2012 BPA Rate Case Customer Workshop

Generation Inputs/Wind Balancing Service

August 19, 2010

Agenda

About Today's Discussion

- We want to share our current thinking about Intra-Hour Financial Settlement, Redispatch, Balancing Plan Election, Thermal Generator Treatment Alternatives, Mid-Rate Period Adjustment of the Wind Balancing Service Rate, Rate Design Billing Determinant Concepts, and Persistent Deviation Alternatives. We also have an update from the Wind Integration Team on the Intra-Hour Scheduling Pilot Program.

- The issues discussed today do not reflect BPA commitment to adopt any particular proposal or position. The materials are very much a work in progress.

- Today's discussion is preliminary and pre-decisional.

- We look forward to working together to better understand the issues that will help shape the development of the Initial Proposal.

Parking Lot Issues

Parking Lot Issues

	WIND/GENERATION INPUTS PARKING LOT TOPICS	
1	Persistent Deviation Penalty ▪ Relative to DSO 216	Covered in 12 May and 27 May 2010 workshops
2	DSO 216 – Experience to date	Covered in 12 May 2010 workshop
3	Generation Imbalance relationship to within-hour balancing	Covered in 12 May 2010 workshop
4	Incentive for scheduling accuracy	To be scheduled for August in Rate Design
5	Use of 120-hour peaking capacity for costing methodology vs. use of instantaneous capacity for reserve requirement calculation	Covered in 14 April 2010 workshop
6	Review of BPA's five services/protocols related to wind integration for duplication and consistency, esp. with regard to Persistent Deviation Penalty	Covered in 12 May 2010 workshop
7	Explore whether, and to what extent, BPA can set aside wind reserves on an incremental and flexible basis over the rate period (to enable incentive-based rate design)	To be scheduled for August in Rate Design
8	Tiered wind integration rate structure based on whether customers are committed to scheduling on a ½ hour basis	To be scheduled for August in Rate Design
9	Modify BPA's intra-hour scheduling policy to allow for incremental changes in wind schedules as well as the decremental changes currently allowed	Refer topic to Wind Integration Team (WIT) Quarterly Review
10	Formula rate for wind	Covered in 15 July 2010 workshop
11	Charge imbalance portion of the wind integration rate on a basis that reflects schedule accuracy – i.e., proportionate to the schedule imbalances.	To be scheduled for August in Rate Design

Parking Lot Issues (continued)

	WIND/GENERATION INPUTS PARKING LOT TOPICS	
12	Scaling methodology – revisit	Covered in 14 April 2010 and 17 June 2010 workshops
13	Timeline for decisions re. assumptions	See Workshop Schedule Each workshop
14	▪ Timing for: -Self-supply -Within-hour scheduling	See Workshop Schedule
15	Wind experience to date	Covered in 12 May 2010 workshop
16	Periodic presentations from the WIT to provide updates on WIT projects over the rate period	See Workshop Schedule
17	Marginal pricing for capacity sold as ancillary and control area services	To be scheduled for August in Cost Allocation/ Rate Design
18	Inclusion of Energy Shift costs in the variable cost component of Gen Input costs.	Covered in 12 May 2010 workshop
19	Take a pro-rata reduction in reserves from wind during a feathering/curtailment rather than taking the full amount.	Refer topic to Wind Integration Team (WIT)
20	If default on self-supply, what is the rate impact to them?	Covered in 12 May 2010 workshop
21	New Persistent Deviation design for the next rate case that meets the objective.	Covered in 27 May 2010 workshop To be scheduled in Rate Design
22	Look at different times of the year in setting up Persistent Deviation design	See Workshop Schedule
23	If a project leaves BPA during the rate period, can a failed self-supplier take over the reserve allocation?	To be scheduled for August in Rate Design
24	Redispatch: Review of current FY actual redispatch and inter-business-line payments	To be scheduled for August workshop

