Attendees: TAC 6, Tuesday, November 19, 2019 at Avista Headquarters in Spokane, Washington:

John Lyons, Avista; Xin Shane, Avista; Kevin Calhoun, Tyr Energy; Andrew Argetsinger, Tyr Energy; Barry Kathrens, 350.org; Michael Eldred, Idaho Public Utilities Commission; Clint Kalich, Avista; Shelby Herber, Idaho Conservation League; Matt Nykiel, Idaho Conservation League; John Barber, Rockwood Retirement Communities; Dave Van Hersett, Residential Customer; Kirsten Wilson, Washington State DES Energy; Cadie Olsen, City of Spokane; Jason Thackston, Avista; Rachelle Farnsworth, Idaho Public Utilities Commission; Darrell Soyars, Avista; Collins Sprague, Avista; Terrence Browne, Avista; Garrett Brown, Avista; Grant Forsyth, Avista; Logan Callen, City of Spokane; James Gall, Avista. David Howarth, National Grid; and Jaime Majure, Avista.

Phone Participants:

Jennifer Snyder, Washington UTC; Mike Starrett, Northwest Power and Conservation Council; Cassie Koerner, Idaho Public Utilities Commission; Amy Wheeless, Northwest Energy Coalition; Nancy Esteb, Renewable Energy Coalition; and several guest participants who did not identify themselves.

These notes follow the progression of the meeting. The notes include summaries of the questions and comments from participants, Avista responses from the presenter are in *italics*, and significant points raised by presenters that are not shown on the slides are also included. Bracketed comments provide additional details and updates.

Introductions and TAC 5 Recap, John Lyons

Matt Nykiel: Will the Idaho and Washington IRPs come back together? *Not sure, we will discuss later today and with both state Commissions.*

Cadie Olsen: With the limited availability of people to do economic analysis for CETA, has that slowed down the work?

John Lyons: Agencies have been working on it [CETA], but there have been staffing issues. The Washington UTC has a schedule laid out for the next few years for all of the rulemaking required for CETA.

Review of PRS, James Gall

Matt Nykiel: What is the status of the coal contract?

Jason Thackston: We haven't signed the contract yet, but are very close and fully expect it to be signed by the end of the year. [Avista signed a new contract in early December 2016 for coal through the end of 2024.]

Clint Kalich: Can you clarify the statistic 70% green? *70% of our retail sales for Washington and Idaho.*

Matt Nykiel: A similar question as part of the RECs, Avista's goal is for both states. How will both be met since selling Idaho RECs to Washington makes it harder to meet the goal?

Jason Thackston (Slide 3): The purpose of this slide is to show the status of our ability to comply with the Washington law. That leads into the 100% goal.

Matt Nykiel: How does the model handle situations where it is rainy and windy in Spokane, but sunny in Montana? Let's factor in potential at other places, not just here at the office at Avista. *We apply a factor for different locations for availability.* 100% on average or net 100%? *We'll get to that later as well.*

James Gall (Slide 5): Solar includes bifacial panels with a single axis tracker. Hydro includes Long Lake and Post Falls upgrades. We removed the Monroe Street upgrade from the PRS discussed in the last TAC meeting. Wind includes offshore.

Clint Kalich: For BPA, is that federal hydro? *Price is based on a gas plant, but the actual generation may or may not be federal hydro.*

James Gall: Geothermal is not in our region; but is outside our region in southern Idaho, Nevada (in the last RFP), and in Utah that could get here. Nuclear is another option, but it is too big for Avista. Modular nuclear of 100 MW is clean and the right size, but will probably not be commercially available for quite some time. Energy efficiency has been used by Avista since the 1970s, we have saved over 200 MW on average.

Matt Nykiel: How are wind and solar being modeled? *All wind and solar are modeled as a PPA with different locations. On-system wind and solar have an interconnection cost and off-system locations have wheeling costs. Each resource type is assigned a peak credit for contribution to peak loads.*

James Gall: Liquid air storage is easy to scale, with long duration storage requiring more tanks – the same as hydrogen. Flow batteries are both four-hour for vanadium flow and zinc oxide batteries. Both of these are higher initial cost than lithium ion, but have a 20-year lifespan instead of 10 years. Regional transmission as a supply resource is crossed out because we don't know what will be on the other side of the transmission line in the future.

