

**Demand Forecast Advisory Committee
Meeting Minutes: May 23, 2013**

Participants: Massoud Jourabchi, Steve Simmons, Ham Nguyen, Vijay Satyal, Alex Walker, Greg Mendonca, Terry Morlan, Bud Tracy, Tom Haymaker, Eugene Rosolie, Bo Downen, Kelcey Brown, Sarah Burczak, Glen Booth, Mark McMullen, Tom Potiowsky, Kevin O'Meara, Adam Rue, Sibyl Geiselman, Cathleen McHugh, Keith Knitter, Jim Sylvester, Tom Payant, Barr Smith, David Clement, Grant Forsyth, Shirley Linstrom.

Massoud Jourabchi called the meeting to order at 10 a.m. He explained that the session was the first meeting of the committee that will advise the Council as it develops a 20-year load forecast for its Seventh Power Plan. The Northwest Power Act requires the Council to prepare the forecast as part of the plan. A draft forecast is scheduled to be released in October, after which there will be a review period. The final forecast will be released in 2014. Jourabchi called attention to the packet of handouts for the meeting, and he urged participants to email comments if they think of things after the meeting. He went over the agenda items and asked for any comments or additions.

Jourabchi explained a slide of the Council's planning process: among the main drivers of the forecasting analytics are economic and demographic data, fuel price forecasts. All of that information feeds into the Council's demand forecasting system. Demand is segmented/developed by customer sectors to get to total electricity use. The Council's demand forecast is a full-blown forecast, not a regression analysis, Jourabchi said.

He said once staff has a demand forecast, it is fed into the Regional Portfolio Model (RPM). Michael Schilmoeller, the model developer, will talk to the committee at some point about the RPM and how he introduces the element of uncertainty into the Council's plan via the modeling. The RPM output provides the least-cost, least-risk resource supply options for the region.

Jourabchi provided a "50,000-foot" level overview of the demand forecast, describing steps that start with an economic forecast and its many components, and end with a "price effect" demand forecast divided by fuel, end use, and state. He said staff tries to go into as much detail as possible for the economic forecast and identify the economic drivers for each Northwest state. Jourabchi went on to explain the retail fuel price forecast and its components. With regard to consumer choice on energy efficiency, the fourth step, he noted that staff syncs up the models with what consumers are actually doing.

In Step 6, staff determines the forecast demand for new capital and simultaneously forecasts the demand for new energy requirements by fuel. The information goes into creating the forecast energy requirements.

Eugene Rosolie asked if staff is relying on conservation forecast estimates from the Sixth Power Plan. Jourabchi Massoud said no and that he gives Tom Eckman information on number of units to develop an estimate of conservation potential. Rosolie asked if the Council uses ramp rates for certain efficiency measures based on when new codes and standards go into effect. Jourabchi said no, but that he does a forecast of how effective a standard would be for energy savings. If we see that people are going to exceed the standard, we know it is the floor, he said.

Keith Knitter clarified that Council staff develops a forecast based on economic inputs and codes, etc., and then calibrate it to what the actual loads have been. Jourabchi said that is correct. He referred to a step on the slide in which he introduces additional information to

compare to the forecast. We bring in a lot of information to make sure the model trajectory makes sense, Jourabchi said. After this step, he said he produces a “price effect” forecast by fuel, end use, and state.

Terry Morlan clarified that the price effect forecast is what demand would be given existing policies and price expectations.

The advisory committee participants asked several clarifying questions, including the source of the weather history, which is 80 years of degree-day data, and whether the analysis is run for each climate zone. Jourabchi said the model is run for each state, not for the climate zones. He said space heating data is used to distinguish different zones in a state. There was also a question about how the model treats state-of-the-art versus prospective efficiency measures. If a measure is on the shelf, we recognize it, Jourabchi said.

Economic Drivers

Jourabchi listed economic drivers of the forecast: existing homes; new homes; stock of square footage in 17 commercial building types; new commercial square footage requirements; production levels for industry, agriculture and mining; and income in the residential sector. Global Insights and in-house analyses are key sources of information. The vintage of the data is Q1 2013 and Q4 2012. Jourabchi said consumption is adjusted if income in the residential sector drops; if income drops, there would be pressure on demand.