Generation Inputs Rate Case Workshop

BPA's Intra-Hour Scheduling Pilot Update

August 19, 2010

Overview of Intra-Hour Scheduling Pilot

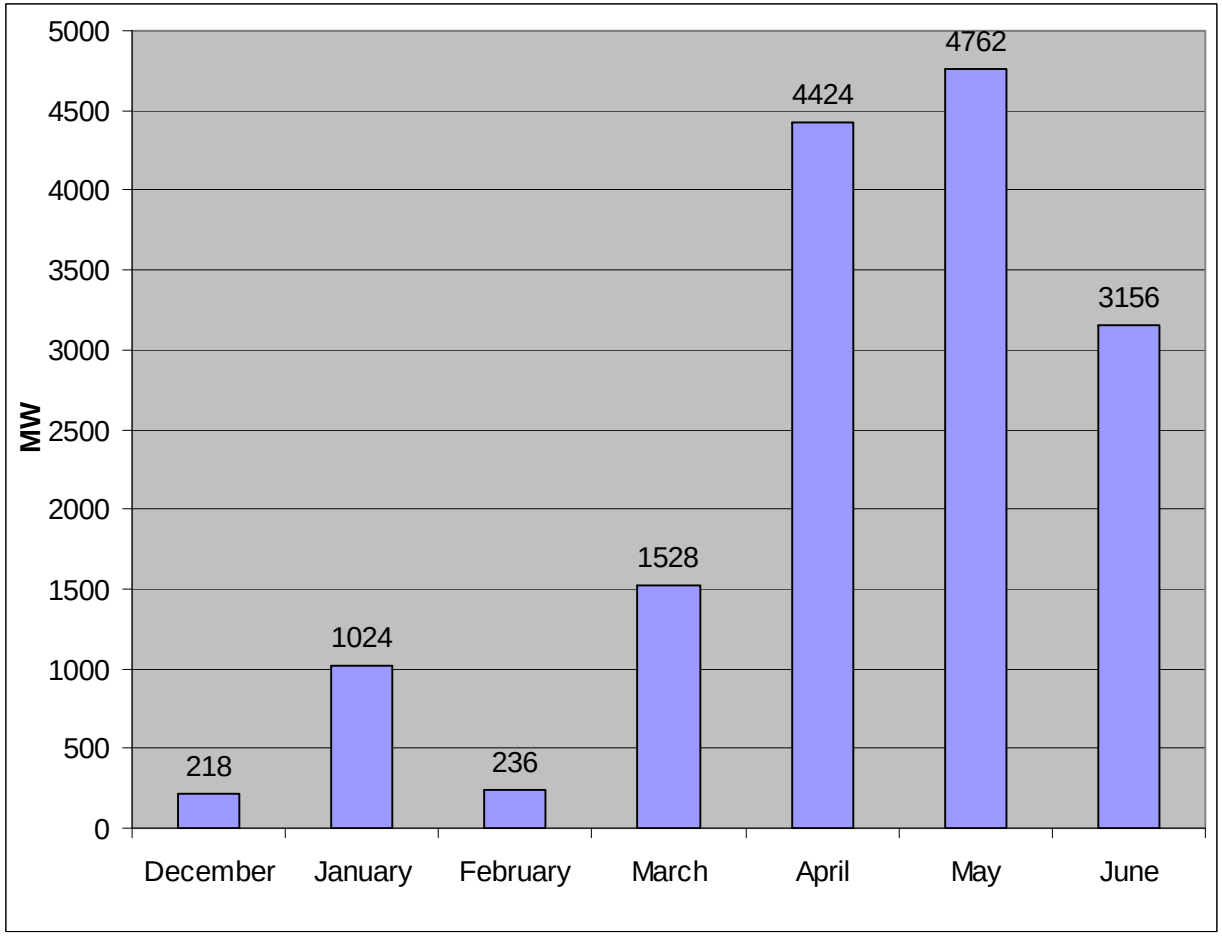
Intra-Hour Scheduling Pilot – Phase I

- Phase I of the pilot was implemented on December 1, 2009.
- The purpose of this pilot was to evaluate and verify wind generators' ability to implement and submit mid-hour schedule changes in response to over generation.
- During Phase I, BPA assessed the value of the pilot through an evaluation criteria of events and customer contacts to determine interest and value (both through e-mails and phone calls).
- Phase I has been extended for an undetermined length.

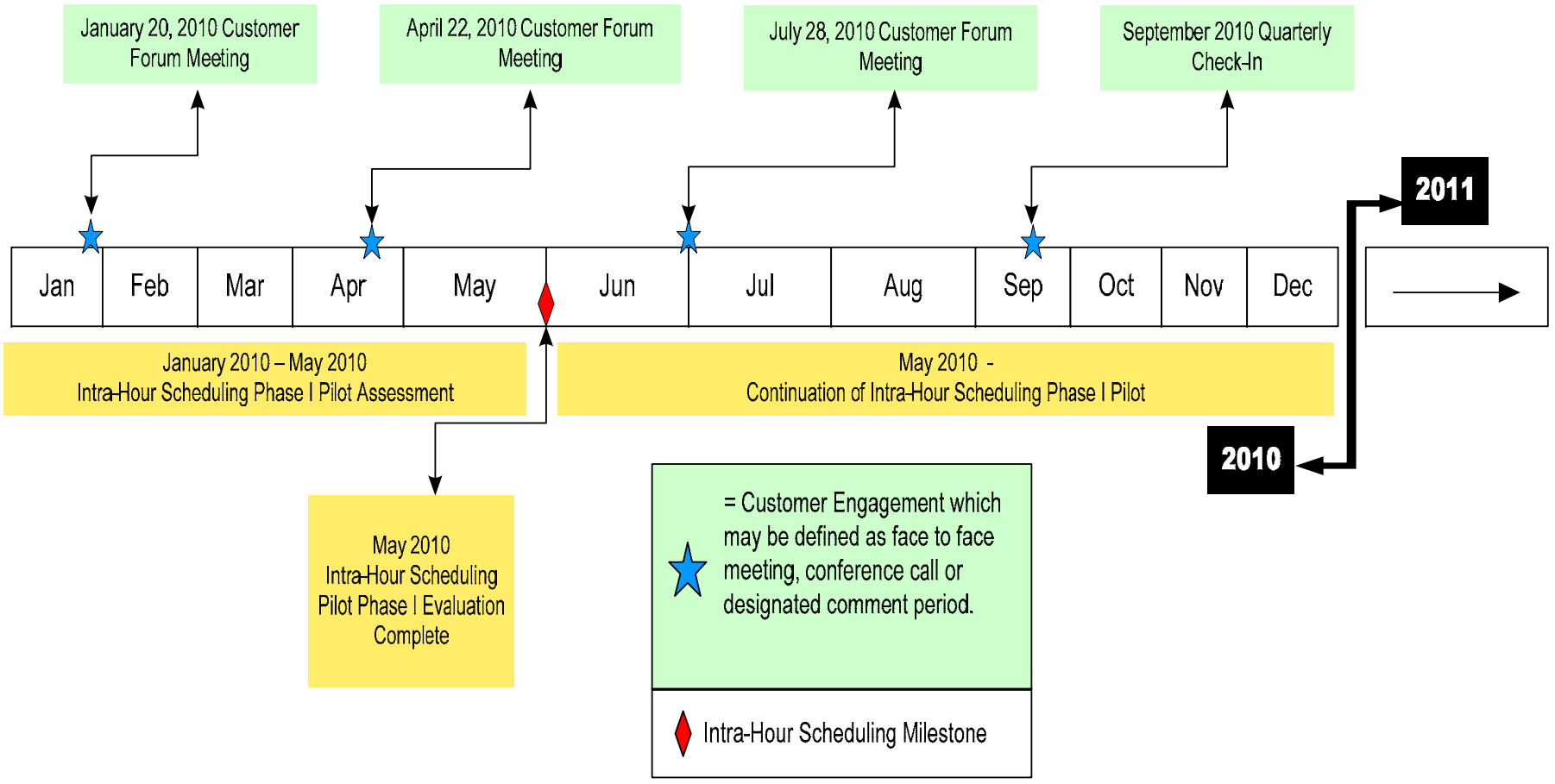
Criteria for Phase I of Intra-Hour Scheduling Pilot

