



### 3rd External TAG Meeting - OPUC

09/07/2017, 9:00 AM to 12:00 PM

**Presenters:** Mark Sellers-Vaughn, Brian Robertson, Devin McGreal, Ashton Davis, Allison Spector, Spencer Moersfelder, & Andrew Hudson

**In attendance:** Mark Sellers-Vaughn, Brian Robertson, Devin McGreal, Ashton Davis, Bruce Folsom, Spencer Moersfelder, Andrew Hudson, Allison Spector, Bob Morman, Lisa Gorsuch & Mike Parvinen.

**Called in:** Garret Senger, Chris Robbins, Eric Wood, Carolyn Stone, Jennifer Gross, Jeremy Ogden, & Kary Burin.

**Minutes by:** Carolyn P Stone

Slide #'s 3,4 & 5 - Brian stated anything shown on the IRP Action plan update in white is not updated, but **yellow highlighted** items have been updated.

Slide #6 – Ashton went over the EPA document released on 2016 environmental impact results. The EPA concluded the results to be inconclusive. There are many data gaps causing uncertainty. Mark said there would be a presentation on fracking during TAG 4.

#### *Presentation #3 – Andrew Hudson*

##### **DSM Presentation**

Allison that Spencer and Andy have done a great job developing this analysis. The level of coordination is appreciated. They have been reviewing progress based on the last planning cycle.

Allison stated that since their OPUC order guidance they have addressed all points and integrated them.

Andy went through today's Agenda. Lisa interjected that the Commission is in a "transitional period" and they are trying to make this transition "seamless". The new commissioner wanted to participate today but will be reaching out later. Anyone having a hard time getting a hold of commissioner should contact Lisa.

#### Slide #12 – About - Energy Trust of Oregon

- Andy explained that the "Energy Trust of Oregon" is an independent, non-profit organization delivering affordable energy & renewable power to 1.5 million customers of PGE, Pacific Power, NWN & CNG.

#### Slide #13 – Resource Assessment Overview

- A Resource Assessment (RA) is an estimate of the available of cost-effective efficiency able to be acquired in CNG service territory.
- Andy explained that, they are using a modeling tool that is "bottom up". It uses residential, industrial, commercial & agricultural inputs. It assesses buildings in the cascade service territory to determine equipment savings and measure opportunities.

**Question:** Is a “stand alone” Natural Gas (NG) company harder to get conservation information for than an electric company? Can you touch on the idiosyncrasies?

**Answer:** Andy states they have “outreach managers” in the CNG territory that connect with customers and organizations and contractors dedicated to those regions. There are locals “on the ground” that help, so it isn’t as big of a challenge.

**Question:** Is it harder to reach “outside” customers?

**Answer:** Andy said he has not heard that it is more difficult to acquire gas savings for these customers. There is instrumental equipment in buildings. Alison added that, in earlier years, there were some challenges in terms of being outside of Portland. The ETO has adapted to approaches to outside customers and ramped up outreach! These issues are being addressed. Andy added, that they have built relationships over time and adapted!

Slide #14 – Background – How is the RA used?

- Andy stated that they take the results of the model and give it to Program Planning, then they help set the deployment of a supply curve. The model does not say what annual savings are acquired by programs nor does it set incentive levels.

Slide #15 – Resource Assessment Inputs

- Andy went over the Resource Assessment inputs:
  1. Service territory data (from CNG)
  2. Demographics - what % of customers have gas and gas hot water, # of homes with insulation & energy use for residential & commercial.
  3. Measurement assumptions
- Andy said that this was the 2<sup>nd</sup> time the model has been used. It is a more direct approach. They use “building stock assessments” received from the Northwest Energy Efficiency Alliance (NEEA) as a primary resource. Their tool is a “bottom up” measure based model. It looks at savings, cost and measure life. Load profiles used and associated savings value related to those.... tells what the savings will be. The model takes incremental savings and tests for cost effectiveness. It doesn’t force us to “guess what the customer will do”! We look at technology that is in “research stage” also.
- Andy also said every 3 years the model is “rescreened” to make sure cost-effectiveness and savings are still the same.

