DIRECT TESTIMONY of

DR. MARC HELLMAN, ROBERT CLARK AND MATTHEW MULDOON

Witnesses for the Public Utility Commission of Oregon

SUBJECTS: DEVELOPMENT OF RESIDENTIAL EXCHANGE BENEFITS, APPLICATION OF COST RECOVERY ADJUSTMENT CLAUSES TO RESIDENTIAL EXCHANGE BENEFITS AND WIND INTEGRATION—WITHIN HOUR BALANCING SERVICE RATE PROPOSAL

Section 1: Introduction and Purpose of Testimony

Q. Please state your names.

A. My name is Dr. Marc Hellman.

A. My name is Robert Clark.

A. My name is Matthew Muldoon.

Q. On whose behalf do you provide testimony?

A. The Public Utility Commission of Oregon "OPUC."

Q. Have you prepared qualification statements?

A. Yes we have. The qualification statement for Dr. Marc Hellman is provided in WP-10-Q- PU-1.

A. The qualification statement for Robert Clark is provided in WP-10-Q-PU-2.

A. The qualification statement for Matthew Muldoon is provided in WP-10-Q-PU

Q. What is the purpose of this direct testimony?

A. We propose a revision to the 7(b)(2) Implementation Methodology with respect to deriving the appropriate level of residential exchange benefits. We also address the application of Cost Recovery Adjustment Clauses ("CRACs"). Finally we make a recommendation regarding BPA's proposed Wind Integration – Within Hour Balancing Service Rate Proposal.

Section 2: Revision to 7(b)(2) Implementation Methodology

Q. Please discuss the first issue: a revision to the 7(b)(2) Implementation Methodology for establishing residential exchange benefits.

A. We propose a change to how the 7(b)(2) study results are translated into residential exchange benefits that should be provided for the rate period. The current methodology focuses on the level of costs that need to be excluded in order to provide rate protection for the public utilities required by federal statute. Using this approach can yield counter intuitive and unstable results, and, in our view, is inequitable in the context of the 7(b)(2) analysis. We propose a different approach, which is to look at the level of residential exchange benefits that can be provided over the study period while still providing the 7(b)(2) Rate Test protection.

Q. Please explain?

A. The approach in the 7(b)(2) Implementation Methodology is to identify the average level of costs to be excluded by taking the average difference between the discounted Program Case and 7(b)(2) Case Rates. (WP-10-E-BPA-06, page 24). Even in the instances where the 7(b)(2)-allowed residential exchange benefits within the 7(b)(2) study are relatively stable or even increasing, the current Implementation Methodology would significantly reduce the level of residential exchange benefits provided in the rate period by way of the averaging of the discounted rate differences between the Program and 7(b)(2) Cases.

Consider the table on the following page which shows illustrative discounted values by year:

Table 1: Residential Exchange Benefits and Excluded ASC

Year=>	2010	2011	2012	2013	2014	Average
Residential Exchange Benefits	$ 250	$ 250	$ 250	$ 250	$ 250	$ 250
Program Case Costs Excluded	$ 100	$ 200	$ 300	$ 400	$ 500	$ 300
Total Exchange Costs	$ 350	$ 450	$ 550	$ 650	$ 750	$ 550

Table 1 reflects a pattern that would be consistent with growing investor-owned utility average system costs. As ASC increases each year, the level of costs that would need to be excluded from the Program Case to provide the 7(b)(2) rate protection increases. However, the current 7(b)(2) Implementation Methodology always excludes the average level of these increasing costs. Accordingly, when the Implementation Methodology is applied to these examples to determine the appropriate level of costs to exclude, the level of allowable residential exchange is significantly reduced.

Q. Please explain your concern regarding this approach?

A. If you look at the second row of Table 1 labeled "Residential Exchange Benefits," you can see that the level of exchange benefits that is assumed to be allowable, meaning that is meeting the 7(b)(2) protection requirements, is constant in each year at $250 million. Yet exchanging utilities do not receive $250 million in exchange benefits. In Table 1, the level of excluded costs increases each year. Because the Implementation Methodology essentially uses the average level of costs excluded from PF Preference Rates, residential exchange benefits in the rate period are reduced from the amount determined to be an allowable amount under the Rate Test. In the above example, the Implementation Methodology would increase program cost exclusion from $100

million to $300 million and decrease residential exchange benefit from $250 million to $50 million for the year 2010.