Vijay Satyal asked why mobile homes were excluded from the count of homes. Jourabchi said there is a big difference between the number of manufactured homes and the number of mobile homes. Bo Downen asked if there are sensitivities built into the analysis of the economic drivers. In other words, do some have more impact than others? he asked.

Jourabchi said sensitivities are not built in and it is not part of the work plan to establish which driver has the largest impact. Ham Nguyen said weather always has the most impact on consumption year to year.

Rosolie asked about the square footage used for new homes. Jourabchi said in looking for reasons to explain the difference in consumption from home to home, square footage made a difference. We now compare the space heating requirements at the square footage level, he said. He noted the Residential Building Stock Assessment (RBSA) is providing good information and a Commercial Building Stock Assessment (CBSA) will also aid the demand forecasting work.

Jourabchi said the largest driver of demand is population. According to the Slide 6 table, population in all four states and the region is expected to grow at a slower pace than in the previous 30 years. The projection is in line with expectations for the United States as a whole. The overall estimate is growth of 0.9 percent or 136,000 residents annually. Jourabchi broke the projections down by age groups. The growing sector is people 65 years and older; the under 20 population is declining as a percent of the total. The fastest growth rate is in people 85 years and older. The change in demographics means consumption patterns will be quite a bit different, with health care and elder care more in demand, he explained.

Mike McMullen said the pace of growth presented on the slides is in sync with what he is seeing. Jim Sylvester said the numbers are in the ballpark. I have no problem with the numbers for Montana, he said.

Jourabchi moved on to a slide of the ratio of workforce to elderly population. Back in the 1980s, there were over five people working for every one elderly, but if projections hold, we will have less than three by 2030. This change indicates the pressure there will be on resources. How can we meet the needs for eldercare with fewer working-age people to support it? he asked

Satyal pointed out that if the figures are potential employable versus actual employed, the workforce number could get smaller. He asked if the graph assumes everyone over 65 is not working. Jourabchi said that is the assumption. There was a comment that the graph needs to reflect change in two-year increments rather than the larger intervals presented after 2010.

Jourabchi summarized that the graph raises the issue of what is happening with demographics and what the impact will be. Rosolie asked if there is an assumption on the outmigration of retirees from the region and whether the rate stays the same over time. Jourabchi said he would pose the question to Global Insights.

Tom Haymaker questioned why climate change would bring more population to the region. It could bring less, he said, if the measures taken to mitigate climate alter the economy and drive up fuel prices. This would take away the region's advantage with low electricity prices, he said.

I don't see this as sustainable, Sibyl Geiselman said in reference to the ratio of workforce graph. People will stay in the workforce longer; this trend doesn't seem systematically sustainable, she said. There was a comment that the ratio will change when changes are made to Social Security benefits.

Sylvester said immigration could change the ratio. A lot of economists are looking at immigration as a way to address the demographic issue, he said. Nguyen agreed. He said the millennial echo (those born past 200) will be huge and could have a big impact in 20 years.

McMullen said in general, he is seeing the same pattern with the elderly to workforce ratio; it is more pronounced in rural areas and less pronounced in the Portland area. He said he is not sure of the impact of retirement on loads. Consumption patterns are also changing; this could be the first decade in which consumption does not grow faster than the economy, McMullen said. With baby boomers, consumption led the way. We are expecting lower growth in consumption, which has implications for the industrial structure, he said.

Jourabchi said he could try to capture the changes by putting slight trends into the forecast.

Slide 10 shows the regional growth in residential building stock. Jourabchi said there is a trend toward fewer people per household. He said population is expected to grow .9 percent with housing stock growing faster at 1.2 percent. The RBSA will provide better information on the number of people per household, he added.

We need more information on high-rise buildings, those five or more stories, Jourabchi said. We have information from Seattle City Light about the percent of increase in high-rise buildings, and we are trying to get similar information from the City of Portland. We think there will be more multifamily additions in the form of high-rise apartments, particularly in urban areas, he said. Jourabchi pointed out there are differences in the construction materials used in high-rise buildings compared to lower-rise buildings.

Sylvester said the Montana building stock numbers are too high. The increase in multifamily is way too high and is more likely to be close to the historic level of 1.6 percent, he said.