Matt Nykiel (Slide 6): Is the social cost of carbon $50 to $60? *$80 in 2021.* Can you explain how pipeline upstream emissions are modeled? *Losses* to *move gas on pipeline and releases from gas wells. We get all of our gas from Canada, mainly Alberta. The Canadians have a report that shows a little bit less than 1%, times the amount of gas. I don't know the name of the document, but it will be in the IRP document.*

Slide #7: The lower Montana wind capacity factor is used to account for transmission losses. We moved to the upper end of pumped hydro storage projects after talking more with developers. This makes it more reliable like a gas plant. And we added more planning margin.

Dave Van Hersett (Slide 7): How many hours [for pumped hydro]? *40 to 80 hours.*

Dave Van Hersett (Slide 10): Is water heating switching from electric to natural gas? *No, it is for heat pump water heaters. We will cover what you are talking about later today.*

Slide 11: Modeling versus actual acquisition. We think 100 MW from Montana and 100 MW from the Northwest, but anyone can bid into an RFP and provide the wind power.

Mike Starrett: Is the procedural expectation from the Washington Commission an acknowledgment? *The IRP is acknowledged and then any resources we acquire go into a future rate case. We show a need to answer the prudency question in a general rate case. CETA will have a Clean Energy Action Plan.*

Jennifer Snyder: Yes, as of right now, it is a rate case prudency question. Clean Energy Action Plan will be covered later.

Slide 11: Changed pumped hydro up from 150 MW to 175 MW in the PRS and increased demand response from 2021 to 2030.

Dave Van Hersett: DR is? *Demand response, we will get to that later.*

Mike Starrett: The presumption is that it goes away, but have you looked at attributes of Lancaster going forward? *Yes, we are showing that later.*

Matt Nykiel (Slide 12): Did you model opt in versus opt out? *Didn't model it, but about 50 percent more. We have an estimate of it. Dave, did this answer your question?* Yes.

Jason Thackston (Slide 13): 2022/23 acquisitions come online. Issue an RFP spring of next year. Online by at least 2022, but we will look at later dates in an RFP if they are better prices. We would rather do an RFP first, then the IRP. This is our best guess now. Colstrip cannot serve Washington customers after 2025, but could still serve Idaho's one third share or get other owners to agree to shut down.

Matt Nykiel: If it [Colstrip] is not cost effective, it is no longer prudent. *Colstrip could operate at minimums or we could sell it, but we could not unilaterally shut it down ourselves.*

John Barber: On the pumped hydro projects, are there others interested? *Yes, the projects are much bigger than we need. There are other parties interested and they would need even more participants.*

Matt Nykiel: With the cost effectiveness caveat, how does that make the business goal different than business as usual? *Other strategies are RECs with CTs [combustion turbines] to green up the portfolio. We don't want to jeopardize our customer's livelihood for an aspirational goal.*

Matt Nykiel: What is that cost effectiveness test?

Jason Thackston: Good question. We are struggling with that too. There was a lot of squirming in April. We continue to look at the impact of the goal while maintaining

reliability. This goal is aligning ourselves internally. We totally get that from the business side of things. Gap with how it is marketed and caveats they signal are super important. Idaho resources are producing for Idaho customers, but are also going to Washington. There is a signal there so that customers can make an informed decision. This is good feedback. Thanks.

Dave Van Hersett: Increasing my bills is lowering my reliability.

Jason Thackston: The ideal outcome is 2025-2030. Our CFO always notes that hope is not a strategy. Rattlesnake Flat is a good example. It is a good alternative even though we didn't have a need expressly then.

James Gall: We will issue an RFP in the spring, if more resources come in that would lower rates; we will get the extra resources.

John Barber: With liquid air, is it taking it down to the Nitrogen or just the Oxygen? We w*ill need to ask Thomas Dempsey about this. [The liquid air doesn't separate out the gases, it uses ordinary air without separating the different gases].*

Clint Kalich: Can we retrofit the back end of our gas turbines? *We were going down that path, but last I heard it may not work. So, maybe.*

Barry Kathrens: If there is a positive balance, there is more available for [hydro] storage. *We only have two facilities with storage that are already being used. It is already serving the purpose you are describing.*

Jason Thackston: Some hydro can store over seasons, like in Juneau [Alaska]. Building more generation would force more water over spillways because there will still be the same amount of water over time.