Q. Can you demonstrate the instability of residential exchange benefit calculation for the rate period using BPA's RAM2010 model?

A. Yes. RAM2010, which supports BPA's initial proposal, contains the following IOU net exchange benefit table in the Pub Exchange tab (rows 425 through 433).

Table 2: IOU New Allocation Scheme Net Exchange Benefits

	FY2010	FY2011	FY2012	FY2013	FY2014	FY2015
Avista	$14,949	$16,540	$19,521	$23,221	$27,091	$31,147
Idaho Power	-	-	-	$0	$0	$0
Northwestern Energy	$3,887	$3,641	$4,552	$5,332	$5,975	$6,923
PacifiCorp	$47,212	$44,114	$43,685	$44,121	$56,630	$72,485
Portland General	$68,952	$71,582	$84,596	$92,345	$102,377	$111,655
Puget Sound Energy	$116,462	$121,480	$138,305	$150,533	$166,941	$185,882
Total	$251,462	$257,358	$290,660	$315,552	$359,014	$408,092

These net exchange benefit calculations are based on average ASC of exchanging utilities increasing from $55.65 in FY 2010 to $59.98 in FY 2015. This is shown in Table 3 on the following page, in the row titled, "RAM2010."

Table 3: RAM 2010 and Alternative ASC Trajectories

	FY2010	FY2011	FY2012	FY2013	FY2014	FY2015
RAM2010	$55.65/MWH	$56.74/MWH	$57.59/MWH	$58.19/MWH	$59.09/MWH	$59.98/MWH
Alternative 1	$56.65/MWH	$56.74/MWH	$54.85/MWH	$52.78/MWH	$51.04/MWH	$49.34/MWH
Alternative 2	$55.65/MWH	$56.74/MWH	$60.74/MWH	$64.15/MWH	$68.40/MWH	$72.90/MWH

For illustrative purposes, OPUC ran two alternative cases. First, Alternative 1 in Table 3 shows a decline in average ASC beginning in FY2012. OPUC then ran this Alternative 1 in entire case mode yielding the following results for the same table:

Table 4: IOU New Allocation Scheme Net Exchange Benefits: Alternative 1

	FY2010	FY2011	FY2012	FY2013	FY2014	FY2015
Avista	$19254	$21260	$16021	$9837	$5984	$0
Idaho Power	-	-	-	$0	$0	$0
Northwestern Energy	$4922	$4633	$4012	$3052	$1937	$1064
PacifiCorp	$60183	$56443	$34637	$12578	$7718	$0
Portland General	$86977	$90494	$77322	$58881	$38823	$20941
Puget Sound Energy	$146383	$153055	$129117	$102739	$69159	$44547
Total	$317719	$325885	$261110	$187087	$123621	$66552

In Alternative 1, with average assumed ASC declining 3.43 percent per year in the post rate period, total net IOU exchange benefits for the rate period jumped from an average of $254,410 per year in the initial proposal to an average of over $321,802 per year; an increase of slightly more than 26 percent. (The

$321,802 value is calculated by taking the average of the two "Total" values shown in Table 4 above for the years FY 2010 and FY 2011.)

In Alternative 2, OPUC increased average exchange ASC at a faster rate than in BPA's initial proposal. OPUC increased average ASC of exchanging utilities from 56.74 $/MWH in FY 2011 to 72.90 $/MWH in FY 2015. OPUC then ran Alternative 2 yielding the following results for the same table:

Table 5: IOU New Allocation Scheme Net Exchange Benefits: Alternative 2

	FY2010	FY2011	FY2012	FY2013	FY2014	FY2015
Avista	$10205	$11255	$22943	$38097	$53445	$71891
Idaho Power	-	-	-	$0	$0	$0
Northwestern Energy	$2697	$2505	$5055	$7884	$10782	$14243
PacifiCorp	$32524	$30148	$52636	$79103	$118472	$169199
Portland General	$48126	$49666	$90973	$129099	$176383	$223405
Puget Sound Energy	$81536	$84602	$146267	$202969	$278580	$357455
Total	$175087	$178176	$317874	$457112	$637662	$836193