Morlan asked about the drop-off in manufactured housing. Jourabchi said he has seen a continuous drop in manufactured homes on permanent sites. He said the information comes from tracking shipments of homes to the Northwest states, noting it is difficult to track homes versus single units used for commercial or mining sites. The attempt is to track units put on permanent sites, and there has been a drop in actual shipments. Manufactured home occupants are typically the single elderly or newlyweds, he said. In the 1990s, there was a change in lending practices that led to manufactured homes being less desirable from a bank's point of view; they are considered a depreciating asset, not an investment, Jourabchi said.

Nguyen said there is a difference between a manufactured home on an owner's land and one installed in a park. Jourabchi agreed. Over 50 percent of these homes are in parks, and land for the parks is getting scarce; that is one reason for the decline, he said. A participant pointed out that even if the estimates are wrong in this area, it won't have a big effect on the forecast.

Jourabchi said the RBSA is showing that while manufactured homes are small in number, they use more energy per square foot. If we can influence this sector and get newer manufactured homes, we would see savings. But in terms of electricity load in the region, it isn't a big number, he said.

Slide 11 shows there was a large increase in single family units from 2002 to 2007 but a decline in 2008 to 2011, Jourabchi pointed out. In 2012-2035, we are moving to a more sustainable level, he said. Nguyen said looking back further than 1985, there was a housing bust, so there are cycles.

Rosolie asked about the numbers on Slide 11 for Oregon's single family additions and there was a suggestion some of the numbers on the slide might be reversed. Jourabchi said he would double-check the numbers.

Geiselman suggested if occupancy in homes is declining, the per household energy use might also decline. Jourabchi said that is hard to judge. We will try to reflect it, but consumption patterns vary by household, and it is hard to track all of the variables that affect it, he said.

Jourabchi noted that Slide 18 shows growth in the commercial building sector slowing down. For the commercial sector, we look at square footage in use, he explained.

Going back to the residential sector, we think manufactured housing will be depressed and multifamily will increase, Jourabchi said. He asked if the single family numbers seem reasonable. We are going back to more historic levels before "the bubble," Jourabchi said.

In the past we were more pessimistic than Global Insights about the turnaround, but we are now closer, McMullen said, adding that Oregon does not have the peak as high as Global Insights. We are pretty close to the Global Insights outlook for the first time in several years, he said.

Rosolie asked about the forecast for square footage in new houses. Does it go up or is it steady? he asked. Jourabchi said he is tending to stay with historic levels. That is a safe assumption, Nguyen agreed, although the "McMansions" in the 1990s proved us wrong about growth in smaller homes and multifamily housing.

Moving to Slides 15 and 16, Jourabchi pointed out that what we are seeing in the region is not far off from what is going on nationally. We are seeing the same trends in the composition of housing stock, he said.

On Slide 18, Jourabchi pointed out that the forecast is for a downturn in commercial sector employment, which drives the space requirement in that sector. We track about 4,000 activities for the forecast and assign building types to them, he explained. For example, a financial firm goes into a Class A large office building. We then try to make the connection between business activity and building, estimating the floor space requirement for 17 different commercial building types, Jourabchi said. We track additions to floor space and create a stock of building types. He noted the CBSA will help refresh the numbers to get the forecast closer to the actuals.

Bud Tracy asked if the Council tracks the relationship of employment to the residential side, tying income to residential housing. Jourabchi said he hadn't looked at that. Tracy said it would indicate the availability of funds to pay a mortgage and answer the question of whether people can afford homes in the future.

Task: Jourabchi said he would take a look at data on the effect of employment on mortgage payments and rents. Nguyen pointed out an index of affordability would show the interplay of those factors.

Slide 19 shows the current forecast of floor space required for the commercial sector. From 1985 to 2011, we were adding 52 million square feet of commercial space annually, Jourabchi said. Closer to the recession, we were adding more than that, he added. But as result of the corrections in the market, we will return to a lower level of additions, Jourabchi said. He asked what the committee thinks of the numbers for the commercial sector slowdown.

We are saying with these numbers that consumption won't drive the economy in the way it has in the past, Morlan said. Will investment be the driver instead and what effect does that have, he added.

That may be the case, but we are entering a slowdown, Tom Potiowsky said. Even if there is substitution of economic activities, it won't be at the previous level, he said.

There were several questions about the volatility in the commercial forecast for floor space additions. Jourabchi responded that the components in each sector have their own characteristics and some sectors show more variation than others. You might question the timing, but some cycles are likely, Morlan added. The peaks are lower than in the historical forecasts, and loads are more like they were historically, he said.