- Submitting a new within-hour non-firm e-tag request
- Must be a wind resource
- Must be an export
- When generation for wind resources exceeds the existing schedules
- For service beginning on the half hour
- Must have a 10 minute ramp
- Billing the entire hour as Hourly Non-firm PTP Transmission Service

Intra-Hour Scheduling
Phase I Results



Intra-Hour Scheduling Pilot

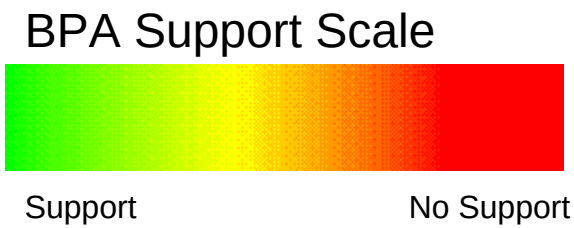


Intra-Hour Scheduling Current Associated Activities

- Outreach to the California ISO
- Joint Initiative Proposal
- OATI (Open Access Technology International, Inc.) wesTTrans Technical Committee: e-Tag Validations

Intra-Hour Scheduling
Joint Initiatives Activities

- Joint Initiative Proposed Phases
  - Step 1– Intra-Hour Schedule changes on the half hour
  - Step 2– Intra-Hour Schedule changes at :20 & :40
  - Step 3– Intra-Hour Schedule Changes on the 10's
  - Step 4– Intra-Hour Schedule Changes at any time



Questions and Answers

Intra-Hour Scheduling Financial Settlement

Intra-hour Generation Imbalance Overview

- Objective
  - Determine if we should modify BPA's Generation Imbalance (GI) policy to facilitate moving to an intra-hour (i.e., 30-minute or less) scheduling paradigm.
- Background
  - Purpose of GI is to assure:
    - Load-resource balance in the Balancing Authority Area and,
    - Promote and incent scheduling accuracy (reference: Generation Imbalance Business Practice, Version 2).
- Concern
  - Intra-hour schedules will be in effect during the FY 2012 rate period.
  - Current GI policies and calculations assume an hourly scheduling window.
  - Hourly GI calculations in an intra-hour scheduling window may incent biased intra-hour schedules that would have adverse impacts to hydro operations.

Proposed Intra-Hour GI Alternatives

Status Quo (hourly schedules)

Hourly GI = Avg [1HR. Actual Gen] – Avg [1HR. Scheduled Gen]

Alternatives (assuming 30-minute (½ hour) schedules)

I. Hourly Settlement:

Hourly GI = Avg [1HR. Actual Gen] – Avg [½HR.1 Scheduled Gen , ½HR.2 Scheduled Gen]

II. Intra-hour Settlement:

Intra-Hour GI = Avg [½HR. Actual Gen] – Avg [½HR. Scheduled Gen]

Considerations for Intra-Hour GI Settlement

Considerations

I. Operational Concerns
- Risk to Hydro Operations
  - Intra-hour volatility, ability to bias schedules to unwind GI
- Risk to Transmission Operations

II. Implementation
- Changes to Business Systems (historic systems built on hourly model)
  - Metering
  - Billing
  - Associated Processes (planning, scheduling, forecasting)
- Scheduling Window
  - Adoption of Phase 2 (30-minute, bi-directional, generation and load schedules)
  - 30- vs. 20- vs. 15-minute scheduling windows

III. Market and Regional Support
- Intra-Hour Market Depth
- Adoption of Intra-Hour Schedules by Adjacent Balancing Areas

Redispatch

Types of Redispatch

- Our objective today is to review the actual redispatch costs and forecasted redispatch costs under Attachment M and other programs.
- Under the Open Access Transmission Tariff (OATT), Attachment M, Transmission Services initiates redispatch of federal resources as part of its congestion management efforts.
- Pursuant to Attachment M, the following are the different types of redispatch:
  - Discretionary Redispatch – as requested by Transmission Services to avoid or ameliorate curtailments
  - NT Firm Redispatch – as requested by Transmission Services after curtailing non-firm point-to-point and secondary network schedules
  - Emergency Redispatch – as requested by Transmission Services upon its declaration of a system emergency consistent with NERC policy.
- Attachment M also allows Power Services to provide redispatch through purchases of transmission services or purchases and/or sales of energy. Power Services secures transmission services for planned and unplanned outages.

Redispatch and Related Costs

- In the 2010-11 Transmission Rate Case, Transmission Services forecast a total of $600,000 for costs of redispatch and transmission purchases.
  - $400,000 was forecast to be paid to Power Services for generation redispatch, transmission purchases, and purchases and/or sales of energy under Attachment M.
  - $200,000 was forecast for the non-federal redispatch costs.

	Actual Costs for FY 2009 and FY 2010			
	Costs Attributable to Attachment M		Costs Attributable to the Puget Sound Area Network Integration (PSANI) Redispatch Program	
	FY 2009	FY 2010	FY 2009	FY 2010
October	$5,856	$1,510	$0	$0
November	$165,427	$0	$0	$0
December	$129,020	$1,765	$0	$0
January	$0	$0	$0	$0
February	$208	$14,546	$0	$0
March	$9,630	$364	$0	$0
April	$154,665	$15,192	$31,654	$0
May	$7,784	$34,688	$0	$0
June	$566	$1,373	$0	$0
July	$1,630	Not Yet Reported	$0	Not Yet Reported
August	$354		$0	
September	$100,602		$0	
Totals	***$575,743***	***$69,438*** through June 2010	***$31,654***	***$0*** through June 2010

Potential FY 2012-2013 Rate Case Items

- Budget Forecasts- BPA's current budge forecast for FY 2012-2013 under the Integrated Program Review (IPR) is $400,000 per annum for Attachment M redispatch.
- The Regional Redispatch Pilot Program has been discontinued, and thus costs of this program will no longer be included.
- PSANI Redispatch Program- Discussions are currently underway regarding development of a new PSANI Redispatch Program. The preliminary budget forecast is $200,000 per annum.
- Due to the variable nature of transmission system operations and the difficulty in predicting congestion events, it is proposed that the FY 2010-2011 budget forecast values be continued through the FY 2012-2013 rate period.

