

Attendance: 53 attendees, 3 webinar and 5 telephone participants

I. Introductions by Loyd Drain, Wyoming Infrastructure Authority (WIA)

Loyd opened the meeting at 11 am MT. He welcomed the participants and acknowledged Bryce Freeman from the Wyoming Office of the Consumer Advocate, and Wyoming Pipeline Authority representatives Colby Drechsel and Brian Jeffries. Loyd discussed the partners' involvement in the projects and went through the Standards of Conduct developed by the Northern Tier Transmission Group.

[Slide 2]

Loyd expressed his appreciation for the attendees' participation and interest in the projects. He acknowledged the partners in the project: PacifiCorp, National Grid (NG) and the Wyoming Infrastructure Authority (WIA).

Participants in the room introduced themselves and a roll call was done on the phone. (See attendance document)

[Slide 3]

Welcome and Introductions:

APS, PacifiCorp, National Grid, and the WIA in accordance with the WECC Regional Planning Review Process, the NTTG and SWAT planning processes, and FERC Order 890, request stakeholder feedback on the TransWest Express and Gateway South projects.

[Slide 4]

II. David Smith, National Grid

David welcomed the group and discussed the partnership and the regional planning review process. David went through each company partnering the project.

David stated that APS has been developing the TWE project for several years. Arizona is the fastest growing state, with significant load growth. David added that PacifiCorp is one of the largest transmission owners and has great load growth as well. David provided information on National Grid and the regions that the company serves. He noted that NG is now working on its first project out in the west. He recognized the WIA and its mission and that Wyoming as a state is the largest exporter of energy in the U.S.

[Slides 5-8]

David discussed the co-development agreement and the development of the project. David stated that the agreement established a partnership of the four parties. NG is the lead developer. David noted that the agreement allows for initial development to take place and that a work on several different fronts is currently being performed.

[Slide 9]

David explained that co-development of the projects allows each project to maintain its independence. The load-serving entities will address serving their loads and transmission customers will be able to get more involved in a larger scaled project.

[Slide 10]

David discussed the regional needs and how the projects would meet those. Both projects provide benefits. David indicated that the projects would provide a prudent, reliable system and reinforce the Wasatch Front, as well as provide improved access to regional resources. David indicated the two projects together with the AC/DC combination would provide improved reliability and capacity. This will allow 3rd party access to more economic transmission, improve resource diversity, enhance wholesale markets, and provide access to renewable energy in Wyoming.

[Slides 11-12]

David completed his presentation and opened the floor to questions. No questions were raised and he then introduced Peter Krzykos from APS and turned over the presentation to him.

III. Peter Krzykos, APS

Peter addressed the need for the projects and noted that most of the population growth is in the western US, and particularly in the southwest. He indicated that the TWE project has been underway for three years. Peter noted that the growth for Arizona is tremendous over the next 20 years. Over 8,000 MW will be needed by 2025 and the TWE project will help address that need.

[Slides 13-14]

Peter then discussed the stakeholder process. He indicated that several regional planning meetings have been held, beginning in November 2005. Meetings were also held in March and June of 2006. The partners have been active in regional updates with the sub-regional planning groups, WECC and SSG-WI. The technical studies for the projects have been shared with the groups.

[Slide 15]

Peter then moved on to discuss the map and the project alternatives in the feasibility study process. TWE is a 3,000 MW project, covering 2,000 circuit miles. Peter noted that it was cost-effective at \$2.3 to \$3.2 billion. He discussed the routes of the projects and the synergy with Gateway South regarding the Right-of-Ways.

[Slide 16]

Peter discussed the parties who have expressed interest in the TWE. Salt River Project, Tucson Electric and SCE have all expressed interest in participation. National Grid is the development manager, with WIA joining the project team. PacifiCorp is on board to co-develop the project with Gateway South.

[Slide 17]

Peter opened the floor to questions, hearing none, he then handed the meeting over to Craig Quist, From PacifiCorp.

IV. Craig Quist, PacifiCorp

Craig described the Gateway South Project being developed by PacifiCorp. It is one of two large projects being developed by the company. Craig noted that Gateway West is the second project PacifiCorp is developing. The Gateway West project starts near Dave Johnston in Eastern Wyoming. The line involves Aeolus, which is about 15 miles north of Miners, which will head west to the Jim Bridger substation then on to Populus, and then continues on over to Midpoint in Eastern Idaho. He noted that PacifiCorp is investigating a possible terminal to the Pacific NW. The Gateway West project is being co-developed by Idaho Power. Craig added that a 3,000 MW rated line will be heading west out of Wyoming and south to Aeolus. He noted that in the base case PacifiCorp is looking to add a 345 kV line out of Sigurd.