Matt Nykiel (Slide 17): Back in 2026, Action Plans features for Idaho customers, the use of Colstrip for customers is undetermined. I'm grappling with it still being used. *You are talking about problems I think about every day. We are always going to run our system as a whole, but there is a cost allocation issue.*

Matt Nykiel: Easy answer from my point of view. *There is a balance that has to be maintained.*

Jason Thackston: You may think it is easy, but it is probably more complicated than you think.

Barry Kathrens: How does a state line affect climate policy? *It determines state energy policy.*

Dave Van Hersett (Slide 18): Emissions are less because you are getting rid of gas burning in my Corvette.

Matt Nykiel: Do other utilities model this [reduced car emissions] even though others made this choice? *CETA is working on this for incentives [on electrification of transportation].*

Clint Kalich: There is precedence in energy conservation. Absent that incentive, the conservation measure may not be installed.

Jason Thackston: Avista has already incented infrastructure for this to enable adoption. Someone chooses to fly and purchase offsets. Utilities are showing this.

John Lyons: This is the free rider problem. Did you purchase a particular energy efficient refrigerator for energy savings, the $50 rebate, or because it looks really good in your kitchen.

Garrett Brown (Slide 19): Is this just residential? *It is an average rate for all classes according.*

Matt Nykiel: Does it include the social cost of carbon? *It is included in the decision, but not in the rate. It is averaged all together.*

Darrell Soyars: Transmission and distribution – yes, assumes 2 percent growth.

Dave Van Hersett: About one third generation plus distribution plus one-third transmission on my bill. *There are four components with the common costs.*

Mike Starrett: When going through rates, it sounds like a composite rate. Can you characterize it for a single residential customer? *No, the best way is to look at it going bar to bar [on the graph]. We probably need to get more descriptive on that.* Is the cost consistent? *This slide is not getting into the scope of how to assign costs to different customer classes.*

Prewritten comments from Dave Van Hersett for his last TAC meeting:

November 19, 2019

Dave's Reflections on the IRP process 1989 to 2019:

I am 80 now and it is time for me to retire and spend more time chasing grandkids and my wife.

Quote from Mark Twain: "Twenty years from now you will more disappointed by the things you didn't do than by the ones you did do. So, throw off the bow lines. Sail away from the safe harbor. Catch the trade winds with your sails. Explore. Discover".

1. **Dave's: background**
    a. Fifth Generation Spokane Native
    b. North Central High School 1957, WSU 1962 Mechanical Engineering, MBA
    c. Veteran, USAF selected Outstanding Procurement Officer USAF 1966
    d. Avista residential customer since 1967.

e. Power Plant Developer: Coal, Gas Turbines and Renewable Biomass Fuels (wood, straw & garbage)
f. Commercial and Industrial Conservation Program Business Development
g. Professional Engineer Retired
h. Technical Advisory Committee Member for Avista's Biannual Integrated Resource Plan since 1989.

2. **Utility is a Three leg stool: customers, capital & utility.**

   All three are dependent upon each other to be successful. Customers provide a steady market, investors require a secure and steady return to make an investment and a staff is the resource to make it happen.

3. **Population dictates constant growth at 2% per year**

For decades the population growth for the Inland Empire has been about 2% per year. This constant for long term planning and almost eliminates the risk of losing market or the customer load for the utility. Thus we have a risk free environment for both the utility and the investor.

4. **Population: 1957, 2019, 2045 : World, USA, WA State, Spokane**

POPULATION GROWTH (million)			
Year	1957	2019	2050
Spokane County	0.25	0.52	0.61
WA State	2.7	7.4	10
USA	172	329	438
World	2900	7400	9800
USA % of World	6%	4%	4%

5. **World pollution contribution & competitive in USA and world**

Points to consider:

a. The population growth is the driving factor for all future generation planning and the operations of the utility to provide services to its customers. A very low risk profile.
b. Note that the USA is a minority player in the world pollution production. Even if we reduced our pollution to zero the remaining world countries

would still be producing the majority of pollution. We only have a minor impact. Countries like China, India and Pakistan each with over a billion population have the major impact on the pollution to the world environment. The only result of our zero pollution is to eliminate our competitive advantage in the world market as a result of our higher production costs that incorporate significant environmental controls.

c. Nobody is addressing the uncontrolled population explosion on our planet. The population growth is the root of all demand for resources and generation of pollution.