Slide #16 – Outputs

- Andy said this shows the technical potential and all potential savings
- The cost-effective potential – remaining potential after screen applied!
- Hood River offered free services came out 85 - 95% used as #'s for being achievable

## Results

Slide #18 – Cumulative Potential by Type and Year

- This shows the potential by type technical, achievable & cost-effective achievable

Slide#19- Cumulative Emerging Technology Contribution

- 5% of total 20M therms

Slide #20 – Cumulative potential by sector & type (in CNG territory)

- Driven by residential & commercial
- Cost effective override affected residential by 2/3rds when using the override.

Slide #21 – Cumulative Cost Effective Potential End Use

- Coming from water heating and heating savings

- Water heating includes water heating equipment from all 3 sectors, shower heads, aerators, etc.
- Heating load both commercial and residential controls, HVAC is industrial HVAC.
- Behavioral = Commercial strategic energy management, Smart Home Energy devices!

Slide #22 – Top-20 Measures – Cost Effective Cumulative Potential

- This shows the types of measures and their potential savings in therms
- Quite a few from residential paths = new homes!

Discussion of OPUC Exception:

- Allows builders to exceed code – efficient water heaters
- Forces pathways NOT cost effective in also.
- In the end, the savings projection for new home construction is a lost opportunity. Lots of potential shown here but we only get 30%, this is because the homes are built before we can intervene.

**Question:** What % of the market does your program get to?

**Answer:** The % varies, Bend area is growing rapidly!

Slide #23 & 24 – Peak-Day Savings/Peak-Day Savings by Load Profile

- What does energy efficiency do to eliminate the need for Peak Day reserves?

**Question:** Is this involving the 2014-2016 timeframe?

**Answer:** Yes!

- Peak Factor = the Amount of load expense on Peak Day/Annual Load
- $1 \div 365 = .3\%$  savings, happens only on Peak Day
- Some of this data derived from electric profiles – DHW (Electric Resistance Hot Water Heater)
- Residential/Commercial info represents an accurate than electric load profiles from the Power Council.
- Factors X savings correspond with different Load Factors
- For residential/commercial, space heaters drive the heat on cold days!

Slide #25– Market Transformation Savings Forecasts

- Collaborative work with NEEA to drive advancement of codes and help builders comply with new code.
- Savings come from adoption of code!
- 2 years of savings imbedded
- New buildings have not claimed those savings in the past but will incorporate in the future about 5,500 therms, reflected in savings projections ahead....

Slide #26 – Cost-Effectiveness Override in Model – MM Therms

- Andy said they use CNG avoided costs in programs. They use a “blended” avoided cost to reduce cost & standard incentive rates. This “blended avoided cost” might be different than the utilities’ avoided cost calculation.
- When there is an exception, Andy said, to cost-effectiveness from OPUC we expect to make for purposes of the 20-year forecast, they keep measures in, expecting them to be cost-effective in the future.
- This override is applied when measures are found not cost-effective offered through programs.
- Andy stated that they’ve put together a method to forecast savings by:
  1. Changing performance
  2. Using a risk factor score card to hedge uncertainty

**Question:** Is the model “off the shelf” or something you developed?

**Answer:** This model was built by a “Navigant” associate. There are a number of sources used in the model, federal DOE, NEEA...etc.

**Question:** Are new “pilot programs” factored in?

**Answer:** Andy explained that it isn’t considered if it goes through a pilot program, as the cost is too high.

Slide #27 – Cost-Effective (CE) Override – MM Therms

- Shows difference when CE override is applied by sector!
- In residential section, this is about 30% of total \$20m of Cost-Effectiveness savings.

Slide #28 – 2015 Supply Curve – 20-year Technical Potential

- Levelized cost of therms
- Cost effective limit just under 7m therms
- Cost effective override not used in 2015!

Slide #29 – New 2018 Supply Curve

- 20m cost-effective limit, \$1.88 levelized cost
- Common metric used but not how the model identifies what is cost-effective!

**Question:** How are programs providing “negative” level of cost-effectiveness?

**Answer:** This is because of measures with non-energy benefits. This winds up giving a negative cost!

Slide #30 – TRC Score

- At what score can you get cost effectiveness?

## 2018 IRP Projected Savings

Slide #32 – Types of Potential

- Identifies potential, technical, achievable, cost-effective & program savings
- How effective are programs? Retrofit measures... can happen any time
- Replacement – new homes lost opportunities as stated previously. We have a short window of time to intervene, then gone! We get 30 -35% of those savings.
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**Question:** Any known or guesses on why 30-35% of new construction savings obtained?