Craig noted that the Salt Lake line will be going to Mona, with a 500 MW option going to Red Butte and Crystal. Craig said that the reason the Red Butte line is needed is due to load growth in St. George, Utah. The Wasatch Front is broken up into Salt Lake, Provo and Ogden. PacifiCorp has identified significant load growth by 2022 on the Wasatch Front – at least 2,500 MW. Regarding PacifiCorp's IRP, Craig indicated PacifiCorp is projecting 8.5% of renewable energy on its system over its six-state territory. Craig added that there have been many requests from merchant and wind developers for capacity on the lines. Both PacifiCorp and Idaho Power are looking to spend \$4 billion each on these two projects to keep up with load growth.

[Slide 18]

Craig noted that there have been several stakeholder meetings to seek input on the Gateway South and West projects. The transmission needs have been examined in both PacifiCorp's Integrated Resource Plan and in the Northern Tier Transmission Group (NTTG) process. Craig added that the NTTG has a meeting planned in Boise in mid November.

[Slide 19]

Craig went through the reference case. He indicated the project would carry 3,000 MW from Aeolus to Mona with two 500 MW lines that will be in service by 2014. PacifiCorp is also looking at possibly a 345 kV line from Sigurd down to Crystal. The Utah to Nevada lines will carry from 800 to 1,500 MW that will be either 345 kV or 500 kV AC. He noted that it's a big project that covers a lot of area.

[Slide 20]

Questions and Answers

Audience: What is the relationship of Aeolus to Medicine Bow?

Craig: There is a line out there called the Dave Johnston line. This will be located roughly 15 miles Northeast of Miners. The line will be approximately 22 miles to the northwest of Medicine Bow, basically to the north of Highlands.

Audience: Do you anticipate any generation from coal-to-liquids resources for this project?

Craig: Yes. In fact, right now PacifiCorp is working on a coal-to-liquids project and is in discussion with the WIA; that technology is definitely on the horizon.

Audience: What is the in-service date of Gateway West?

Craig: It is early 2013 – one year ahead of the Gateway South.

Audience: Are you saying the line from Mona to Sigurd will interconnect? And will this line be able to handle the capacity?

Craig: Yes. Right now from Mona to Sigurd there is enough capacity to handle that additional transfer. If more power is needed we'll determine the need of extra 500 MW lines based on requests and needs.

Craig handed the meeting back over to David.

V. David Smith, National Grid

David discussed the potential design solutions for the two projects. Currently system studies are being conducted and stakeholder input sought. David noted that the partners are looking to firm up the capacity to the Las Vegas market. Configurations under study include from 4,500 MW to 7,500 MW export out of Wyoming. These represent plus and minus 1500MW solutions from the 3,000 MW Gateway South and 3,000 MW Transwest Express reference cases.

[Slide 21]

David discussed the needs assumptions for both projects: sinks and sources. The sinks are located in Utah, Phoenix and Las Vegas and we have included ten –year expected growth demands. Economics indicate it best to build the DC line as large as possible and fill it.

[Slide 22]

David then discussed the design solutions that have been designated for the projects.

[Slide 23-24]

David reviewed the resource plan being developed to progress the projects through the transmission rating process. Based on the duration to build transmission to export Wyoming's resources is greater than the duration to develop those resources, the partners have developed a resource plan for the express purposes of the transmission studies. This resource plan was developed utilizing input from the PacifiCorp 10 year IRP and 20 year business plan for the Gateway projects and an independent study of potential resource developments within Wyoming for the TransWest Express project. The resource plan for transmission purposes includes coal, natural gas and wind, with 6,100 MW slated for Gateway South and 3,100 MW for Transwest. The total amount of MW required at 9,200 MW.

[Slide 25]

David moved on to discuss the transmission resource bubble diagram being utilized by the engineering team.

[Slide 26]

David identified the numerous projects that are complementary with the TWE and Gateway South projects.

[Slide 27-28]

David reviewed the timeline for the projects. The partners held a Stakeholder meeting in Salt Lake in October, plus the meeting in Cheyenne, and a meeting in Phoenix is scheduled in December to discuss the development process. David indicated that the partners are in the process of finalizing applications to be filed by mid November.