6. **Utility has Lost objective to serve customers,**

I have observed that the utilities have lost their way on their path to serving their customers. The customers are the utilities life line and reason for existence. In the last 20 years there have been 13 towns in their service area that have lost their main source of existence, their forest service industries, or sawmills. The utilities have focused on meeting the concerns of the one percenters, like the Serria Club, instead of serving and meeting the needs of their customers.

Spokane, Post Falls, Coeur d'Alene, Newport, Sandpoint, Usk, Ione, Kettle Falls, Northport, Naples, Bonners Ferry, Samuels, Kellogg to name a few.

7. **Accommodate and kowtowing to the *one percenters* : Environmental groups and greenies.**

I have witnessed the domination of the Sierra Club at our IRP meetings. These representatives are not actual customers of Avista and only bring their message to go green with no liability on their part for the higher costs we customers will have to pay and the devastation to our natural resources. Note that less than 1% of the Avista customers actually participate in the environmental programs offered by Avista. Examples such as the higher cost Solar and Wind rates for power. Another example is when the Montana Greenies made a two hour presentation at the IRP meeting to lobby Avista to withdraw from Colstrip and utilize higher cost wind and solar. None of these presenters were actual customers of Avista and they came to Avista because they could not convince their Montana Legislature to terminate Colstrip. I call these Green parties ***the 1 percenters (1%)*** and that I have represent 99% of the Avista customers. These 1% have been accommodated by the Avista IRP staff to a much higher degree than they actually represent in the Avista customer base.

8. **East WA different from Western WA**

Eastern Washington population is more conservative than Western WA population. This is confirmed by the differences of the political representatives. Democrats in Western WA and Republican majority in Eastern WA. Eastern WA has a lower population density and the industry base is mining, forest products and farming. We

harvest our natural resources with hard work and longtime husbanding of these natural resources.

9. **UTC to protect customers from utility**

In the three legs of the utility business the UTC protects the customers from abuses by the utilities. The UTC was brought about because of abuses by utilities over the years.

10. **UTC to differentiate between East and West WA on implementation of regulations.**

It is my contention that the UTC should take into account the differences between the East and Western Washington populations in their implementation of the regulations. We do not need nor do we want to include higher cost Green generation. We want lower cost and more reliable fossil fuel generation.

11. **Loss of forest products industry & towns since 1980's**

Since the 80's there has been a major loss of industry in the forest products area towns. 13 of these towns in Avista's service area have lost their sawmills, and the thousands of jobs they provided for the past 100 or more years. The utility catered to the environmental movement, (ie. 1%ers) and did not aggressively fight for their continued existence of the forest products industry and their longtime customer base.

12. **Installing High cost wind and solar, no benefits to customers, revenues go outside of customers.**

The utility is bending and accommodating the installation of higher cost wind and solar generation who's investment is bringing no real value to the Avista customer base. The costs to support these green generation resources sends our utility payments to investors outside of our service area. These green resources require subsidies to make them somewhat closer to the costs of traditional resources. The cost of green generation resources increases the overall cost of power to the customers.

13. Oppo**rtunity to revise forest products industry and improve forest production/reduce fire**

The May 2019 passage of the CETA act creates a market opportunity for the inland empire forests and barren lands. If one assumes that the Green Movement and population growth will continue into the future, we have the barren lands without population and forests that grow independent of politics that create a business opportunity for our area. We can develop Green generation resources for sale to other utilities utilizing our local natural resources and labor.

14. **Dark side of Green: cost and eliminates competitive position of PNW and customers.**

The Dark side of Green is the much higher cost and less reliable generation resources to replace the long time reliable fossil fuel generation resources. An analysis was

prepared by several PNW utilities that concluded that the cost to implement the Green Resources by 2045 would result in increasing our power cost by three times. This cost information has not been included in the efforts of the 1%ers. Increasing our power costs by three times will eliminate our competitiveness of our industries here in the PNW and the world. This will then result in the further loss of jobs for our population and a weakening of Avista's customer base.