Jourabchi explained that in the commercial sector, the mix of uses is changing. We are moving from the need for retail to the need for warehouse space, he said. The interplay of these changes in the mix lead to changes in the space requirements, Jourabchi said. Nguyen pointed out there has been an increase in leisure and hospitality industries. There are lots of people, but not a lot of square footage is needed, which helps explain the decline, he said.

Kelcey Brown asked if demand data from utilities comes with explanations of how they classify commercial versus industrial load. Jourabchi said it did not. Brown said it is hard to correlate use at her utility with others because of the differences in the way utilities classify commercial and industrial load.

Jourabchi explained that he uses data utilities provide to PNUCC to compare overall growth rates but uses other means to distinguish types of businesses. Nguyen said PGE customer Intel has most of its facilities in manufacturing, but a portion in offices. For the forecast, would you pull the office area out and call it commercial? he asked. Jourabchi said he would. Nguyen said PGE calls all of Intel's load manufacturing. There are differences in the way utilities classify sectors, he said, adding that some make a distinction by voltage level. Nguyen commented that there wouldn't be a lot of commercial square footage added until unemployment recovers.

Jourabchi asked if the committee is comfortable with the rate of commercial square footage additions forecast to start in 2016. Nguyen said the numbers agree with what the state forecasts show.

Tracy said the point about classifications, commercial versus industrial, is a valuable one. There is such a broad range of characterizations, it is important to know what is considered part of a sector in order to be consistent, he said.

Slide 23 depicts manufacturing employment and indicates that beginning in 2012, it is picking up but does not return to the high levels of the 1990s, Jourabchi said. He noted there are a couple of manufacturing sectors, like furniture, that are behaving oddly and that food processing seems to be growing and lumber declining. Nguyen noted the manufacturing forecast was based on output rather than employment.

Sylvester said he does not see lumber declining, commenting that Montana has some of the only mills left in the region. Paper and aluminum should be zero for the state, he said. For Montana, fabricated metals should be 5 percent, and transporting goods will also need to change, he said, adding that he would send new Montana numbers.

For aluminum, Jourabchi said he substitutes BPA's forecast. We don't expect Columbia Falls to come back, he added.

Task: Satyal asked about what is included in the electric equipment category and Jourabchi said he would send the NIC classifications.

Rosolie said he is not comfortable with 2 percent per year growth with the paper industry. Employment should be steady, he said. With implementing energy efficiency, the industrial output is increasing, but load is not, Rosolie said.

We were driving the industrial with employment and productivity, but now, we are driving it constant dollar sales, Jourabchi clarified.

Nguyen cautioned about forecasting based solely on employment or output. If you forecast based on high-tech employment, you will be way off, and if you forecast based on the humongous growth in output in Oregon, you will also be wrong, he said. There are pluses and minuses of each, he said. Electricity consumption tied to an industrial process can be steady, but the employment numbers can change, Nguyen said.

You have to build in productivity growth over the long run, McMullen said. It is flat now, but there has been less investment in research and development in recent years, he said. Going forward, there would be more investment, McMullen said. Satyal asked about the feedback effects of conservation. Does that influence the output side? he asked. Jourabchi said there is

an attempt to calibrate the effect, but it is hard to capture. It is hit and miss but is an area where we hope to make adjustments, he said.

With regard to employment, we saw a strong correlation in the past between electricity use and employment, Brown said. But now as employment picks up, we are not seeing electricity use increase, she said. If you use that measure, you will over forecast electricity use, Brown added. I would caution you about using too much history as a basis, she said. We had a significant drop in energy use, but as we see an increase in employment, we don't see an increase in electricity use, Brown clarified.

There has been a huge investment in energy efficiency during the recession, Rosolie commented. It is one way companies can cut costs to remain open and competitive, he said. Output can increase, employment may increase, but energy use isn't increasing, Rosolie stated.

Brown suggested there could also be new types of industries that are replacing older more electricity intensive industries.

The model is relying on historical patterns, but are we seeing a structural change, a change in the makeup of the commercial and industrial base, Satyal commented. It would be useful to know how much of the change is structural and how much the recession has changed things in order to avoid over forecasting, he said.

The industrial sector is hard to forecast, Jourabchi stated. There are large chunky loads and they are influenced by the global economy, he said.

Nguyen pointed out the potential for big unforeseen changes. We have an oil and gas glut, but who would have thought that, he said.