Balancing Service Election

Balancing Service Election for FY 2012-2013

- BPA proposes to establish a requirement that Generating Customers subject to Within-Hour Balancing Service rate make a Balancing Service Election. This election is similar to the Operating Reserves election currently required for Transmission Customers.

- The Balancing Service Election is a declaration by a Generating Customer that provides detail on whether it will take one or more elements of Within-Hour Balancing Service and Generation Imbalance Service from BPA, self-supply those Control Area Services, or dynamically-schedule the energy from the generator out of the BPA Balancing Authority Area (BAA).

Balancing Service Election for FY 2012-2013 (continued)

- Generating Customers must establish an initial Balancing Service Election (and if necessary for Self-Supply of Control Area Services, a Balancing Plan) if they are currently interconnected to the BPA BAA or expect to interconnect during the FY 2012-2013 rate period.
  - The initial Balancing Service Election will be for the FY 2012-2013 rate period.
  - The Generating Customer must make this election by May 1, 2011.
  - BPA may establish a longer minimum term for the election for subsequent rate periods.

Balancing Service Election for FY 2012-2013 (continued)

- BPA will develop a Business Practice that describes the requirements for the Balancing Service Election. We expect the election form will be a document similar to a Network Resource Designation for NT Resources.

- Customers that elect to self-supply but are unable to maintain self-supply status for the entire FY 2012-2013 rate period, and Customers that accelerate a post-FY 2012-2013 expected interconnection into the FY 2012-2013 rate period will receive Provisional Balancing Service for the remainder of the rate period.

- As we discussed in previous workshops, Provisional Balancing Service is subject to a lower threshold of Balancing Reserves deployed for triggering Dispatchers Standing Order (DSO) 216.

Balancing Service Election for FY 2012-2013 (continued)

- **Self-Supply or Dynamic Transfer**
  - If the Generating Customer elects to self-supply or dynamically transfer the output to another BA, the customer must demonstrate that it has a sufficient allocation of Dynamic Transfer Capability on BPA's system to accommodate the self-supply or transfer.
  - For the Self-Supply option, the customer must also demonstrate it can supply necessary balancing resources. This would require a Balancing Plan. Specific information would be required in the Balancing Plan including, but not limited to, resource owner, location, ramp rate, inc/dec capability, max ramp rate and fuel.

Thermal Generator Treatment Alternatives

Thermal Generator Use of Balancing Capacity Concepts for Discussion

- How best to address the use of balancing capacity by thermal generators through rates.
- Transmission Account Executives are scheduling one-on-one meetings with Generating Customers about their use of balancing capacity. These Customers have not participated in BPA workshops so the individual meetings may help us understand whether the use of balancing capacity by some generators is an unavoidable consequence of their operating characteristics or is something they can control.

Thermal Generator Use of Balancing Capacity (continued)

- BPA analysis found that non-Federal thermal generation used 69 MW Incremental and 86 MW Decremental Balancing Reserves during the study period (10/1/07– 9/30/09).

- Use of Balancing Reserves results from three causes:
  - Inaccurate scheduling during plant start-up
  - Plant output changing outside of the hourly ramp periods
  - Inaccurate scheduling during plant shut-down.

- The use of these reserves is not uniformly distributed across all non-Federal thermal generators. A few plants account for the majority of Balancing Reserve uses.

Thermal Generator Use of Balancing Capacity (continued)

- **Relationship Between Generator Imbalance (GI) Service and Thermal Balancing Capacity**
  - GI settles for the energy difference (deviation) between the scheduled and actual output from a generator. Deviations within Band 1 (the larger of 1.5% or 2 MW) may be returned during the month to bring the deviation account balance to zero. Any deviation carries an associated use of balancing reserves. However, the balancing reserve use can be significantly greater than the deviation as the plant output can swing above and below the hourly average.
  - For hours where there is near-zero deviation, there can still be use of balancing capacity outside of ramp periods. Plants that move across the hour from one ramp period to the next may have zero deviation at the 30 minutes into the hour point and have zero net energy deviation but can use both incremental and decremental reserves during the hour.

Thermal Generator Use of Balancing Capacity Potential FY 2012-2013 Rate Alternatives

- **1. Cost Causation and a Rate for Cost Recovery for Use of Balancing Capacity**
  - Since a few thermal generators are responsible for the majority of balancing reserves used during the study period, establishing a rate where the billing factor is based on Nameplate Capacity does not seem to be consistent with cost causation. There is also a possibility that establishing a rate that is not tied to an individual plant's use of balancing reserves could result in greater use of balancing reserves as plants would have no incentive to reduce their use of that capacity.
  - Establishing a rate that is based on actual use of capacity outside of ramp periods would present an implementation challenge, but would align use of balancing capacity with charges. If we hold reserves for thermals, there could be an allocation between thermals based on use to recover costs for the reserves held.
  - If we proceed with changing the billing factor for Wind Balancing Service to a use-based allocation of the costs of reserves, this approach would fit well.

Thermal Generator Use of Balancing Capacity Potential FY 2012-2013 Rate Alternatives

- **2. Penalty Rate for Use of Balancing Capacity:**
  - If we do not hold reserves for thermal generators' use of balancing capacity, then there is no revenue requirement and no need for a rate. In that case, it may be appropriate to establish a penalty that would be applied when those reserves are used. For example, the maximum 60-second deviation outside of ramp periods both above and below the hourly schedule could be used to calculate the penalty. If no thermal generators require balancing capacity during any given hour, then there are no penalties to apply.
  - The amount of the penalty should be large enough to incent thermal generators to control plan output to avoid use of capacity but should not be excessively punitive.