In Alternative 2, average assumed ASC increases 6.47 percent per year in the post rate period instead of 1.4 percent per year as in BPA's initial proposal. As a result, in Alternative 2, total net IOU exchange benefits for the rate period dropped from the initial proposal amount of $254,410 per year to an average of $176,632 per year; nearly 31 percent less. (The $176,632 value is calculated by taking the average of the two "Total" values shown in Table 5 above for the years FY 2010 and FY 2011.)

Q. *Has BPA expressed concern about the variability of rate period net exchange benefits because of changes in out year ASC trajectory assumptions?*

A. Yes. At BPA's 2010 Rate Case, Power Rates (WP-10) Customer Workshop held on December 3, 2008, BPA illustrated swings in rate period net exchange benefits caused by altering ASC trajectory assumptions. These illustrations can be found in WP-10-E-PU-2. That exhibit provides a copy of BPA's "Section 7(b)(2) Rate Test and Out Year REP Benefits," pages 12 through 19, Cases 0, 1, and 4 in particular. Case 0 is the Base Case, where ASC is essentially maintained at its rate period level. The resulting net exchange benefit in total (both IOU and Public) is $267 million for the rate period (FY 2009). Case 1 of the BPA workshop handout is an alternative case in which ASCs escalated at a steady rate of 6.8 percent per year, all else equal. The resulting net exchange benefit in total fell to about $140 million for the rate period; over 50 percent from the Base Case. Case 4 of the BPA workshop handout is an alternative case in which ASCs declined at a rate of about 2.4 percent per year, all else equal. The resulting net exchange benefit in total increased to $309 million for the rate period; about 16 percent.

Q. Do you recommend an alternative approach?

A. Yes. We recommend that focus not be placed on the level of residential exchange costs that must be excluded from PF rates and instead focus on the level of residential benefits that can be provided to residential and small-farm customers while still providing preference customers the statutorily-required rate protection. In most regional discussions regarding an equitable level of residential exchange benefits, while there may widely varying views on the level of benefits, focus is placed on the level of residential benefits and not on how much costs should be excluded from rates.

Therefore, instead of moving up protection amounts for out-year changes through the trigger rate mechanism, we recommend focus be placed on the residential exchange benefits that are available to exchanging customers over the entire study period.

Q. How could this work?

A. BPA's Initial proposal includes the table on the following page, appearing in Pub Exchange tab, RAM2010, 2010 BPA Rate Initial Proposal (WP-10) website.

Under one of OPUC's alternative approaches, the rate period net exchange benefit would equal the average net exchange benefits across the study period, FY2010 through FY2015, for all the investor-owned utilities in aggregate. (This table of benefits has already been reduced by PF Preference Protection Amount.) To this end, a column for average could be added as follows:

Table 6: IOU New Allocation Scheme Net Exchange Benefits

	FY2010	FY2011	FY2012	FY2013	FY2014	FY2015	Average
Avista	$14,949	$16,540	$19,521	$23,221	$27,091	$31,147	$22,078
Idaho Power	-	-	-	$0	$0	$0	
Northwestern Energy	$3,887	$3,641	$4,552	$5,332	$5,975	$6,923	$5,052
PacifiCorp	$47,212	$44,114	$43,685	$44,121	$56,630	$72,485	$51,375
Portland General	$68,952	$71,582	$84,596	$92,345	$102,377	$111,655	$88,585
Puget Sound Energy	$116,462	$121,480	$138,305	$150,533	$166,941	$185,882	$146,600
Total	$251,462	$257,358	$290,660	$315,552	$359,014	$408,092	$313,690

Using a straight average approach would yield an average of $ 313,690.