15. Cogeneration: small to large: approx. 100 mw.

The Avista load is approximately 1500 MW. The potential for cogeneration is in the order of 100 MW. This is minor part of the generation resources but is a major enhancement for the customer. The utility has bypassed the opportunity to create a customer based generation resource in favor of higher cost wind and solar. Implementing a customer based generation resources will build a stronger customer base by proving another revenue source for the customers investing and operating businesses in Avista's service area. It is to the advantage of all of the Avista customers to have a financially sound customer base. Instead the utility has focused on easier generation resources such as combustion turbines green power to provide for new load growth. The potential for customer based cogeneration is small percentage of total load and would require aggressive and cunning promotion by Avista. This is a proven skill of the Avista staff.

16. Use Renewable biomass generation to firm up wind and solar

We are fortunate to have established forests that can provide a renewable fuel supply for biomass generation for generations to come. These biomass plants are ideal for firming up wind and solar generation when the latter are not operational. We owe this to our customers.

17. Garbage is 50% biomass and renewable: 1 ton per person per year

Garbage has the same heating value as a fuel as forest residues. People generate 1 ton of garbage per year and it is renewable. 50% of the garbage is paper products. This is the same fuel as renewable forest residues. Garbage as a fuel supply will generate about 5% of the annual energy needs of the population. In turn using it as a fuel will eliminate long term creation of unusable lands created by the land fills that garbage is hauled to. We will need these lands for coming populations.

18. Never understood the Utility customer conservation programs.

One of my pet peeves is the utility conservation programs presented to the IRP meetings. I have been confused and could not understand the terminology used by the presenters to justify their projected conservation savings. There seemed to be a double standard for customer sponsored conservation projects as compared to inhouse improvements. Remember that the conservation funds come from the customer for the customer, not for the exclusive benefit of the utility. Example of double standard, Avista

smart meters vs customer information system improvements to reduce energy consumption.

19. **IRP staff very skilled and very good. Just need their efforts directed to customer enhancement.**

The Avista Staff involved with the production of the IRP are very skilled and we are grateful that they are working on this product. They have to generate a viable 20 year plan taking into account all of the technical and political variables. This is not an easy task and they should be acknowledged and complemented for their fine work.

20. **Utility legacy for 2020's: dedicated to bring back forest products industry utilizing renewable forests, not leaving the forests for a fuel for forest fires.**

You have the opportunity to generate and leave a customer oriented legacy of utilizing our region renewable and natural resources to provide for future energy needs. You also have the opportunity to bring back the forest products industry to all of the towns in our region. The objectives of the ***one percenters*** is not in our best interests as their goals promote forest fires, degradation of our renewable forests and loss of jobs for our customers.

21. **Develop Limited potential of customer based generation and utilization of regions renewable biomass resources. Provides stronger customer base for all and benefits the utility and the capital providers.**

We should be continually working to enhance the viability of our customer base, the foundation and reason for the existence of the utility. Not kowtowing to the goals and demands of the 1%. The customer base has demonstrated and stated their desires by less than 1% participating in the conservation programs to utilize wind and solar options. Thus 99% want reliable low cost and reliable electric and gas service.

22. **What is your legacy going to be? Selling company for bonus or enhancing your customer base by bringing back forest products industry? Providing employment for our children of the future or under utilizing our natural resources?**

My vision for your legacy would be to take advantage of the recent CETA legislation passed by the 1% to bring back our region forest natural resources, bringing back the jobs and economies of the past, restoring industry in the towns that have lost jobs, reduce the potential of destructive forest fires, improve the production of the forests. We know that we will have the need for more jobs every year and you have the resources and skills to make this happen. The customers need reliable and low cost energy services. The utility needs a stable and viable customer base. The capitalists need a reliable low risk market to attract their investments.

