NW Energy Coalition
for a clean and affordable energy future

April 15, 2015

Oregon Public Utility Commission
3930 Fairview Industrial Dr. SE
PO Box 1088
Salem, OR 97308

Re: UM 1622 Workshop on Hedge Value of Demand Side Management

The NW Energy Coalition (Coalition) appreciates the extension of the deadline for comments on the Gas Hedge Value workshop and the related proposal by NW Natural.

In general, we are cautiously supportive of the proposed approach presented by NW Natural, with a view to its temporary nature, additional value to be gained from experience and further review of key issues, and the anticipated comprehensive review of the avoided cost methodology for LDCs in the near future.

The Coalition first proposed the recognition of hedge value for energy efficiency in our initial comments for UM 1622 (filed July 24, 2014). We thank the Commission for directing an inquiry into the potential for this approach in a workshop setting.

Based on the workshop presentation and discussion, we believe that NW Natural, staff and other parties generally agree with the importance of incorporating a gas hedge value in avoided cost calculations. Further, this concept is supported by financial theory and the extensive literature on this topic. In addition to two references provided by NW Natural, we are attaching additional references from the technical literature.

At the same time, we note that there is very little guidance from the literature or regulatory practice elsewhere on specifically how to value the effective hedging by energy efficiency (and other demand side management and renewable energy resources) against future volatility and divergent price trends for natural gas.

NW Natural proposes a straightforward initial formulation:

> *Planning Hedge Value =*
> *Long-term Fixed Financial Hedge Price - EIA gas price forecast*

The advantage of this overall approach is that it is simple and based on readily available price values. However, as noted below, we believe the company's IRP gas price forecast should be used instead of the EIA forecast.

The most significant question is the reliability of the proposed approach to establishing a long-term fixed financial hedge price in representing the true risk of volatility of natural gas prices. All long-term gas price forecasts suffer from poor forecast skill. Conversely, long-term fixed financial hedges are market-based, not model-based. However, indirectly they are likely influenced by the same modeling assumptions and constraints of the EIA and other nationally recognized gas price forecasts.

Option theory suggests that over a reasonable period of time, any superior forecasting approach would be priced into the available hedge and arbitrage would be reduced and perhaps eliminated. However, close examination of the historical price trends over both the short and long run (including when weather normalization is applied) suggests that the models and the markets underestimate both the frequency and magnitude of significant price deviations. As noted above, there may be a hidden correlation between the models and forward markets that creates a persistent underestimation of volatility.

If such an underestimation was not recognized, it is likely that the hedge value of DSM would also be underestimated, exposing consumers to higher costs over time.

In contrast, energy efficiency and other demand resources are now in intermediate to full maturity, and the costs and performance are very predictable over time. While energy efficiency measures have an average lifetime over a decade, the resource is "renewable" with replacements, costs tend to decline (especially in fast-evolving technology sectors), and performance improves through learning (evaluation, training, good practice guidance, etc.). This makes DSM robust over the long run.

On the other hand, gas markets (contract, spot, future, options, hedges) are robust over the short run (up to a year) but have rapidly diminishing liquidity thereafter, so price discovery is much less reliable.

The asymmetry of the risk in the two "asset classes" of future gas and DSM underlies our view that the assessment should not cease with the first step that NW Natural has proposed. However, we underscore that, at this early stage, NW Natural's proposed approach makes for a suitable, temporary first step to incorporate a hedge value for DSM.

As the assessment process goes forward, it may be worth considering the approach proposed by Cadmus (2014) using a scenario based modeling approach to estimate hedge value.

Concerning the questions raised in the NW Natural presentation:

In addition to using the EIA annual gas price forecast, NW Natural proposed two options to create the hedge index: (1) the EIA forecast from the Annual Energy Update and the Henry Hub financial hedge quote; or (2) each LDC's own IRP price forecast and its own hedge quote obtained from a suitable market source.

The Coalition believes that option (2) is better. As indicated, for example, in NW Natural's 2014 IRP, such a forecast should consider not only the EIA but additional recognized forecasts which are also incorporated into other utility planning and operations in addition to the IRP. Second, while the Henry Hub financial hedge quote has the advantage of being public, there may be significant and changing differentials at regional hubs more relevant to Oregon LDCs, such as Opal and Sumas. Even so, it would be useful to include Henry as a comparator. If market-based hedge estimates are used, the sources and values should be filed with the Commission and available for review under protective order.

