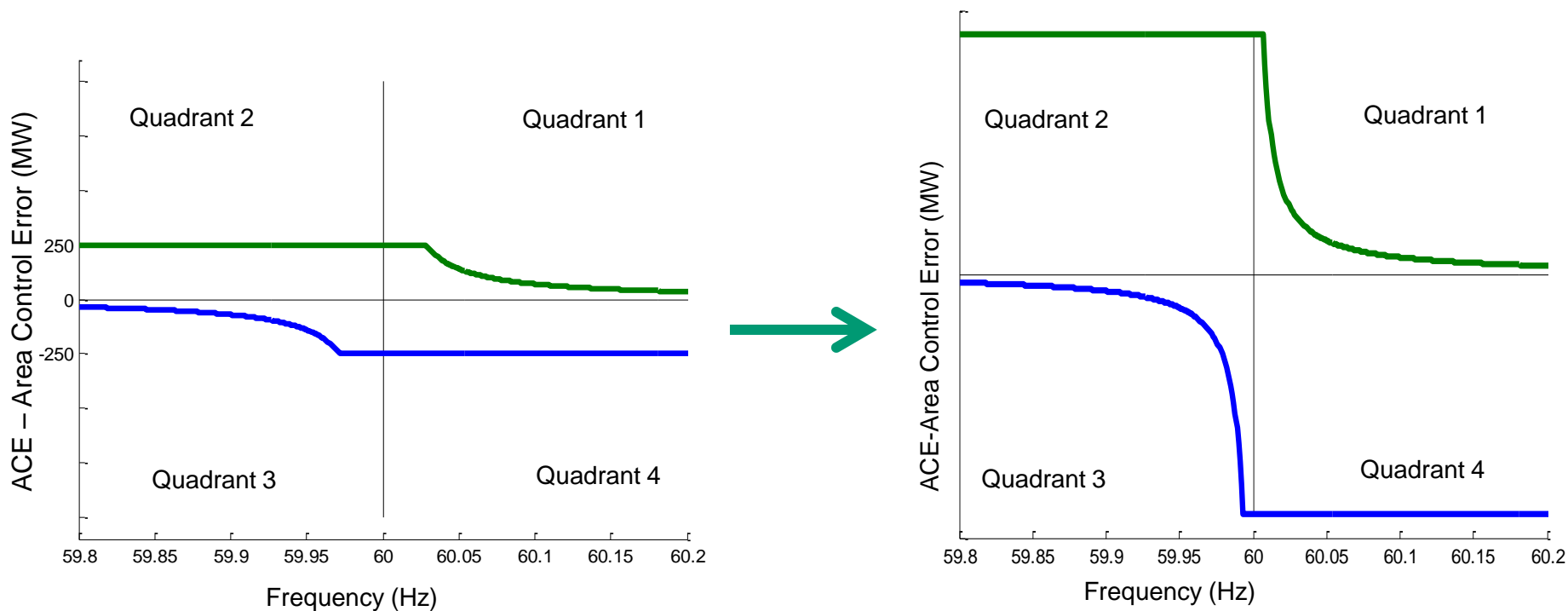
BAL-001-2 Structure vs CPS2

- CPS2 maintains a small, static limit, regardless of system conditions.
- BAL-001-2 introduces a more lenient limit when frequency is not significantly deviating.