**Answer:** It’s generally due to “budget builders”. It is hard to get them to spend \$ on efficiency! Builders meet code and that’s it. We make lots of effort to connect with these builders and have had some success....30-35% improvement over the last few years. If we intervene, this drives savings!

Slide #33 – 20-Year Potential by Type

- In terms of trends of programs, the importance is the success and ability to get programs. You can have programs but customers still must make the investment on their own!

Slide #34 – 2015 vs 2018 IRP Savings/Projected & Actuals

- Compares 2018 IRP to 2015 IRP totals
- We have doubled the savings from 2015!
- Using the Navigant model is more efficient and projects closer to reality!

**Question:** Is this an “aggressive” scenario?

**Answer:** Yes, in some ways. This is how energy trust operates. We go after more and more each year. It is aggressive but realistic!

Slide #35 – Annual Projected Savings as % of CNG’s Annual and Cumulative Load Forecast

- 8% of annual load in first 1 to 10 years!
- Cumulative will be over 10% in a 20-year period!

**Question:** Are you double counting Smart Automation savings?

**Answer:** Those are primarily residential. Smart thermostats save heating, smart home automation – we’re not familiar with these measures. It is a challenge annually reviewing measures and the assumptions going into them! The average savings and baselines are at times a concern. Concerns are addressed through continued evaluation and building analysis!

**Question:** How are the evaluations carried out?

**Answer:** We contract out studies, but we do also have an internal team!

**Question:** What is not technically “feasible” mean?

**Answer:** Like a boiler measure – the building might be able to have a boiler but not able to install the boiler due to lack of infrastructure (ductwork, etc.).

**Question:** What are non-energy benefits?

**Answer:** Like shower heads and aerators for example; they restrict water and the customer saves energy and \$ value.

*Presentation #4 – Allison Spector*

**Policies & Methodologies Informing DSM Outcome**

Slide #37 & 38 – Externalities

- Anything outside the control of the company raising or lowering DSM potential!
- Includes code changes to DSM
- Incorporated into Oregon DSM projections
- Carbon Policy Adder – price forecast x 10%

Slide #39 – Capacity Contribution & Value in Energy Efficiency

- We are working on this externality.
- Analysis at the citygate level.
- We are starting to look at NWN’s approach and we think it will benefit us!

Slide #40 – Policies in our Service Territory

- Can impact cost effectiveness of program!
1. National Standard Practice Manual
    - Could be impacts from this.
    - They may use “custom” variables in this manual...?
    - It takes base components based on regulatory goals.
    - We are aware of it and are keeping an eye on it in WA and OR.
    - If adapted, could impact how cost effectiveness is looked at in Oregon.

2. Clean Power Plan

- Executive order evaluated!

Slide #41 – Oregon

1. Renewable goals – greater focus on renewable energy!

2. Increased focus in Oregon on migrating gas to electric, using 1<sup>st</sup>, renewable energy and 2<sup>nd</sup> phase gas to electric.
3. Moratorium on fracturing.
  - This was passed thru the House but not the Senate, so not a law yet, but we are tracking this!

Slide #42 – Washington

1. Carbon Cap bills – None have passed yet, but we are watching closely and it does have traction!
2. Decarbonization – Involves emissions reductions
3. Clean Air Rule – We are evaluating options to comply with this rule

**Question:** Bruce asked if avoided costs are included?

**Answer:** Allison said a presentation of avoided costs will be shown in a few slides. We generally follow the lead of the OPUC. We are primarily a taker of inputs from utilities.

- Mark stated that the CNG forecast contains some avoided costs.

**Question:** What information do you have on Avoided Costs from the Commission?

**Answer:** Next week we will have some information. Could be a recommendation made to parties to have a collaborative effort. Andy stated that Avoided Costs were put in after Alison's talk on policy because there are implications.

Slide #58 - OR annual Avoided Costs used in Resource Assessment

1. We do include Carbon Policy adders...and
2. Risk reduction value
3. Using a capacity value method driven by peak savings. Winter is 0 now, in workshops this fall it will be decided.

\*Starting year going out, each year savings run through Avoided Costs.