Morlan suggested the importance of uncertainty analysis. For electricity consumption, some key substitutions show the uncertainty at the industry level, he said.

We are seeing realignment as a result of rate pressure, Geiselman said. People are making systematic changes in the way they consume, she said. We are not seeing the rebound of consumption with more employment, but is it a price elasticity or employment issue? Geiselman asked.

Once I adjusted the forecast for weather and inflation, we were in the low to medium range of growth forecast for the Sixth Power Plan, Jourabchi said. The growth is not there, he stated.

Following a lunch break, the committee resumed the industrial sector discussion. Rosolie asked why the Council doesn't use the utilities' industrial forecasts. The large industrial customers are pretty unique, and any "peanut buttering" of assumptions over that group of customers is going to be off, he said. Jourabchi said confidentiality is an issue with gathering utility forecasts. He asked if utilities would be willing to share their industrial forecasts. Brown said PacifiCorp would not provide its forecasts.

It might be worth doing as "a gut check" on a macro level to see if you are in the ballpark with people who are closest to these customers, Haymaker commented. If there is a 20 percent difference, it would be worth discussing, he added.

The Council compares its forecast with PNUCC and some utilities at the load level without any sector detail, Morlan said.

Slide 27 shows that agriculture and forestry is a growing sector and the growth is expected to continue, Jourabchi said. This sector is expected to grow in part due to demand from the European and Chinese markets, he said.

Potiowsky said mill output has been going up, but the capacity has declined. The bump-up has been in raw logs rather than processed wood products, he said, adding that the sector could be growing faster than Global Insights indicates.

Tracy suggested disaggregating agriculture and forestry. On the demand side, the agriculture load is irrigation, Morlan stated.

Knitter clarified that the figures do not include food processing. Jourabchi said food processing is included in the industrial sector and that demand in the frozen food industry will go up. There were other questions about what the agriculture and forestry category includes. We heard at the Pacific Northwest Regional Economic Conference that agriculture is growing faster than reflected here, so we need to work on this area, Jourabchi stated.

Rosolie asked why the agriculture and forestry sectors are going down in Idaho. Tracy said it could be a product of the water supply. Agriculture in Idaho is largely irrigated and water is not available, he said.

Data Center Load

Jourabchi pointed out that data centers are tracked separately from other loads. He described two categories into which the data centers fall, hidden data centers and custom data centers. Hidden data centers are such things as server closets and rooms in businesses, and custom data centers are the large Yahoo and Google installations. The enterprise level data centers want to be in non-metro areas and often locate in public utility service territories, Jourabchi said. The mid-tier data centers are in urban areas near their clients, he said.

The Northwest has a disproportionate share of data centers due to several factors, including cost, cheap power, weather, and tax policies, Jourabchi said. In January 2008, there were 15 average MW of data center load, with a 25 MW peak demand, and by 2011, there were 51 aMW of data center load, with a 61 MW peak, said. He asked utilities to provide information on the data centers in their area. I could use more information about these data center loads, Jourabchi said. He noted that data storage and processing efficiency is increasing exponentially.

There were questions about the source of the information on data centers presented on Slide 32. Jourabchi said it came from national sources, and it seemed the region was representative of the national picture.

Geiselman said EWEB had potential data center customers and looked into how the additional load would impact its BPA tiered rates contract. We looked at what portion of the load would be subject to Tier 2 and the effect of the Oregon Resource Portfolio Standards (RPS), she said. Many full requirements customers of BPA are facing the new large single load requirement and the RPS; if they double their load, they are pushed into compliance mode, she said. There can be a conflict between what a city thinks about in creating an enterprise zone and what a utility

thinks about in terms of gaining a large new load, Geiselman stated. Greg Mendonca agreed that adding data center loads is an issue for utilities.

It is one thing to get a handle on what is there now, but for the forecast, you need to see the trends, Morlan said. If cloud storage continues, for example, there will be less of the smaller-scale data storage, and what would be the net effect of that? he asked.

We assume that large data centers have a large incentive to do efficiency improvements, Jourabchi said. They are becoming more open about their operations, he added. The assumption we made is that growth would be 6 to 7 percent, he said. The data centers may have an incentive to be more efficient and there is a trend toward lower-consuming devices. Jourabchi said.

