**5th External TAG Meeting**

**Date & time:** 10/14/2016, 09:00 AM – 10:30 PM

**Location:** WebEx from Kennewick GO

**Presenters:** Mark Sellers-Vaughn, Brian Robertson & Devin McGreal

**In attendance**: Mark Sellers-Vaughn, Brian Robertson, Devin McGreal, Carolyn Stone, Mike Parvinen, Mike Clapp & Jennifer Gross.

**Called in**: Bob Morman, Garret Senger, Eric Wood, Laura Flanders - NWP, Mark Chiles, Tom Pardee – Avista, Ed Finklea - NWIGU, Amanda Sargent, Sheila McElhinney, Kary Burin, Kathi Scanlan, Chris McGuire, Monica Cowlishaw & Bruce Folsom.

**Minutes by**: Carolyn P Stone

Mark began the meeting by welcoming everyone. Mark then had Brian Robertson show the exits for safety purposes to those attendees at Kennewick GO.

Mark announced that the meeting would last about 90 minutes and asked everyone for any opening remarks. Garret Senger stated that there has been unbelievable work to get this IRP out in such a short time span and thanks the IRP team. Bob Morman stated that this was a monumental task and also thanks for CNG crew. Both were looking forward to today’s presentation.

Mark went over the meeting agenda:

In today’s meeting we will state what the deliverable is for Monday in regards to the draft and stated they may need to clarify a few things with regards to the deterministic & Monte Carlo model runs. Mark ends by asking those on the phone to identify themselves before they speak.

*Presentation #1* – Devin McGreal

**Current Resources**

* Devin started out by stating that “current resources” are the resources used in the model runs as well as those resources that are NOT being used and why.
* Slide #4 - Devin explained the types of supplies:
  + Base – fixed supplies we must take.
  + Winter Supply – Must be taken in winter only.
  + Day Gas – Used on peak days and the most costly supply.
* Slide #5 – Shows the Key Elements matrix. Devin reminds that the elements highlighted in red are excluded resources.
* Slide #7 – Most incremental transport begins in November of 2017.
* Slide #8 – Mark went over the resources shown in red & explanations why not in used in model:
  + **T-South-So Crossing** – Crosses south of BC & Alberta…Alberta to Sumas, this requires expansion to NWP and shows no significant advantage to CNG. There is some potential in the future for this resource.
  + **Trail Max/N-Max** – This goes from Opal using GTN from Madras to Malallo. Mark explained CNG would need additional transport, so this option doesn’t benefit us.
  + **Pacific Connector** – This is associated with the Jordan Cove project. Goes from Malin to NWP at Grant’s Pass. There has been opposition to the project, but it’s not a done deal yet. This is a supply resource possibility in the future.
  + **Ryckman Creek Storage –** Requires incremental capacity at Ruby. There are reliability issues including accidents and financial issues. Even the cost is prohibitive due to transport upstream and downstream in Oregon.
  + **Gill Ranch Storage** – This storage is in California and would require transport on California’s system. The cost from California to Malin would be high.
  + **Mist Storage** – This is used primarily for PGE. There is no supply available that is cost effective for CNG.
  + **AECO Hub Storage –** This goes from NOVA to GTN. It is a good price but is constrained and flow subject to interruption. Firm OUT only, non-firm IN.
* Slide #9 is an “expansions” graph, showing the path for each resource mentioned above.
* Slide #10 shows how the incremental transport looks in Sendout.
* Slide #11 discusses modeling of incremental storage.
  + Incremental transport cheaper than picking up additional storage

Question: Kathi Scanlan asked if Cascade is going to provide descriptions of these resource not modelled for the IRP filing.

Answer: Mark said “yes”.

* Slide #13 – All in Scenario includes the Yakima LNG satellite facility & OPAL incremental supply.
  + It does not include BioNatural Gas, as there is nothing available to the CORE at this time. We talked about ALL scenarios.
* Slide #15 – “Impact Slide” showing our system modeled. Mark said he has been told that this scenario is one of the most complicated to try.
* Slide #16 – Expected Scenario removes the resources SENDOUT does not like. This rank orders the scenario to see if the expected IS the lowest cost option!
* Slide #18 shows the 5 scenarios ranked.
  + Mark mentioned that we they removed fixed costs, the Average cost went down. The Expected Case is the lowest cost scenario realizing that Sendout has perfect information.

Question: Ed Finklea asked if the average cost includes commodity.

Answer: Yes. This is the “All In” cost to the CityGate.

Slide #19 – Alternative Resources Selected:

Question: Carolyn Stone asked when you say that the model “doesn’t take” the resource, what exactly does that mean?

Answer: Devin said the model selects resources as to what it considers optimal. If the model doesn’t use the resource in its results then it doesn’t consider that optimal.

* Slide #20 - Sendout “likes” the Yakima LNG Satellite plant
* Slide #21 & 22 – Alternative Resources NOT Selected, OPAL incremental was not used.