Slide #59- NPV Avoided Cost/first-year Therm for selected measures

1. Lifetime of measure (has significant impact on value of savings!)
2. Load profile (time of year of savings occurs)

**Resource Assessment Modeling Tool and Updates**

Slide #44 – Model Assumptions

Slide #45- Cost-Effectiveness Screen

- TRC Cost test = TRC ratio = NPV of benefits/TRC

Slide #46 – Updates to Cost-Effectiveness

- OPUC Exceptions (Docket 1622)
- Non- Cost-Effective Gas measures
  - Weatherization
  - Gas Tank Water heaters
  - Gas Washing machine
  - New homes

Slide #47 – Measure Updates

- Updated measures across all sectors!
- Adding new measures

Slide #48 – Define Measures Incrementally

- Don't count total savings of each technology!

Slide #51 – ET Risk Factor Scorecard

1. 25% market risk
2. 25% technical risk (what stage is the program in, is it a “prototype”, has it been tested?)
3. 50% weight to source of data, how good is it on this program?
4. If low risk technology then 80% factor.

Slide #54 – 2018 Programs, all Cost-Effective efficiency

- Residential, Commercial & Industrial/Agricultural programs

Slide #55 – Cascade Natural Gas & Energy Trust

- Serving Oregon since 2006!
- All customers except the largest NW transport customers

Slide #56, – Historical Performance Against IRP Target

- Net savings here, NOT gross!
- Risk of treating DSM as a resource.
- This shows our net or exceeded goals.
- It is challenging to forecast large project savings results. Large projects swing the results!
- Our planning team has been working on this.

Slide #34 – 2015 vs 2018 IRP Savings

- This gives confidence in looking at past projects vs current!

**Avoided Costs**

Slide #60 – Program Funding (Alison Spector)

- Alison mentioned schedule 31, Public Purpose Funding adjusts over time!

Slide #62 – Revision to Schedule 31

- A revision will be effective 12/1/2016
- Charge increase to 4.87%

**Oregon Low Income Energy Conservation (OLIEC) & Conservation Achievement Tariff (CAT) Programs**

Slide #64 – Action Partners Serving Central & Eastern Oregon

- Action partners provide weatherization, etc. for low income!

Slide #65 – OLIEC

- Covers portion of tariff approved measures, ceiling, floor, wall, ducts, etc.

Slide #66 – Conservation Achievement Tariff

- Established 12/1/2016
- .0625% of gross revenues from electric side & natural gas.
- CAP is the same as for NWN - \$10K

Slide #67 – Achievements & Projections

- 50 homes served per year!
- 100 homes annually if funded at full capacity!

**Other Items**

Slide #69 – Future Action Plan Items (DSM)

- Geographically targeted DSM, coordinate with ETO

**Question:** Can you expand on execution of pilot programs?

**Answer:** Yes, we have done the following:

1. Meetings with ETO Staff
2. Discussed interest in geographically targeted DSM
3. Coordinated in order to have a plan!
4. In planning stages.... find it to be intriguing.... need to look at the constraints on the system!

**Question:** Mark asked Lisa if the action plan items are “quantifiable” and if they are going on the right path?

**Answer:** Lisa said it looks good to her, but she said she cannot speak for others. She said - yes definitely in the right direction. The planning process is an evolution. This changes what we are looking for in the IRP and we need to keep track of changes. She said she knows this is challenging but really appreciates CNG's efforts! Lisa continued that the planning process is a collaborative effort including all stakeholders. She said to remember, this is worked on together and is not an adversarial process! She appreciates all the hard work. She said if she cannot definitively answer questions, she will work hard toward that. She knows we've been working hard!

*Presentation #5 – Ashton Davis & Brian Robertson*

**SENDOUT Modeling Update**

Slide #73 – SENDOUT Model (Ashton Davis)

- The SENDOUT model is used for resource optimization
- Portfolios are developed and analyzed
- SENDOUT is very powerful & complex!

Slide #74 – SENDOUT (cont'd)

- SENDOUT uses linear programming
- SENDOUT is helpful information but not a “perfect” solution – used as a guide
- SENDOUT has perfect knowledge

Slide #76 & 77 – Supply Resource Optimization Process (Brian Robertson)

- At Tag #2, we presented a resource optimization using a Monte Carlo run creating 200 decisions – this was too many and not informative!
- There are 8 steps we use:
  1. See where we are short
  2. Introduce resources to solve
  3. Develop portfolio, run stochastic and weather via Monte Carlo simulation
  4. Rank Portfolios
  5. Change Variables – run Monte Carlo and see how model reacts
  6. Analyze preferred portfolio
  7. Sensitivity analysis
  8. Test other portfolios (EX: NWP only, etc.), select optimal and re-evaluate
- After this, is there any unserved demand?