Q. Do you have an exhibit that displays OPUC's alternative approaches?

A. Yes. Exhibit WP-10-E-PU-3 provides alternative approaches to calculating rate period residential exchange benefits. Summary portions of that exhibit are shown below:

Table 7: RAM 2010 and OPUC Alternatives

RAM 2010 Results

	2010	**2011**	2012	2013	2014	2015
			IOU REP Benefits (Millions)			
WP-10 BPA initial	$251.5	$257.4	$290.7	$315.6	$359.0	$408.1
OPUC alt# 1	$317.7	$325.9	$261.1	$187.1	$123.6	$66.6
OPUC alt# 2	$175.1	$178.2	$317.9	$457.1	$637.7	$836.2

	(A) Simple Ave. study Period	(B) Ave. BPA disc. Study per'd	(C) Ave. of Ave rate & post rate periods	(D) Benefit w/ infl. Adj First Year	(E) BPA Current Method
WP-10 BPA initial	$313.7	$246.1	$289.7	$274.5	**$254.4**
OPUC alt# 1	$213.7	$179.2	$237.4	$199.7	$321.8
OPUC alt# 2	$433.7	$326.3	$353.0	$363.2	$176.6
Average	$320.3	$250.5	$293.4	$279.1	$250.9
Standard Deviation	$110.2	$73.6	$57.9	$81.9	$72.6
Std Deviation to Avg (%)	34%	29%	20%	29%	29%

The upper half of Table 7 displays the residential exchange benefits that are derived using RAM2010 under different ASC trajectories. This information is gleaned from Tables 2, 4, and 5 of this testimony. Looking at the bottom half of Table 7, as well as page 1 of WP-10-E-PU-3, there are four alternatives shown. Column A displays a simple numerical average of the residential exchange benefits available over the study period. This alternative has the strength of being the simplest approach.

Column B displays a simple numerical average of the discounted residential exchange benefits available over the study period. The discount rate is that used by BPA in its analysis.

Column C is an average of the residential exchange benefits available in two time periods; the first time period is the rate period, and the average is a simple nominal average, denoted as "T1". The second time period is the study period not including the rate period. The average of this second time period is expressed in constant 2011 dollars. This average is computed by taking the average of the constant dollar residential exchange benefits, denoted as "T2". The overall average calculation is (T1 + T2)/2. This alternative has some intuitive appeal in that it gives equal weight to the 7(b)(2) analysis for the rate period as well as the forecasted residential exchange benefits beyond the rate period. And, for this second time period, the values are in constant dollars. We note that this approach also has a lower standard deviation as compared to the other methods.

Column D displays the results of taking a discounted average of the residential exchange benefits and creating a stream of payments that increases at the rate of projected inflation and maintains the same present value as the present value of the study period residential exchange benefits.

Column E is the results from BPA's direct case and is shown for comparative purposes.

Q. Earlier in your testimony you noted that the current Implementation Methodology produces counter intuitive results. Do the OPUC-identified alternatives address this concern?

A. Yes. If you look at Table 7, Column E, which shows the results using the Implementation Methodology, you can observe that under the higher trajectory

ASC path, designated as row “OPUC alt#2”, rate period residential exchange benefits decline. And if ASC’s have a lower trajectory path in the later years of the study period, rate period residential exchange benefits increase.

Under any of the OPUC alternatives, this counter-intuitive outcome is not present. Rather, under a higher ASC trajectory path, the rate period residential exchange benefits increase. And under a declining ASC trajectory path, the rate period residential exchange benefits decrease.

Note that the OPUC alternative does not result in increased residential exchange benefits in all cases compared to the current approach. Table 7 on Page 9 reflects that where ASCs are declining, every OPUC alternative, for this rate period, yields a lower result than the Implementation Methodology.

Q. Which of the OPUC-identified alternatives do you recommend?

A. We recommend Alternatives A and C. Alternative A is simplest in calculation and reflects the average level of residential exchange benefits projected to be paid over the study period. Alternative C is somewhat more stable over various scenarios and reflects equal weighting of the rate period with the rest of the 7(b)(2) study period.