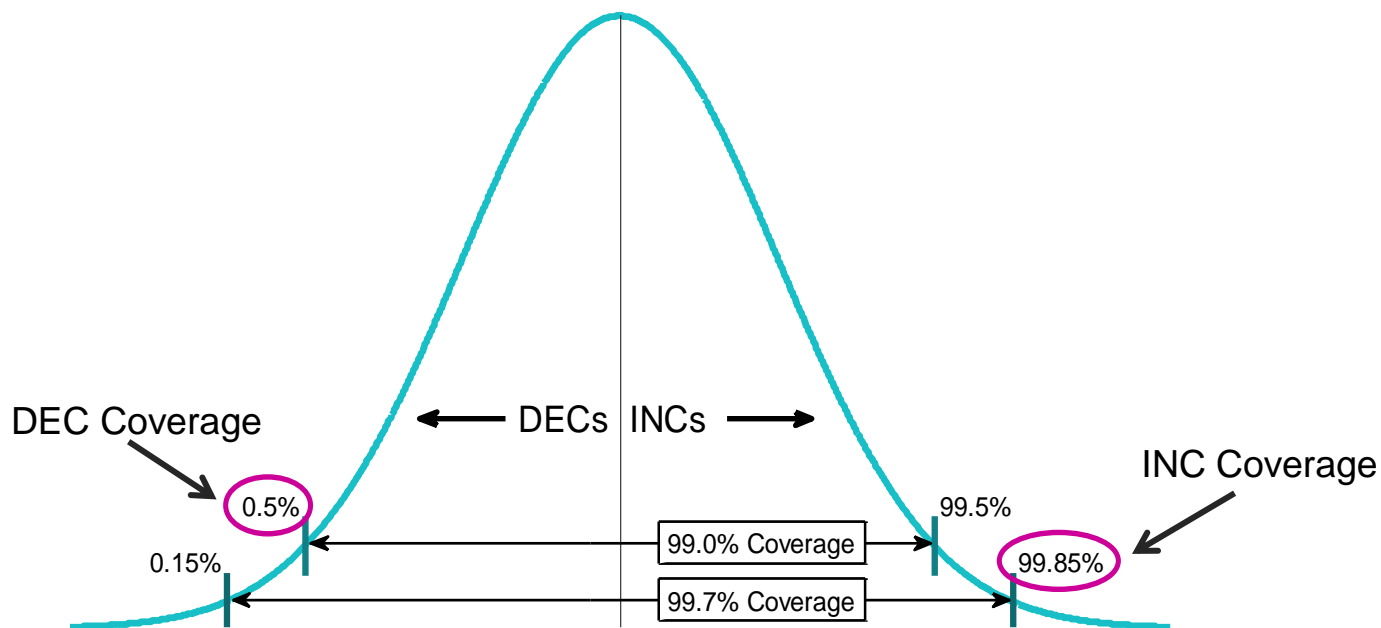
Current BPA BAAL Implementation

- When BPA implemented this standard for the trial, limits of approximately 250 MW in quadrants 2 and 4 were included per WECC, in order to maintain ACE to a level with which WECC was comfortable. This limit is known as the *ACE Transmission Limit*, or ATL. This limit will likely be raised upon the move from field trial to official standard.



Current Balancing Reserves Held

- BPA currently holds balancing reserves in order to return ACE to 0 at any time. INC reserves have been calculated to a 99.7% confidence interval. BP-16 settlement values are approximately the circled values below.



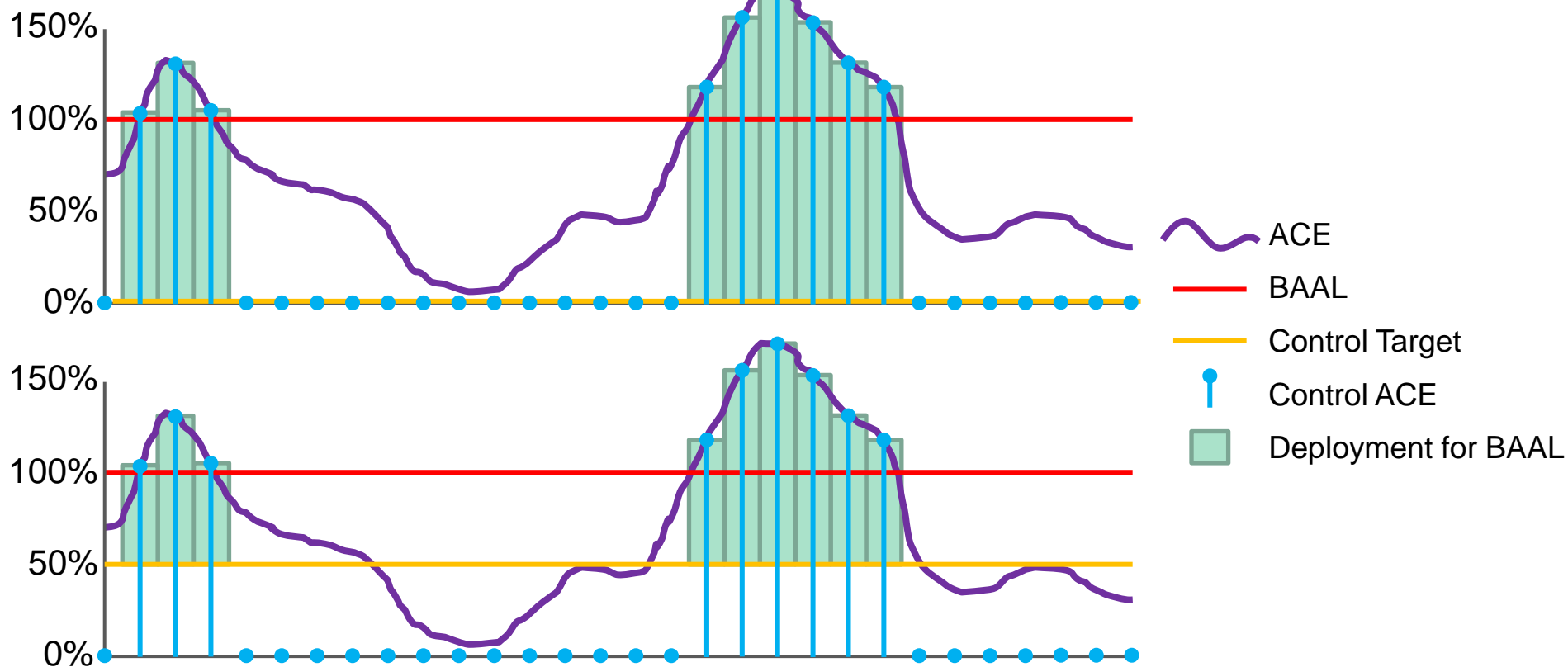
Incorporation of BAL-001-2 into Calculations