*Presentation #2* – Brian Robertson

**Monte Carlo (MC) Simulations**

Brian explains that the Monte Carlo simulations use expected weather and expected growth as stress tests on the Sendout model results.

* Slide #25 shows the MC annual Price at 200 draws using Nymex
* Slide #26 shows the total system cost with expected customer growth. The Standard Deviation (STD) varies more here than with weather.

Question: Ed Finklea asked if the IRP group is stating that there is more price uncertainty than weather uncertainty.

Answer: Mark answered “yes essentially”!

* Slide #27 – Historical weather data is used with the same assumptions for extreme weather
* Slide #30 – Every historical months HDD was compiled into 30 data points for every weather station, which follows closely to a normal distribution!
* Slide #31 – HDD results using 200 draws
* Slide #32 – Demand Forecast – note the low demand for year 2031.
* Slide #33 - The mean is close to the “deterministic” model’s mean.
* Slide #34 - Monte Carlo Price & Weather at the same time would take 40,000 draws to calculate, which would take 100 days to run the model….
* Slide #35 – Shows the Resource Mix (R-Mix) decision for storage – None of these options taken!
* Slide #37 – Shows the Peak Day supply taken vs demand. Shows each demand increment and what resource is used to provide supply.
* Slide #38 – Total System Cost (TSC) by year
  + The yellow line is the max
  + Grey line is the MC average
  + Light Blue is the deterministic run
* Slide #39 – Price comparison with a Carbon Adder
  + The Orange line is the Expected mid-price
  + Taken from a 20 year price forecast
  + Using an average of 200 runs

*Presentation #3* – Mark Sellers-Vaughn

**Action Plan**

Mark went over Slide #40, Action Plan

Question: Which case will be at in the Monday draft?

Answer: In general we will grow into the resources. In 2021 for example the scenario shows that we are 17K Dth short at Bend, Wenatchee short 5,800 Dth, Bellingham 24Deth and SE Oregon 6300 Dth’s. The worst case scenario happens in 2026.

Question: Mark asked Kathi Scanlan if the next IRP due date is due 2 years from filing date?

Answer: Yes

Question: Mark asked Mike Parvinen if there will be a new weather normalization model for the rate case. Mark wants to consider it for the next IRP

Answer: Mike said they are gathering intelligence now.

Question: Jennifer Gross asked if the Demand Side Management section shows distribution planning and avoided costs by zone.

Answer: Mark said yes, it is a challenge though because CNG’s system is so spread out.

* Monica Cowlishaw discussed the “Collaborative Effort, $15m over 5 years toward developing high efficiency Natural Gas. She referenced including rooftops & heat pump water heaters will offer savings in the future. CNG will continue to be involved in this effort.
* Slide #41- Mark stated that a generalized “Carbon Rule” will be in the IRP as the other LDC’s have done.
  + Mark stated that the LDC’s will be working as a group to approach the pipeline together. This will provide cost effectiveness and clarification as well as consistency.
  + The City Gate study will be in the IRP showing CORE & Non-Core but we are interested only in CORE.
  + In 2017 we identify the need for the satellite LNG. Discussions and studies with other departments will be needed to confirm this need.

Question: Chris McGuire said he was confused about the Monte Carlo simulation. He said the presentation showed shocks of weather and price only used to test the deterministic model. Shouldn’t other portfolio options be used to test…how do you know the expected is still considered the “optimal”?

Answer: Devin McGreal answered by stating that the tests confirm no dramatic demand or price like some large quantity of unserved demand, for example.

Chris went on to say that the statement he heard today was that you’ve proven the choice by Sendout is an “acceptable” option, not necessarily optimal. Chris encourages the team to use the Monte Carlo as a tool for both the average expected portfolio cost as well as the spread of outcomes (expected volatility/risk). He cautions the team to be careful with the language used in the IRP. Mark thanked Chris! Mark then stated that he will look for comments on the draft.

* Slide #42 – 2016 IRP Timeline - Mark reiterated that we have had a tight aggressive timeline. He states we will file the Draft 2016 IRP on Monday. The time of day is unknown. The Draft filing will be done electronically, via Email. It will be posted in the IRP CNG Website (this posting may happen on Tuesday but the official filing will happen Monday).

Question: Mark asks Kathi Scanlan if the electronic filing is OK.

Answer: Kathy said “yes”.

* Mark stated that they may make some hard copies.
* Comments are due by NOVEMBER 7 end of day!!
* The IRP goes to press on November 23rd
* There will be a presentation of the Executive Summary to Executive Management
* Official filing will be done on December 14th in Washington.
* Mark then asked if the group had any final questions or comments.

Bruce Folsom commented that a lot of work has been put into this document and on an incredibly aggressive schedule!! **Nice job to the IRP team at CNG!!!**

Question: Laura Flanders asked what the plans were for the LDC’s group to meet with pipelines, as mentioned earlier.

Answer: Mark said they will be getting in touch with the pipelines in the coming weeks.

**THANK YOU TO EVERYONE FROM THE IRP TEAM!**