Q. Do the OPUC-identified alternatives make changes to BPA’s 7(b)(2) analysis other than ASC trajectories?

A. No. We made no changes to the BPA 7(b)(2) modeling assumptions, which include financing benefits, resource stack, treatment of conservation, DSI loads, and treatment of surplus sales, or to any other modeling of the 7(b)(2) Case. The only change we made in Alternative #1 and Alternative #2 is the ASC assumptions—that is, trajectories. The key difference between the OPUC alternatives and the Implementation Methodology is what is done with the results of the analysis. Again, we focus on the level of projected residential

exchange benefits that is allowable under the Rate Test (as assumed by BPA) versus focusing on the level of costs that need to be excluded.

Q. Are the alternatives proposed by the OPUC consistent with the 7(b)(2) rate directives?

A. While we are not attorneys, we believe the OPUC alternatives are consistent with the 7(b)(2) directives. Our alternatives also assure that preference customers receive the rate protection mandated by the statute. Notably, we take the results of BPA's models and do not alter any of the analysis or modeling with respect to the five changes that are made to 7(b)(2) Case for comparison to the Program Case. We understand that one purpose of using a study period that extends beyond the rate period is to smooth out lumpy results that may occur in energy economics. We achieve the goal of smoothing the rate period results by incorporating the residential exchange benefits projected to be paid out over the study period time frame. This is accomplished through averaging the residential exchange benefits across the study period.

Q. Would a change be required in the 7(b)(2) Implementation Methodology?

A. Yes. Assuming BPA were to adopt a change in current practice, the 7(b)(2) Implementation Methodology would need to be revised.

Section 3: Application of CRACs to Residential Exchange Benefits

Q. Please move on to your next issue, the application of CRACs to residential exchange benefits. Do you agree with BPA's approach to the issue?

A. In general yes. We support BPA's approach to determining the level of reduction to residential exchange benefits resulting from application of a CRAC. BPA conducted sensitivity analysis to see how residential exchange benefits would be reduced if BPA's costs increased and recovery through a CRAC was

necessary. We support the concept of comparing scenarios. BPA's first scenario is the base case upon which proposed rates are established. BPA's second scenario is a case showing how rates would have been set, including the PF Exchange Rate, had we known the net financial reserve amounts driving the need for a CRAC. In this latter scenario, the 7(b)(2) analysis would be repeated to see how the changes in financial reserve levels change residential exchange benefits.

Q. What concerns do you have with the BPA analysis?

A. BPA's approach is to analyze how a CRAC that is needed to increase planned net revenues for risk would be allocated across customers including those that receive residential exchange benefits. At WP-10-E-BPA-04, page 52, BPA calculates that 27 percent of the revenue required by the CRAC should be recovered from residential exchange customers through reduced benefits. This calculation assumes the risk CRAC covers disappears after FY2011. We have replicated the analysis and reached the same result.

However, a more complex analysis and superior approach would be to analyze how rates would be revised if the actual cause for a reduction in reserves was modeled. For example, if a reduction in sales for resale revenues caused the need for a CRAC, BPA could model both base rates and rates assuming a lower sales-for-resale level. It is likely that residential exchange benefit levels would be different under this more specific analysis than under an analysis that simply models a reduction in reserves. The drawback to this approach is that it is more complex and does not lead to a simple rule for allocating CRACs.

Section 4: Wind Integration Costs

Q. Please move on to your next issue, the reasonableness of BPA's proposals for cost allocation for Wind Integration – Within-Hour Balancing Service (Wind Balancing). Do you agree with BPA's approach to the issue?

A. In part, yes. We support BPA's proposal to limit the amount of FCRPS capacity reserved for wind balancing by improving wind scheduling accuracy. (WP-10-E-BPA-22, Page 18, starting on Line 15.) As required reserves decrease, the embedded and variable costs BPA proposes to allocate to generation inputs are also reduced. We do not, however, support BPA's proposal that every wind generator must adhere to the same persistence forecast accuracy. Instead we think BPA should offer a rate based on a 30-minute persistence accuracy and one based on a 45-minute persistence accuracy and allow companies the opportunity to choose which rate they want.