In closing it has been my privilege to participate in the IRP Process. I appreciate and thank you all for your efforts to integrate the demands and objectives of the

many interests wanting a piece of the requirement to provide long term reliable energy resources for your customers. Keep in mind that customers want low cost reliable energy supplies, the 1% have social goals in mind. Dave☺

Background for Presentation

- Population Growth Establishes Demand for Energy
  - *Slide #1of Population Growth of Spokane, WA state and World*
- Spokane current electric load is 300 Megawatts
- Inland Northwest Resources
  - Mining available Mineral Resources
  - Forests that grow renewable lumber products and biomass fuels annually
  - Garbage
- Utilities Regulated by Washington Utilities and Transportation Commission (WUTC)
  - Requires utilities to provide low cost, reliable electric power to customers
  - Monitors compliance with State and Federal regulations.
  - Requires a Biannual Integrated Resource Plan providing power for next 20 years.
- Clean Energy Transformation Act (CETA) May 7, 2019
  - Commits Washington to an electricity supply free of greenhouses gas emissions by 2045
  - Eliminate Coal and Carbon fuels.
  - Require Renewable Energy Resources such as Wind, Solar and Biomass (Wood)
  - **When fully implemented electric rates will triple**
- Less than 1% of Avista customers purchase higher cost Wind and Solar Electric rate option.
- Description of Wind Power Plant (Palouse Wind Project: 30 MW)
  - *Slide #2 comparing Wind Power Plant to Sea First Building.*
  - *Slide #3 with 556 Wind Power Plants located in Spokane*
  - Spokane Wind Power investment $450,000,000
- Description of Solar Power Plant (Lind Washington Solar Project: 28 MW, 170 acres)
  - *Slide #4 of 28 Megawatt Wind Solar Project located on 201 acres farm lands*
  - *Slide #5 of 860,000 solar panels on 2100 Acres in Spokane*
  - Spokane Solar Power investment $300,000,000
- Description of Avista's 53 MW Biomass Wood Fueled Project at Kettle Falls
  - *Slide #6 Avista's Project Brochure*
  - 250 Megawatt Biomass Project Investment: $625,000,000

Utilizing Inland Empire Biomass Forest residues for Electric Power Generation

- Provide power when wind does not blow and sun does not shine
- Harvest natures renewable biomass resource rather than letting it rot on ground
- Reduce fuel for major forest fires
- Bring back vibrant forest products industry, its jobs and towns to Inland Empire

Biomass Power potential from Inland Empire Forests – 670 Megawatts of Dispatchable Power

- Hogg fuel steam generation (50 MW) Kettle Falls Power Plant
  - Slide #7 Hogged or ground up unused parts of sawmill production
  - Slide #8 Ground up logging residues
  - Historically burned in wigwam burners at sawmills
- Logging residues (200 MW)
- Thinning stagnant lodgepole stands (200 MW)
  - Timber growth from past forest fires, undesirable timber
- Cogeneration at sawmills (90 to 150 MW)
- Wheat Straw (add 10%)
- Municipal Refuse (50 MW)
  - 1 ton garbage per person per year
  - 10,000 tons per year per megawatt
  - 500,000 population of Spokane area

Unique Economic Development Opportunity

- We have large forest areas, dry land farming acreages, low population
- A population that would favor development of its renewable and dispatchable resources.
- Wind and solar additions to utility systems require a dispatchable resource to make wind and solar a reliable dispatchable resource.
- Recent rash of forest fires makes a strong case to change the forest management practices of today to minimize the probability of and size of forest fires.
- Power generated from a biomass fuel source qualifies as a Renewable Energy Credit (REC). This is a product that other utilities purchase to offset generation from non- renewable resources.

Implementation Plan

- Put together a collation of Inland Empire elected officials, US Forest Service in Colville, area sawmills and Avista to sponsor a program to:
  - Produce a reliable Renewable Biomass Fuel Supply
  - Reduce likelihood of forest fires
  - Improve yield from our region forests
  - Bring back the forest products industry to the inland empire

- Seek Representative Cathy McMorris Rogers to assist in sponsoring legislation to make this happen. She is from Kettle Falls and knows the forest products industry.