Thermal Generator Use of Balancing Capacity Potential FY 2012-2013 Rate Alternatives

- **3. Status Quo:**
  - This alternative would be to not establish a rate or penalty for use of balancing capacity by thermal generators. It is possible that once we have discussed the use of these reserves with thermal generating customers, the use of these reserves may decrease. This alternative presents more risk to BPA as there would be no real incentive for these customers to change how they operate their plants, and continued use of balancing reserves would be uncompensated. In addition, there is an associated cost-shift risk to other customers.

Mid-Rate Period Adjustment of the Wind Balancing Service Rate

Mid-Rate Period Adjustment to the Wind Balancing Service Rate

- The current Wind Balancing Rate provides a tradeoff between the quality of service and the rate level.
- The current Wind Balancing Rate provides the flexibility to increase the rate and commensurate level of balancing reserves under certain circumstances. (See 2010 Rate Case ROD, WP/TR-10-A-02, 468-470.)
- Rate schedule provides for the rate to be adjusted under certain conditions
  - In response to a request from one or more participants in the Pacific Northwest utility industry, including regional organizations, to increase the amount of balancing reserves set aside.
  - Due to a legal challenge, BPA is prevented from implementing DSO 216 or is required to amend it materially.

Mid-Rate Period Adjustment to the Wind Balancing Service Rate (continued)

  - BPA will conduct a public process before making such a decision.
  - On 30 days' written notice posted on BPA's OASIS, BPA may increase the rate with a commensurate increase in the amount of balancing reserves.
- In previous workshops we have discussed the 99.5% and 99.7% probability levels of balancing reserves.
- BPA proposes to retain the flexibility of a mid-rate period adjustment to the Wind Balancing Service rate under the same criteria.
  - The level of balancing reserve associated with 99.5% probability would be used to set a rate in the 2012 BPA Initial Proposal.
  - The Initial Proposal would also contain a wind balancing reserve forecast and cost allocation for the 99.7% level of service for the mid-period rate adjustment provision in the rate schedule.

Rate Design Billing Determinant Concepts

Outline

- Issue Overview
- Review rate making principles
- Review proposed rate concepts
- Decide next steps

The Issue

- **What:**
  BPA is considering whether to change the billing determinant for within-hour balancing capacity from plant nameplate to an alternative. Renewable Northwest Project (RNP) suggested at May 27 workshop that this be examined.

- **Why:**
  To better align monthly bills with the use of reserve capacity.

- **How:**
  Find new potential billing determinants with which to divide the fixed revenue requirement for within-hour balancing reserves among users on a pro-rata basis based on consumption of reserve capacity. ***(Note: Revenue recovery would be assured – but individual customers bills would vary depending on their share of capacity usage)***

Background

- In addition to established rate making principles, any Billing Determinant should reflect that:

- The Wind Balancing Service is a capacity-based service
  - Not an energy-based service which is billed separately under EI/GI rate schedules,
  - Not a penalty. Persistent deviation is penalty charge for poor scheduling practices.

- Any new Billing Determinant doesn't change the fixed revenue requirement recovery through rates,
  - allocates a fixed revenue requirement to customers
  - recovers the total revenue during the billing period
  - measures approximate usage of reserves by customers and bills on pro-rata basis

Other Considerations:
The Billing Determinant:

- Is practical and understandable (easily billed)
- Rewards locational diversity, where appropriate
- Could be applied to other generator types (important if we intend to bill for within-hour balancing service reserves other generator types)
- Is compatible with self-supply for generation imbalance
- Encourages accurate scheduling practices.

Summary of Rate Design Concepts

Method	Description
1) Nameplate (status quo)	Plant nameplate
2) RNP Proposal	Adjust Nameplate for Regulation and Following and base energy component on Net Imbalance Energy (see slides 46 and 47)
3) Incremental Standard Deviation	Measure wind fleet standard deviation and allocate by Incremental Standard Deviation method
4) Other choices?	To be determined

Concept 1: Plant Nameplate (Status Quo) (for comparison purposes)

Structure:

- Separate rate for wind
- Billing determinant = nameplate

Pros:

- Simple to understand and bill
- Reasonable proxy for average reserve need
- Financials on both ends are well known and predictable

Cons:

- Doesn't target individual differences in reserve use

Concept 2: RNP Proposal

Structure:

- Wind Balancing Service billing determinants: (see next page for more detail)
  (1) Regulation & Load Following: [Nameplate ^ (1+x)]
  (2) Replace the nameplate of installed capacity with net imbalance energy
- Don't use gen imbalance hours where the plant imbalance offsets system Imbalance

Pros:

- May incent diverse locations if new project less correlated with Gorge projects

Cons:

- Clear incentive to schedule in opposite direction from rest of BPA wind fleet
- Seems complex to split bill by components
- Could seem like duplicate energy charge to some

Questions:

- Is this better correlated with capacity needed by project than nameplate?
- Does this work for other resource types?
- Does splitting Regulation and Following from Imbalance help?

Concept 2: RNP Proposal (more details)

Regulation & Load Following:

- [Nameplate ^ (1+x)] is billing determinant,
  - "x" determines convex (< 0) or concave (>0) shape
  - "x" found by regression (nonlinear) against historically required reserves by plant

Balancing:

- Total of Censored Absolute Deviations is billing determinant,
  - Add hourly net imbalance energy for each hour of billing period
  - Use absolute value (positive for both incs and decs)
  - Censor gen imbalance to 0 for the hours where plant imbalance offsets system imbalance

Concept 3: Incremental Standard Deviation

Structure:

- Monthly share of reserve variance (using Incremental Standard Deviation) is billing determinant