Mendonca said a lot of data centers want to ensure capacity and don't deal as much with energy. We are interested in their efficiencies and their efficiency gains, he said. The load could start to go down as efficiencies go up, Mendonca said.

Knitter said there are several data centers in the Grant PUD service territory, a couple of which have built out much more than what they are currently using. They are building-in redundancy, he said. You might have 150 MW of potential load that is being used at 70 MW, but it could go up very quickly, Knitter added.

If you want to share information on data centers, we will sign non-disclosure agreements, Jourabchi offered.

Slide 35 addressed transportation, and Jourabchi said he wanted to get a feel for the factors that drive change in this sector. Nguyen said the WSJ had an interesting piece recently on electric vehicles (EVs) that addressed the role of incentives and operating costs. You see the potential for electric cars; consumers will overcome anxiety about their limited range, he said.

Jourabchi noted that as of January 2013, there were 4,700 electric vehicles in the four Northwest states, with the bulk in Washington's urban areas. Electric vehicles represent a growing market and there is quite a bit of residential load associated with charging, Jourabchi said. While most of the charging is happening in residences at night, the number of charging stations is increasing, he said. Jourabchi said EV charging can increase a household load by 22 percent, with average consumption at about 12 MWh per year and households with EVs at 15 MWh. Our expectation is that most charging will happen at night, he said.

The efficiency of EV batteries is improving and not all vehicles are charged every day, Jourabchi said. He gave estimates of the expected impact of EVs on peak load, with a low case of 5 MW and a high case of over 20 MW by 2035. The variables are income, price of technology, and fuel costs, Jourabchi said.

Rosolie asked what the forecast is for how long EV subsidies will continue. We expect incentives to continue for a few more years, Jourabchi said.

Nguyen said three things are happening with EVs: a critical mass brings the cost down; some states have very aggressive emission mandates; and there is a new source of lithium in the United States. With the new source, we wouldn't have to import lithium for batteries; it could be mined and manufactured here, he said.

McMullen said he works with a group that addresses apportioning the costs of the highway system. The AAA participants don't believe EVs will ever make much headway in terms of market penetration since hybrids are getting better and better, he said. They see the future more in terms of hybrids, McMullen said. I don't know the implications for electricity load of that distinction, he said.

Data: McMullen said he would send a study that addresses changing the way funds are raised for highway costs from a gasoline to a mileage tax.

It doesn't appear EVs will be a big factor in aggregate load, although for some utilities, like Seattle City Light, it might be, Jourabchi said.

Geiselman raised a point about whether the EV subsidy will disappear in two years. Wind and solar have been subsidized for a number of years and the subsidies continue. she said.

Given the data we have, it appears most EV impact will be at night, which is welcome news for utilities that have lost off-peak loads, Jourabchi said. Charging should lift off-peak loads in the future, he added.

Jourabchi asked for thoughts on natural gas vehicles, noting he does not expect them to be a big player. None of the car manufacturers think natural gas will make any headway because of cost, Nguyen said.

Wholesale and Retail Fuel Price

Jourabchi described how the Council forecasts the wholesale price of electricity. It is more complicated to come up with the retail price, he added. For natural gas, Slide 46 shows the relationship between Henry Hub and retail prices; it is not unusual to use Henry Hub prices to come up with a retail natural gas rate, Jourabchi said.

He proposed three possible methods to arrive at the retail electricity price, described in Slides 47, 48, and 49. Method 1 starts with 2012 retail rates by sector and state, which are then adjusted. Method 2 uses the RPM results from the Sixth Power Plan.

Morlan asked why Method 2 uses a no conservation case. The results will indicate what the price would be in the future if there was not a conservation program, Jourabchi said.

Method 3 would use the competitive relationship between natural gas and electricity to forecast retail rates. We don't have to be exact with the projected prices as long as gas and electricity are in sync, Jourabchi said. Slide 50 shows the historic ratio of retail electricity to natural gas price. The fuels have to compete with each other and this indicates their relative competitive position, he said.

Morlan said he did not like that approach since regulators set the prices. There isn't retail level competition, he stated. Morlan said he preferred the RPM approach.

Mendonca said Method 1 would not work for BPA customers. When Mid-C prices are dropping, BPA rates increase, he said. The relationship here would not work for the BPA customers, Mendonca said. The market forecast in the latest BPA rate case is lower than BPA's preference rate, Mendonca said. When Mid-C prices dump, it doesn't mean BPA's prices reflect it, he said.