Portfolio Scenario Results, James Gall

Matt Nykiel (Slide 5): Is Colstrip operating in portfolios 10 and 11? *Yes, those portfolios assume that CETA doesn't exist.*

Rachelle Farnsworth: Question on reliability for these portfolios. *I haven't validated them. They are likely close to being reliable, but cannot guarantee it. Numbers 4 and 5 are concerning, but the PRS is reliable. It was not as certain in the last TAC meeting, but the PRS is reliable now.*

Matt Nykiel: Do I understand right that numbers 2 through 15 have not been tested for reliability? *We are more comfortable with the plans that include all of the existing turbines. Taking reliable units away from a portfolio makes it more unreliable.*

Matt Nykiel: Is it a double counting issue?

Clint Kalich (Slide 6): Surplus capacity is benefitting renewables now. It will be different if we retire resources. As we add more renewables, diversity is a benefit. But, more renewables need more backstop.

Slide 14: At least some of them with the social cost of carbon. All except for the ones without CETA. Number 15 shows with the social cost of carbon – risk plus cost.

Dave Van Hersett (Slide 19): Are those are the retail rates that include transmission and distribution? *Correct.*

Garrett Brown (Slide 20): On top, what hydro is that? *BPA, Mid-C utilities bidding in.*

Slide 21: Shows what is the cost of Idaho keeping the RECs for themselves.

Clint Kalich (Slide 21): Are rates backwards? *No, losing the opportunity to sell RECs to Washington or to someone else.*

Dave Van Hersett: Haven't sold them [Idaho share of RECs] yet? *Right, this is the cost of keeping the RECs for Idaho.*

Garrett Brown: What happens to the RECs today? *Washington buys Idaho's share of qualifying hydro RECs from Idaho for I-937. Palouse RECs are sold in the market or to Washington customers for I-937. Rattlesnake Flat RECs will likely be sold in the early years.*

Matt Nykiel (Slide 19): For portfolios #15, 7 and 8; I assume the party's shares in costs for Colstrip remain the same. *Yes, we only pay for our share*. *If, in the highly unlikely situation where an owner didn't pay their share, the plant dispatch would be lowered by*

their ownership amount. Number 15 shows the scenario where all of the shared costs are paid for by one unit.

Rachelle Farnsworth (Slide 19): Why is number 2 high risk? *There is no renewable acquisition in that scenario, so there is more variability. So #2 has a fixed price, but also includes fuel variability.*

Matt Nykiel: What are the Idaho risks with portfolio #3 – Avista's goal? *They are the economic cost of the clean energy goal.* So, Avista's goal should be 100% clean for Washington only.

Dave Van Hersett (Slide 25): When you say social cost of carbon, is that a tax? *This assumes it is a tax, but we don't know where it [the money] goes. It is an extra cost of generation that is borne by customers.*

David Howarth (Slide 27): Is this system wide or just in Washington? *This is just Avista emissions, but the wider market prices effect Avista's dispatch of resources.*

Barry Kathrens (Slide 33): What is the service territory population?

Grant Forsyth: About one million electric only with 1.9 cars per household.

Dave Van Hersett (Slide 34): Is that emissions net of generation? *Just the petroleum emissions avoided from more electric cars, we will talk about the rest of the emissions later.*

Grant Forsyth (Slide 37): The households we serve have about 70% natural gas penetration. *Assumes new homes are going all electric or switching from gas to electric when appliances fail.*

Mike Starrett (Slide 38): Assuming that is all powered by electric resistance heat? *Yes, we will get to that in the next slides.*

Dave Van Hersett (Slide 44): Is the arithmetic on the right side correct? [Slide fixed before posting].

Clint Kalich: It looks like the bigger bang for the buck is petroleum. Did you do a one off calculation on this? *No, but will if you direct me to since you're the boss.* No, you're still self-directed.

Mike Starrett: I don't disagree with the analysis; it is fundamentally balanced, wondering about new homes including air conditioning connection between the supply side and gas/electric? *A lot of our distribution feeders are peaking in the summer because of heat plus load. Then adding an EV [electric vehicle] is less of an issue in the winter. Air conditioning is about 7 kW and an electric furnace is about 11-12 kW.*

Dave Van Hersett: Will there be an all source RFP for capacity? *Yes, capacity and associated energy.*

Mike Starrett: Expand on previous opportunity for seasonal or term? *Winter focused need, but we do not limit by season.*

2020 IRP Action Items and Overview, John Lyons

No additional notes for this topic.