**Preliminary Results**

Slide #79 – 84 - Results



1. Storage – How SENDOUT informs but does NOT decide!
  - What is the optimal storage? SENDOUT could choose optimal solution (with a mean cost) but unquantifiable factors, humans MUST intervene, not practical!
  - Certain solves may lead to more unserved demand.
  - We assign “penalties” to SENDOUT to prevent certain solves.

Slide #79 – Optimal Deterministic Portfolio

- All Variables in the “Optimal Portfolio”
- Resource Mix – Sendout chooses what resources it wants, we lock that in and run it stochastically.
- VaR – Devin explained that the resource analysts went to a seminar in San Francisco on and learned about the extrinsic value of what your portfolio can do!
- This is if everything works as planned – but have all events been included?
- The model does not do a “standard deviation”
- Peak day analysis is good to use but Monte Carlo doesn’t show “peak day”. In 95% of the cases you can use this value (95<sup>th</sup> percentile).
- Shows the “mean” of costs.

Slide #81 – Total System Cost – only NWP

- Value is higher here
- Doesn’t have storage options!

Slide #82 – Total System Cost – only GTN w/ Incremental Storage

- Almost optimal portfolio!
- Mean/VAR lower with NWP options

Slide #84 – Total System Cost – Only Storage

- This is NOT a solve!

Slide #85 – Mean & VaR

- Ranking Portfolios here
- All Portfolios under same weather curves
- Mark said that Tag #2 meetings’ portfolios will be recapped. This shows the diversity of our system!
- Lisa mentioned that she needs to “catch up”!
- Devin McGreal said they are excited about this process. The capture of extrinsic elements is important!

*Presentation #6 – Devin McGreal*

**Next Steps**

Slide #86 – Next Steps

1. Get together with senior management to determine VaR limit
2. Test portfolios in Monte Carlo
3. Stress test sensitivities – price (high or low), carbon taxes, etc.
4. Select the preferred portfolio (tested against the VaR limit)

*Presentation # – Devin McGreal & Mark Sellers-Vaughn*

**Incremental GTN Capacity**

Slide #88 – Pipeline Transport Flow

- Devin went over the system transport flow, noting our diverse system
- Devin explained that SENDOUT showed a very popular solution – need for GTN capacity!
- Mark mentioned the “direct connect” we have

#### Slide #89 – Upstream Pipeline Capacity Update – GTN

- Mark went over this slide that shows IRP modeling as of July 28 that CNG is short by 400 Dth's per day of GTN capacity
- By the end of year 20 the shortfall is 31,000

#### Slide #90 – Upstream Pipeline Capacity Update – GTN

- The IRP goes over 15 years into 2020
- GTN has been undersubscribed for years, CNG has been picking up daily gas to make up for peak day
- GTN could be highly subscribed around year 2019
- GTN planning on filing with FERC for firm hourly service. CNG should lock in capacity now or it may not be available later!
- Mark explained that CNG has been negotiating with GTN for:
  - Path - Kingsgate to Malin
  - 20K per day
  - 22 years (to 10/31/2039)
  - Starting 11/1/2017

#### Slide #92 – Options

1. Take offer for 2017
2. Take 20K in 2018 (GTN tariff says they are only obligated to take offers 6 months prior to effective date)
3. Take lower amount of 10K for 15 years and lose discount offered
4. Do nothing and continue to buy daily for Peak

#### Slide #93 – Decision

- Mark explained that the GSOC agreed to 10K for 15 years effective 12/1/2017.
- This satisfies peak day needs to 2028/2029
- Mark went on to state that previously this shortfall has been identified and he notes we are now taking steps. It was time to do something!
- He also stated that NWP as offered capacity in the past but been very patient with us.
- Lisa stated that this is like “insurance” on an unknown hedge risk.

### **2018 IRP Timeline**

#### Slide #94 – Timeline

- Brian went over the timeline, stating filing will happen January 25, 2018.

### **Next Steps**

Mark stated he really appreciated everyone coming today!