The committee discussed the proposed methods. Steve Simmons pointed out that there is a pretty strong correlation between Mid-C and Henry Hub prices.

Haymaker questioned whether the wholesale price of gas or electricity has a long-term impact on the retail price; they are two different markets. Power is a daily traded commodity and the retail price is based on many vagaries, he said. There are fixed costs that have to be covered in retail rates and the model used has to cover that component, Haymaker indicated.

Brown said low wholesale prices have differing effects on utilities. That is the problem with Method 1, she said.

Jourabchi said he had the sense Method 1 is not supportable, and using Method 2 and the RPM model is preferable. I don't see much difference between Methods 1 and 2, Morlan said. They just use different models to get to the wholesale rate, he said, adding that how well Aurora does on developing wholesale rates is an empirical question.

Method 1 could work in some years, but in others, it will give a false forecast, Mendonca said. Method 2 may work better, but it isn't clear until we see the rates, he added.

Jourabchi said he could make a comparison when he has the information to run Method 1.

Haymaker raised the issue of fixed versus variable costs and the role of each in rates. Have you thought about breaking them out separately and considering how they affect consumer behavior? he asked. We could have negative load growth, but our costs and rates go up; people do not get the right price signal, he said. Jourabchi said the issue deserves more discussion in the Council's Seventh Power Plan.

Certain areas in the region do not have access to natural gas, Rosolie pointed out. How is that taken into account? he asked. Jourabchi said the forecast work is conducted at the state level and is not site specific.

Nguyen asked about the treatment of capital costs and the discount rate. We create a weighted-average discount rate based on regional loads, Jourabchi said. The cost of capital is based on data from Global Insights, and we assume different capital structures for IOUs and for publics, he explained.

With regard to retail prices, the question we have contemplated is whether retail prices are a driver of electricity use or is electricity use a driver of retail rates, Brown said. As your load decreases, fixed costs remain and your load can drive your retail rates, she said. The question is whether this is an appropriate driver, Brown said. We don't use prices at all because of the historical relationship of prices to loads, she said. It is not a good driver because it is not independent, it is dependent, Brown stated.

Tom Payant said Snohomish uses the inflation rate to forecast expected retail price and indexes incomes. Those are important to our forecast, he said.

The committee discussed how to adjust for the effect of price on demand, and Jourabchi said the committee would need to revisit the issue.

Simmons explained the approach to the cost of carbon on Slide 54. He described the CO₂ regulatory forecasts run for the electricity price forecast in the mid-term assessment of the Sixth

Power Plan and how cost curves were developed for economic damages and social costs. Knitter asked how social costs factor into electricity prices. It affects the wholesale price, Simmons said.

He explained a graph of the wholesale price forecast at Mid-C and the effects of CO₂ actions. You can see where the CO₂ tax starts jumping and the effects on price, Simmons said.

Geiselman asked how the CO₂ scenarios flow into the rest of the modeling. Jourabchi said there is a coefficient for every resource to determine how much the CO₂ adder is for the resource. There will be four different scenarios, one for each sector, in the forecast to incorporate CO₂ costs, he said. Right now, we would add in the costs in dollars per ton to every sector, Jourabchi explained.

Potiowsky asked if the carbon tax is based on power that is generated in the Northwest. Simmons said the model runs the entire WECC area so it applies to any U.S. sourced power that emits CO₂. Coal plant retirements will lower the CO₂, he said.

This has a feedback effect into EV penetration, Potiowsky commented.

Rosolie asked how the social costs are incorporated. How are they picked up by consumers if they are not included in the cost of the resource? he asked. Simmons said the social costs are modeled as a tax. There were additional questions about incorporating the social costs.

Data: Potiowsky offered to send a research report in which the costs are reflected using a BC-type tax.

Jourabchi asked if utilities include a CO₂ tax in their forecasts. It is a legitimate scenario, Nguyen responded. Geiselman said EWEB didn't make decisions based on the tax in its last IRP since it is so uncertain.

Potiowsky said there will be bill from the Oregon legislature that proposes studying a carbon tax. It could create revenue and that is the driver, he said.