[Slide 29-30]

Questions and Answers

Bill DeGraeve: Who provides the numbers for the needed resources? Regarding wind specifically, what do these numbers represent and what is going to be built in Wyoming?

David: To put it into perspective, this is our view of the collective resources that could be developed. First let me describe what we think the potential for WY resources are. From work performed for National Grid and the WIA, Black & Veatch have determined through examining physical opportunities and constraints in Wyoming that there is the potential to develop between 6 to 10 GW of coal and 14 GW of wind. We did not identify the potential of gas fired development because we don't see this limited from a physical perspective. The resources identified within this plan are not the final resources for these projects. The utilities and resource developers will be determining the ultimate levels of various resources associated with this project.

Bob Kayser : Discuss the TransWest Express line and capacity north of Dave Johnson into Powder Basin.

David: What we are doing now is analyzing where the terminal should be located. We're trying to show a representative view of the location of the terminal which may be influenced by the resource mix. We're looking to locate the DC terminal in the center of the potential resource sites. At this point we are looking at a location for the TransWest Express terminal north of Dave Johnson.

Tom Darin: Referencing Slide 25 [Resource Plan for Transmission Studies] , could you explain the hypothetical resource mix that is being projected on the WECC system – is there any way that WECC requires a blended mix to do the transmission study?

David: Yes. In general, the hypothetical look is to take a mixture of resource types that makes sense for the area of line terminations. It is in our best interests to look at the utility renewable portfolios. Our view is that if we are to invest billions of dollars in a transmission line, you would need to be improving upon on the future renewable mix.

Tom Darin: Is there any way when doing the blended mix for the transmission study to look at a second set of resources and submit an alternative wind only resource plan that would allow carbon sequestration to catch up?

David: Yes, however there are some limits in the number of options we could take into the WECC Rating process. We are already looking at several different options. We could explore this, although we believe the mix of coal, wind and gas, which basically comes down to synchronous versus non synchronous generation, is a sufficient to test for the different types of resource mixes that may ultimately be put on the line from a technical perspective.

Craig Cox: I am wondering if participating parties are working with the NREL lab, who anticipates a lot of wind.

Peter: As the chair of the renewable task force group for AZ and NM, both AZ and NM do have RPS goals and we are looking at all kinds of resources. However, wind is not exactly the best renewable resource in the Southwest as it has a very low capacity factor and will be difficult to produce much energy from a RPS perspective.

David: We are also looking at examples from the UK and other countries that have taken place over the past few years. There are some good examples to consider as we go forward that we will use as a reference points.

Gerry Stellern: How are you meeting the specific needs and requirements of the public service commissions as related to the timeline? Also what are the certificate of needs per state and what's the state commission view for transmission and resources plan?

David: There are different requirements for each utility. We are committed to meeting these requirements and are currently performing due diligence. We are looking at the NEPA process that has a purpose and need requirement, as the primary initial process and plan to initiate the various state processes once the NEPA process is underway.

Thomas Carr: Are you going to be addressing the economic analysis or is this first stage largely technical?

David: This stage of the process includes consideration of technical and economic aspects of the project. The Rating Process, which we've proposed the Resource Plan for, only considers technical aspects. We are working on the economics for the project.

Thomas Carr: Earlier analysis of the TWE showed expenditures in regards to transferring resources, along with a fuel mix of different numbers. Can you explain the route with the numbers?

Peter: The earlier study of TWE identified a mix of wind and coal resources. Moving forward we have identified various resource mixes and looked at possibilities to levelize wind.

Thomas Carr: Would you think of using the FEAST type model for a quick analysis for exporting WY resources to the southwest?

David: The economics we are looking at now are beyond the FEAST representative model. Although we can run the FEAST tool to show from a high level perspective of the resource analysis of exporting WY resources to Utah and the Desert South West.

Craig: RMATS has already run the analysis in previous work before the FEAST tool. The results from RMATS referenced the congestion problems and showed solutions to solve the resource needs. RMATS is a production cost model that was used for the calculations which goes into more depth than the FEAST tool. FEAST is a tool used for initial screening to provide a quick view of what could take place with different resource mixes and the transmission to transfer those resources.

Stephen Brown (phone): TransWest Express will have infrastructure in both Northern Tier and WestConnect, which are of two distinct sub regions. The TWE line would travel the length of the Gateway West in WY and would parallel the Gateway South project. What are the potential difficulties?