Q. Please explain your recommendation.

A: Bifurcated self-selected 30 or 45 minute persistence wind scheduling accuracy rates for the term of the rate period would stimulate forecasting improvement and help ensure system reliability. On the other hand adopting one or the other of these persistence levels would not incent forecasting improvement *and* help ensure system reliability. If BPA adopts rates based on a 30-minute forecasting assumption, companies will certainly be incented to tighten their persistence accuracy, but it is not clear that all companies can meet this level of accuracy and thus, not clear that the BPA will really be able to decrease the level of reserves to match an assumption of 30-minute forecasting accuracy. If BPA adopts rates based on an assumption of 45-minute persistence forecasting accuracy, it is more clear that companies can meet this level of forecasting accuracy and thus more likely that BPA will be able to accurately

determine the reserve requirement. However, companies will not be incented to improve their persistence accuracy to a 30-minute level.

Q: *What is the cost savings of utilizing a thirty-minute or forty-five minute persistence based rate with its related reserves?*

A: Section IV of BPA exhibit, WP-10-BPA-24, describes the effects of a 30 or 45 minute persistence scheduling assumption driving a lower amount of reserves needed. The total estimated annual variable costs of providing reserves summarized in Section V of WP-10-E BPA-25, page 28, indicates approximately $7 M to $8 M per 15 minute persistence in scheduling accuracy. In general, within hour balancing service cost savings would be bound by the range of rates shown below. The $0.36 /kW-month difference of rates shown below are from BPA's response to Data Request Number IR-BPA-3:

Cost Effects of 30 Min w WIT Protocols vs. 45 Min	Persistence in Scheduling	
	30	45
Estimated Rate in $ / kW-mo	$ 1.37	$ 1.73

In general a lower persistence scheduling assumption reinforced by Wind Integration Team ("WIT") proposed protocols reduces the amount of reserves needed to provide wind balancing in turn reducing resultant inputs to further pricing calculations.

Q. *Are there conditions or controls required to ensure the proposed persistence forecasting accuracy levels can be met?*

A. Not yet, but BPA anticipates there will be prior to the FY2010-2011 rate period. (WP-10-E-BPA-22, Page 20, lines 21-25 through Page 22, line 10.) The proposed requirements would permit BPA to instruct wind generators to reduce

output or permit BPA to make other adjustments when total inc or dec reserves decline to critical thresholds. As BPA clarifies on Page 21, WIT reliability and operational requirements can permit the proposed persistence accuracy, reducing required inc reserves.

Q: *Beyond the WIT protocols, are there other mechanisms (scheduled to be in service during the rate period) that are expected to facilitate wind integration?*

A: Yes, sub-regional planning groups, Columbia Grid, Northern Tier Transmission Group and WestConnect have launched a joint initiative to facilitate intra-hour flexibility and dynamic scheduling. Initial protocols, communication platforms and transmission products are expected to be in place and contributing in this calendar year. These are not market tools but rather expediting and support structures for rapid bilateral agreements. As such these tools do not require broad regional planning consensus and can be implemented by BPA rapidly.

Q: *In the discussion above you discuss the proposal of a self-selected thirty or forty-five minute persistence scheduling. If BPA were to adopt only one persistence scheduling level, would you support a thirty-minute persistence schedule?*

A: No. We do not believe all companies are able to implement a thirty-minute persistence accuracy schedule. For some companies, a forty-five minute persistence snap shot best represents their current capabilities. Therefore, to allow for difference in wind-provider capabilities, we recommend that if BPA is willing to base rates on only one level of persistence scheduling accuracy that it base rates on a 45-minute persistence accuracy.

Q: *Have you other concerns about BPA's proposals related to wind integration?*

A: Yes, the term "Intentional Deviation" is used to describe both persistent deviations resultant from system beneficial corrections and intentional

disregard for standards maintaining system reliability. BPA's response to Data Request Number MS-BPA-11, documents that the term "intentional" was defined and utilized in FY 2002. Since that point BPA indicates it has preferred to continue to preserve pre-existing terminology.

Q: If that term has been used for this long and BPA-TS did not assess an Intentional Deviation charge on any customer from October 1, 2007 to March 10, 2009, should this term still be of concern?

A: Yes, intentional is a term that implies deliberate wrongdoing within this context. BPA's substitution of the term "Persistent Deviation" and review of events prior to penalty assessment can remove unintended bias.

Q. Does this conclude your testimony?

A. Yes.