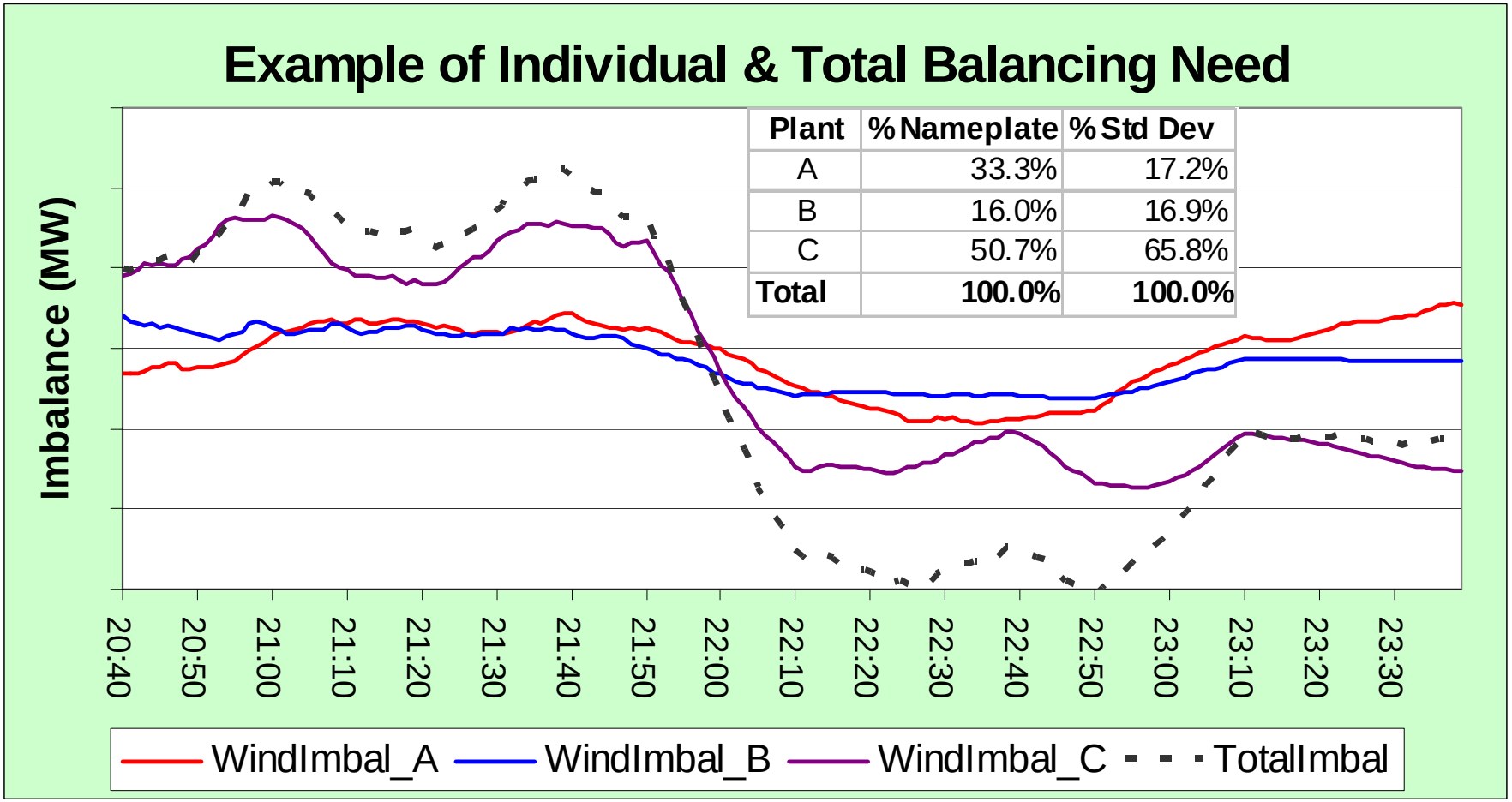
Pros:

- Standard deviation allocation is a generally accepted capacity measure
- Related to Used Volume of Reserves
- Clear incentive to schedule better
- Incents diverse location
- Single measure may work for other generation types
- Calculation is same as rate case requirement method

Cons:

- Calculation isn't "simple math." It would require publication of method, explanation, verification tool.
- Requires looking "inside hour." Calculation would be external to billing system and require other than MV90 billing meter quality data.

Example ISD


Example of Individual & Total Balancing Need
Imbalance (MW)
Plant | %Nameplate | %Std Dev
A | 33.3% | 17.2%
B | 16.0% | 16.9%
C | 50.7% | 65.8%
Total | 100.0% | 100.0%
20:40
20:50
21:00
21:10
21:20
21:30
21:40
21:50
22:00
22:10
22:20
22:30
22:40
22:50
23:00
23:10
23:20
23:30
WindImbal_A
WindImbal_B
WindImbal_C
TotalImbal

Concept 4: Other Choices

Structure:

- Investigate one or two additional alternatives developed internally or suggested by customers

Pros:

- Simpler than ISD?
- Could have all the benefits of ISD:
  - Clear incentive to schedule better
  - Incent diverse location
  - Single measure might work for other generation types

Cons:

- Calculation may not be “simple math.” It could also require publication of method, explanation, and verification tool.
- Could require looking “inside hour.” Calculation would be external to billing system. Requires other than MV90 billing meter quality data.

Feedback: Next Steps

- Should we investigate this? (Report out in September workshop)
  - Test several performance-based metrics
  - Rank relative effectiveness at measuring reserves used

- Your questions that need to be investigated?
  - Process
  - Policy
  - Concerns / fears / likes?

- Suggestions for methods to measure capacity used?

email TechForum@bpa.gov **Subject:** 2012 Rate Case

Persistent Deviation Alternatives

Persistent Deviation Outline

- Background
  - Current Persistent Deviation Definition
  - Goals of PD
  - Rate Case Assumptions
  - Risk Management
- Issues for 2010 Rate Period
- Current Business Practice Energy Imbalance
- Current Business Practice Generation Imbalance
- Part A PD Events Retrospective
- Proposed Business Practice
- Waivers
- 2012 Rate Period

Current Persistent Deviation Definition

A Persistent Deviation is one or more of the following:

a) For Generation Imbalance Service only:

Negative deviation (actual generation greater than scheduled) or positive deviation (generation is less than scheduled) in the same direction for four or more consecutive hours, if the deviation exceeds both: (i) 15% of the schedule for the hour, and (ii) 20 MW in each hour. All such hours will be considered a Persistent Deviation.

b) For Energy Imbalance Service only:

Negative deviation (energy taken is less than the scheduled energy) or positive deviation (energy taken is greater than energy scheduled) in the same direction for four or more consecutive hours, if the deviation exceeds both: (i) 15% of the schedule for the hour, and (ii) 20 MW in each hour. All such hours will be considered a Persistent Deviation.

c) A pattern of under-delivery or over-use of energy occurs generally or at specific times of day.