The second issue raised by NW Natural is extension of a 10-year hedge quote to 20 years. The company proposes using the average growth rate for the 10 years and simply carrying that average forward. The

Coalition could support this at least as a temporary measure, but highlights the shortcoming of using even the available market data for long- term planning and resource valuation.

Going forward, we suggest additional considerations.

First, what gas price risk are we seeking to hedge against? It seems there are two modes: (1) seasonal or short-run risk of very large price deviations caused by external shocks (for example, the California power crisis in 2000-2001 or the extreme volatility of 2008-2009); and (2) longer duration price deviations caused by shifts in major drivers affecting both supply and demand.

This suggests investigating a somewhat more differentiated hedging strategy, since the first category is a risk for spot purchases and the second is a longer term commodity trend risk.

Second, a more fine-grained approach to hedge valuation could involve trending, averaging or scenario analysis to avoid the problem that single-point-in-time price forecasts and hedge values can be affected by temporary short-term conditions.

Third, additional review of trends and drivers may help clarify the potential and limitations of a hedging strategy. On the supply side, shale gas has clearly revitalized natural gas production in North America, but it appears to have a rapid peak-and-decline pattern relative to conventional production at every scale from the well to the basin. As a result, North American production outside the Marcellus-Utica has flattened since 2012.

On the demand side, trend factors are up across all categories: direct use, power production, industrial, vehicles and exports. For example, the EPA's anticipated Clean Power Plan rule will likely significantly increase power plant gas demand for baseload, swing and peaking/balancing alike. Meanwhile, gas exports may pick up very soon: Lithuania recently signed contracts for offtake of gas supplied by the Cheniere LNG export facility as early as mid-2016. RBN Energy (2015) estimates LNG exports just from the "top four" facilities most likely to go into operation in the Gulf Coast area could rise to 6 bcf/d in 2020 and 9 bcf/d in 2025, directly affecting flows and prices at Henry Hub.

To the extent models and markets do not fully account for these potential shifts in major supply and demand drivers, the *forecast – market hedge* formulation could underestimate hedge value significantly going forward. To be sure, there are significant uncertainties for the timing and magnitude of supply and demand drivers; for example, the way that the final Clean Power Plan treats gas redispatch, or the shift in global gas markets toward spot or term pricing and away from oil-linked price regimes in the EU and the the "Japanese Crude Cocktail" that will also affect US LNG export prospects.

Other aspects of DSM hedge value should also be explored. For example, substantial DSM will reduce demand overall and result in what some analysts have referred to as "inverse supply elasticity" or DRIPE:

> The demand reduction in price effect (DRIPE) for natural gas is the reduction in gas commodity prices and capacity & storage costs attributable to a reduction in natural gas consumption. By reducing customer demand in aggregate, gas and electric energy efficiency programs can reduce gas prices to all consumers, regardless of whether they participate in an efficiency program. LBNL (2013:7).

This means that an LDC has more flexibility (both in timing and quantity) for managing commodity purchases that may not be reflected in hedge values from the market as a whole.

Additionally, it should be clarified whether a future hedge index is based on asked or average prices. The bid-ask spread could increase substantially over time and affect the indicative value of DSM compared to the the hedge.

Lastly, NW Natural states in their presentation that "NW Natural views valuation of capacity resource deferrals as a core component of avoided costs that should be directly included and not be part of any hedge value adder." Capacity resources are subject to price uncertainty as well. Consequently, they should be included in consideration of hedge value. If the company does not agree to incorporate them at this stage, there should be an agreement that when the company is prepared to discuss the avoided costs of capacity resource deferrals, the associated uncertainty of that cost will be considered and will be incorporated into the final hedge value.

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Thank you for your consideration of NW Energy Coalition's comments.

Fred Heutte
Senior Policy Associate

CERTIFICATE OF SERVICE

I hereby certify that I have this day caused Comments of NW Energy Coalition to be served by electronic mail to those parties whose email addresses appear on the attached service list, and by First Class Mail, postage prepaid and properly addressed, to those parties on the service list who have not waived paper service from OPUC Docket No. UM 1622.

DATED this 15th day of April, 2015.

Fred Heutte
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NW Energy Coalition
Portland, Oregon