- BAL-001-2 has the potential to reduce the Balancing Reserve Capacity Quantity Forecast while maintaining the level of reliability, due to the more lenient limit imposed. Rather than deploying an amount of reserves necessary to drive ACE back to 0, we need to deploy enough reserves to correct ACE reliably inside the BAAL. We need not deploy any reserves unless we exceed the limit.



Control Mechanism Example Concerning Control Target

- Control to 0% of BAAL vs. Control to 50% of BAAL:



Possible Impact on Balancing Reserve Capacity

	Possible Scenarios	
Control ACE to...of BAAL	0%	50%
Balancing Capacity Reduction Estimate	0% - 5%	8% - 15%

Note: Current generation fleet reflected in calculation

These values do not yet represent CPS1 control, which may increase the balancing reserve capacity

ESTIMATES ONLY



Caveats

- RC may request a BA to return ACE to 0 at any time
 - To take advantage of the BAAL savings in the reserves, we may need to use OCBR in this case
- These values/scenarios do not yet represent CPS1 control, which may increase the capacity necessary for Balancing Reserves
- Current generation fleet reflected in reduction calculations
 - Iberdrola, Portland General Electric, and Puget Sound Energy wind all still included



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Preliminary Installed Resources Forecast

Cherilyn Randall

Preliminary BPA Installed Resource Forecast

- Preliminary Forecast as of February 2016 for BP-18 Rate Period
 - Wind
 - Solar
 - Non-Federal Thermal
- Assumptions
 - Assume Production Tax Credit renewed for FY 2018-2019
 - Economy is showing growth in certain areas
 - Slower wind growth
 - Increased interest in solar
 - Will update forecast for the BP-18 Initial Proposal



Preliminary BPA Installed Resource Forecast

- Considerations for the Preliminary Forecast
 - A review of the pending requests in BPA’s generator interconnection queue
 - Information provided for the requests under BPA’s Large Generator Interconnection Procedures (LGIP)
 - LGIP study process
 - Status of environmental review process and interconnection customer permitting process
 - Information from customer about its plans such as project scheduling, financing, Federal and state incentives, turbine/panel ordering commitment
 - Construction of network additions and interconnection facilities required to interconnect
 - Customer execution of an engineering and procurement agreement
 - Execution of interconnection agreement and commitment by customer to fund all BPA facilities necessary for the interconnection



Preliminary BPA Installed Resource Forecast

- Current installed resources and forecast for the rest of the BP-16 rate period

Installed Resource Forecast (MW)			
	<i>Wind</i>	<i>Solar</i>	<i>Non-Federal Thermal</i>
2/1/2016	4783	6	3931
10/1/2017	4783	24	3974



Preliminary BPA Installed Resource Forecast

- Forecast additions of installed resources for BP-18
 - Addition of one 200 MW wind project in summer of 2018
 - Addition of one 5 MW solar project in fall of 2018
 - Addition of one 43 MW non-Federal thermal project



Preliminary BPA Installed Resource Forecast

- Solar forecast for BP-18
 - Currently at 6 MW of installed solar from two projects
 - Forecast 17 MW of installed solar from three projects by the end of FY 2017
 - Forecast 5 MW of solar from one project in the BP-18 rate period
 - Expect more solar development after the BP-18 rate period



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**Mock Election of VERBS and
DERBS Service for BP-18**

Eric King

Mock Election for VERBS and DERBS Service

- Non-Binding election of Variable Energy Resource Balancing Service (VERBS) Service for BP-18.
- Non-Binding election of Dispatchable Energy Resource Balancing Service (DERBS) Service for BP-18.
- Mock election forms located at:
www.bpa.gov/Finance/RateCases/BP-18/Pages/default.aspx
- Submit completed election forms to techforum@bpa.gov by close of business on March 15, 2016.



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Next Steps

Daniel Fisher and Chris Gilbert

Next Steps on Workshops

- Generation Inputs Workshops
 - Planning one workshop per month for January through August 2016
 - Announcements will be sent through Tech Forum
 - 29 March 2016
 - 20 or 21 April 2016
 - 24 May 2016
 - 29 or 30 June 2016



Next Steps on Solar Generation Heat Maps

- Working with the BPA GIS group to develop and host a solar generation siting map for external use.
 - Criteria
 - Irradiance
 - Transmission Lines (115/69 kv)
 - Load Centers/ Flow Gate Constraints
 - Communication
 - Criteria would be weighted to identify optimal locations for siting solar generation.