Part C applies to both Generation Imbalance Service and Energy Imbalance Service.

Goals of Persistent Deviation

- Assure hydro operations close to plan
  - Maintain quantity of reserves available (reliability)
  - Avoid risk to non-power constraints
  - Ensure BPA is not dependent on market to meet non-power constraints
  - Avoid market risk
  - Reduce causes of hydro operations uncertainty
- Provide an incentive to adopt best scheduling practices and correct schedule deviations. Encourage parties to move schedule errors toward zero, and help ensure that schedule errors are random and non-persistent, bias is minimal, and errors are related only to unpredictability of load or variable generation.
- Discourage use of schedule error as marketing alternative.
- Allow BPA to make assumptions regarding scheduling behavior that keeps reserve requirements and costs as low as possible, and focus reserve deployment on anticipated reserve needs.
- If underlying assumptions are violated, PD provides a mechanism for charging only the parties that violated rather than increasing reserve requirements and costs for all parties.

Rate Case Assumptions

- BPA establishes estimated balancing reserve capacity requirements in each rate case. To keep balancing reserve requirements as low as possible, various assumptions were made regarding scheduling behavior. The assumptions include:
  - Dispatchable generators operate to schedule, except for contingencies, and generation ramps between h:50 and h+1:10.
  - Schedule errors for loads and for variable energy resources are associated only with forecast error.
  - Schedule errors are not biased due to marketing objectives, DSO 216 avoidance, or failure to adjust schedules.
  - Schedule accuracy for wind generation is assumed to be as good as or better than a benchmark 30-minute persistence level of scheduling accuracy, on average.
  - Energy accumulation due to providing imbalance service approximately nets to zero; imbalance is not biased over time.

Risk Management

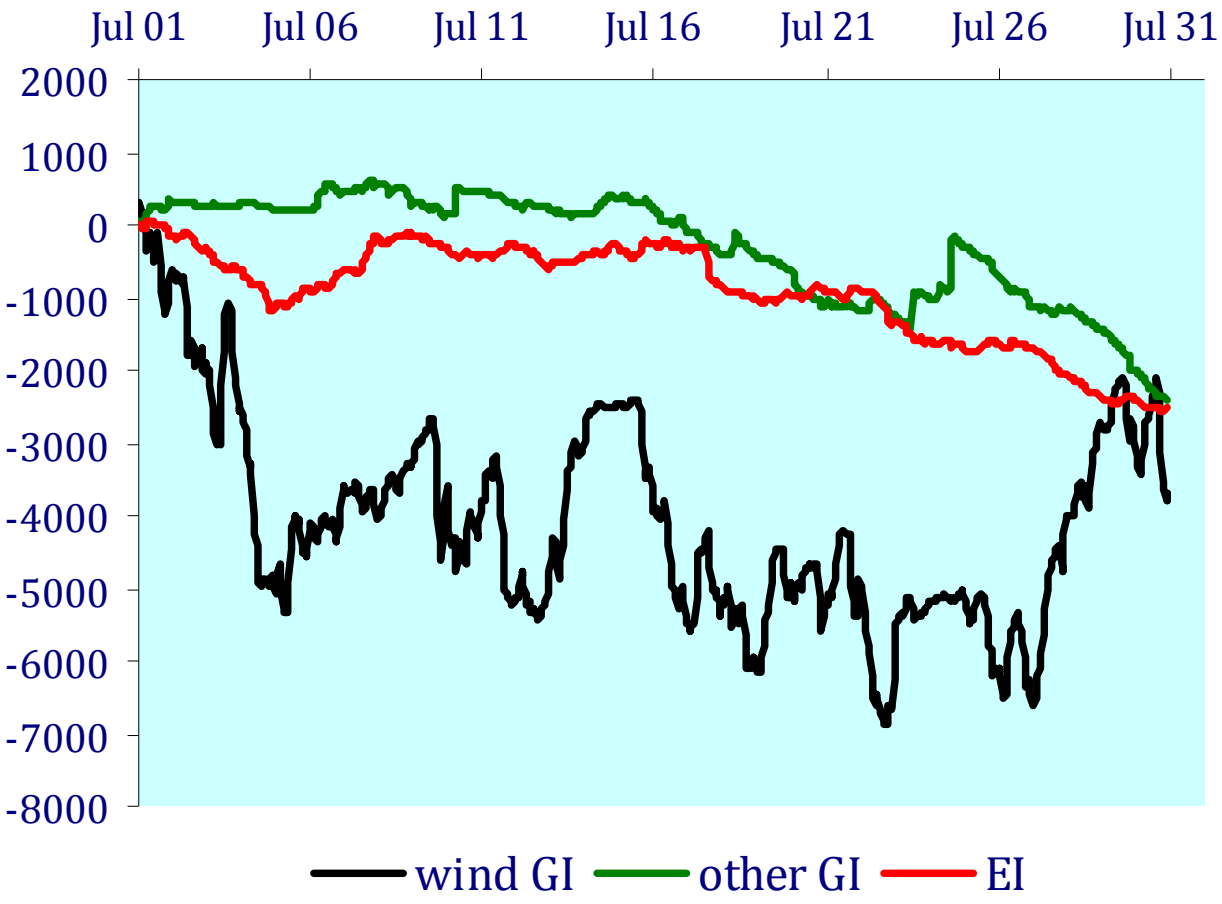
- If BPA did not make these assumptions, or if we assume deliberate schedule error is a possibility, there is a wide range of what could happen. Such an approach would end up distributing costs for inaccurate scheduling to all parties, and therefore motivate further decline in scheduling accuracy.