We don't look at it in particular, Haymaker said. From a resource perspective, there aren't lots of alternatives, he added. If gas meets our resource needs, a CO₂ tax doesn't make a lot of difference, Haymaker said. Rosolie said Cowlitz doesn't include it explicitly. Brown said PacifiCorp is required by the Oregon PUC to include CO₂ tax projections in its forecasts.

Expected Growth Rates

Jourabchi presented a comparison of the growth rate by sector from the Sixth Power Plan and the draft Seventh Plan. Overall, the load trajectory is low, he said. A load forecast starts the power plan process, Jourabchi added. The 2011 actuals show we are in a low to medium load trajectory, he stated. In a month or so, Jourabchi said he would have actual data for 2012 and another point to compare. He moved on to the mid-term assessment forecast, saying, we don't expect a full recovery until 2018-2019. In the Sixth Power Plan, we didn't have all of the efficiency standards that will keep loads down, Jourabchi added. We are in a low trajectory for load growth, but in 2030, we could be back to historical level, he stated.

Payant said Snohomish isn't expecting much industrial growth and not more than commercial or residential. Brown said PacifiCorp is not seeing the level of growth in the draft, particularly in the residential sector. Jourabchi asked the committee to submit their comments about the growth rates in the draft.

Mendonca commented that the mid-term assessment for the Sixth Plan has a higher growth rate than the plan. Are you expecting greater growth? he asked.

I think you will want to calibrate with the state's forecast; it is more reliable and they know the local aspect better, Nguyen said.

Data: Potiowsky suggested following the work of the Washington Forecast Council, Idaho Department of Finance, and the Oregon Office of Economic Analysis. He suggested checking IHS data against what the states provide.

Should we expand the range of economic drivers on Slide 61? Jourabchi asked.

The residential stock and units are tied to population, and the range there is not as wide as with industrial shifts, Morlan said. The range with residential shows a larger uncertainty than in other sectors, so I would narrow it, he said.

Nguyen said he agreed. The industrial range could be broader; there is potential for a more optimistic view, he added. We are starting so low and one paper plant can make a lot of difference, Nguyen said.

Brown said she takes a different approach without a set range and scales the Global Insight forecast to PacifiCorp's states. For industrial growth, we allow for more variability, she said.

Demand Forecast and Conservation Interface

Jourabchi explained the relationship between the demand forecast and the frozen effect forecast, which is used for the conservation potential assessment model. Once we go through all of the analysis, we come up with optimum conservation targets, optimum in that they create optimum cost for ratepayers and the least risk, he said. Jourabchi explained the development of the conservation targets, the conservation potential assessment, the lost opportunity and retrofit amounts, and the ramp rates to get to the overall potential.

Nguyen said he has a problem with considering some conservation as lost opportunity. It can be regained later; it isn't lost forever, he said.

The committee discussed lost opportunity and technical versus achievable conservation potential.

Jourabchi said he included the last section to show that conservation and the load forecast need to work together. On Slide 64, he indicated that the demand forecast and conservation resource estimates have a common baseline for the number of new units added and the end-use characteristics. Changes in the demand forecast change the conservation resource potential, he said. If a sector is in decline, the load forecasters need to know it and the conservation folks need to know, Jourabchi said.

Brown said she works closely with the DSM group at PacifiCorp to make sure the load forecast is accounted for in the study of conservation potential.

Geiselman said EWEB is pausing its conservation program and considering how to address peak through the program since the utility doesn't need energy. We are looking at the reasons to do conservation, she said. We are doing a thorough program evaluation to find the best approach going forward when there are not incentives from a clearly economic standpoint, Geiselman stated.

Jourabchi asked the committee members to provide comments on the draft forecast in June. He went over a tentative schedule for the forecast, which should be final by Q3 2014. The Council's draft Seventh Power Plan is scheduled to be out in Q1 2015 and finalized by Q3 2015, Jourabchi reported.

He presented a tentative agenda for the next advisory committee meeting, which he said would likely be in September.

Tracy said it would help the region if the Council would provide more explanation with the draft plan for people to see how it got "from A to B." Try to put together a plan that shows how we track through these issues, he suggested.

Brown suggested including lighting on the next agenda and a discussion of end-use impacts. The CFL penetration was less than expected so we could discuss what the assumptions are going to be for them, she said.

We found there are lots of CFLs in houses, but they are in the closet and not in use, Jourabchi said. This is an area where the load forecast and conservation potential need to be in sync, he added.

The meeting adjourned at 3:35 p.m.

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