- When BPA makes assumptions in setting rates, risk must be managed:
  - DSO 216 limits risk associated with the quantity of balancing capacity that BPA makes available.
  - Energy and Generation Imbalance rates pegged to index limit energy cost risk.
  - Persistent deviation penalties limit misuse of service risk.

Issues

- In March and April, BPA provided information indicating that although the PD penalty appeared to be affecting scheduling behaviors, not all the changes were consistent with BPA's intent.
  - Some generators and loads were staying within the "Part A" definition (<20 MW and <15% of schedule) but schedule error was biased in one direction.
  - Some schedulers were biasing in one direction for three hours, then crossing zero for one hour, or were biased in one direction crossing into the 20 MW band once every few hours.
  - Some schedules were not adjusted hourly during light load hours.
- As a result, it appears necessary for BPA to:
  - Clarify that balancing service provides for unavoidable schedule error, and identify types of schedule error that are outside the scope of balancing service.
  - Provide a mechanism to reduce or limit imbalance accumulation
  - Provide examples of patterns of deviation that would be treated as persistent deviations.
- BPA has described its intent to strengthen enforcement of patterns of schedule error in Joint Operating Committee (JOC) discussions and customer forums.

Retrospective
Imbalance Accumulation Example



Negative accumulation means actual gen or load >schedule

Retrospective: Part A PD Events

Plant	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Total
1			21	20	14	31	27	27	19	22	181
2	7	17	3		1	12	5	2	3	2	52
3	4	13	8	1	1	3	2	1		1	34
4	1	2		1	1	8	5	1	3	1	23
5	7	9	2	1	1	1	1			1	23
6	1	3	3			2	1	1			11
7	2	2	2	1		3		1			11
8	3	6									9
9		3	3			1		1			8
10				1		5	1		1	1	9
11		1		2		3					6
12				2	1			1			4
13						3					3
14	1	1		1							3
15						1			1		2
16								1			1
17							1				1
18									1		1
19						1					1
20											
21											
22											
23											
24											
25											
Total	26	57	42	30	19	74	43	36	28	28	

Retrospective (continued)

- Many wind plants are successfully avoiding Part A PD events most of the time (10 plants have had 1 or 0 PDs over 10 months; 5 plants have had 3-5 events over the 10 months; 68% of all 383 events over 10 months were incurred by three plants.
- Since the March discussions there has been continued improvement in PD avoidance.
- BPA believes that PD helps identify poor scheduling practices and motivate parties to develop contractual arrangements that allow for accurate scheduling.

Current Business Practice – Energy Imbalance

Examples provided for Energy Imbalance include:

2.17.1 Negative deviations greater than band 1 for 72 or more consecutive hours.

2.17.2 Positive deviations greater than band 1 for 72 or more consecutive hours.

2.17.3 Negative deviations greater than band 1 for 3 or more consecutive days at a specific time of day.

2.17.4 Positive deviations greater than band 1 for 3 or more consecutive days at a specific time of day.

2.17.5 Deviations greater than band 1 for 5 or more consecutive periods (HLH, LLH, HLH, or LLH, HLH, LLH) that are positive during the HLH period(s) and negative during the LLH period(s).

The business practices note that BPA may find other deviations to be Persistent Deviations as well.

Current Business Practice – Generation Imbalance

Examples provided for Generation Imbalance include:

4.2.1 Negative deviations (overgeneration) greater than Band 1 for 6 or more consecutive LLH hours.

4.2.2 Positive deviations (undergeneration) greater than band 1 for 6 or more consecutive HLH hours.

4.2.3 Negative deviations greater than band 1 for 3 or more consecutive days at a specific time of day.

4.2.4 Positive deviations greater than band 1 for 3 or more consecutive days at a specific time of day.

4.2.5 Accumulated deviations greater than band 1 for 3 consecutive periods (HLH, LLH, HLH) or (LLH, HLH, LLH) that are positive during the HLH period(s) and negative during the LLH period(s).

The business practices note that BPA may find other deviations to be Persistent Deviations as well.

Proposed Additional Persistent Deviation Examples

BPA proposes to strengthen Persistent Deviation identification and enforcement for the 2012 rate period. Although BPA cannot change the 2010 rate schedule, we may include some of these examples as changes to the business practice, and the 2012 initial proposal will include stronger language regarding persistent deviation. Changes BPA may propose include:

1) Modifying the existing language under Part A to tighten the bands and/or time window. Possible examples include:
   a. 3 hours and greater than both 20 MW and 15% of schedule
   b. 4 hours and greater than both 15 MW and 15% of schedule
2) Adding constraints for a narrower band over longer periods, including
   a. Hourly Deviations greater than both 10 MW and 7.5% of schedule, in the same direction for six or more hours;
   b. Hourly deviations greater than 5 MW and 1.5% of schedule in the same direction for 12 or more hours;
   c. Hourly deviations greater than 2 MW and 1.5% of schedule in the same direction for 24 or more hours;
3) Significant bias in imbalance accumulation over time or for specific times of day such as for heavy load or peak hours or for light load hours;
4) Deviations due to failure to submit a schedule for a specific hour or due to failure to adjust schedules from hour to hour as needed.

Waivers

- The Energy Imbalance and Generation Imbalance Business Practices provide BPA discretion to grant waivers of Persistent Deviation penalties.

- BPA wants to clarify that it views the application of waiver to be relevant only for extreme circumstances. As noted in earlier workshops, the time and MW bands allowed for schedule error are intended to encompass variability due to load or variable generation volatility and unpredictability.

Discussion

Next Steps

- **<u>16 September 2010</u>:**
  - Billing Determinant
  - Energy Shift Inc Variable Costs
  - Formula Rate Design Proposal
  - Thermal Generator Treatment
  - Rate Design

Wrap Up

- BPA would like to continue to receive your feedback regarding the topics we discussed today.
- Share your view today or feel free to submit a written response to:
  - techforum@bpa.gov.
  - Please state “2012 Rate Case” in the subject line.
- Our intent is to understand customer interest and the priority of topics to capture in the parking lot. This information will also inform us of the topics of interest to focus on as we develop the workshop schedule.
- We look forward to working together on these complex issues.