David: Actually both TransWest Express and Gateway South will span both sub regions. We have been working with SWAT/WestConnect and NTTG on the development of these projects and we are committed to work and coordinate between both groups.

Stephen Brown (phone): CO PUC has concerns that if all lines were built this would increase transfer capability and possible operational problems of having adjacent lines in parallel. He recommended peer to peer interconnection.

David: We want to coordinate the requirements of the WECC process and plan to run sensitivity cases to look at interim processes of multiple projects. Detailed technical consideration of the projects will take place in Phase II of the WECC process. We have been meeting with representatives of the Gateway West and High Plains Express projects. In general, the expansion of transmission along parallel lines, for example Gateway South and TransWest Express, improves reliability. Additional expansion along parallel routes would enhance reliability.

V. Loyd Drain

Loyd completed the presentation and asked if there were additional questions. The group agreed to break for lunch and to pick discussion after as a stakeholder forum.

Questions and Answers / Stakeholder Forum

This discussion was started after lunch as part of the stakeholder process with David Smith opening the floor for discussion. David asked if Tom Carr to provide an overview on a project that he is working on.

Tom Carr provided an overview on the work that WIEB (Western Interstate Electric Board under the WGA) is doing with Lawrence Laboratories, National Energy Renewable Laboratory and National Energy Technology Laboratory. The group is utilizing the FEAST model that PG&E created to look at economics for the Frontier study in early 2007. Tom said they are using FEAST to look at scenarios to export resources out of WY to AZ and run comparative analysis to gas, coal, wind, versus local generation within the state.

- The presentation is to be posted on WIEB website by the end of the month, www.westgov.org/wieb/
- Preliminary results show hybrid wind/advanced coal generation solution is economic and feasible

Craig Quist : Were reverse ramp rates reviewed and/or gasifiers running all the time in the FEAST model?

Tom: He referenced that a coal-wind power hybrid with a fuel -production coal or syngas storage was studied and is very compatible and is technically feasible. Tom said future work is required for precise estimates.

Gerry Stellern: What about coal in Wyoming and what relationship would there be for the resource mix? More specifically, are the developers were looking at pulverized coal or gasified?

David: We have not specified they type of technology within the Resource Plan developed for further Transmission Studies.

Gerry Stellern: Have you thought much about how coal and wind will mix?

David Smith: The economic analysis will develop further the resource mix beyond are proposal to take forward for the Transmission Studies. We have initiated these studies, however final determination of the mix will not likely take place for several years. We are focusing on building the transmission line to the resources or fuels in Wyoming and let the resource

Gerry Stellern: Do you need to figure out capacity of transmission line with capacity factors

David Smith: Capacity factors are not important for the transmission studies. Line utilization, as measured by capacity factors, is a key driver in the economic analysis.

Gerry Stellern: Is there a certificate of need for the projects?

David Smith: They are not required at this stage of the projects. We are conducting due diligence on the required permits and certificates and we have identified that certificates of need may be required based on ultimate routing.

Jerry Vaninetti: As long as DC line is concerned how do you plan to operate? Will the DC line mirror the load of say Phoenix load requirements and what do you anticipate the generation to be. What level of capacity factors do you expect to operate?

David Smith: We have not worked out these operational parameters, although we would most likely have the load following function supported by gas fired generation in Wyoming. We haven't finalized this as it is dependent on the resource mix, we do anticipate operating in the 60 to 80% capacity factor range.

Kristen Janicek: When the line is built, is it expected to be incorporated into the rate base? Or how do you expect to do that? How do point-to-point transmission rates work? Will there be a pancake rate effect? Nobel has a wind project near Happy Jack which is about 10 miles NW of Cheyenne. If they were to get WAPA to transport energy to the project DC terminal near DJ, would she have to pay WAPA's tariff?

David Smith: To answer the first part of the question, we are looking into the options on how the lines will be paid for and how and at what type of rate structure the lines will be offered.

Bob Easton: Will you help me understand what is meant by over building and what does it mean for this project?

Tom Carr: He referenced the work that Dave Olsen did for the Frontier Feasibility study where 'over building' the number of wind turbines by 10 to 20% and that a resource mixture would alleviate some of the capacity factor issues.

Bob Easton: How does it not make the wind economic?

Tom Carr: It is more efficient based on the Dave Olsen report in reference to the work that was done for the Frontier study.

David Smith: The term 'overbuild' is an example of the current assumption that energy and capacity need to be offered by the same resources. In the case of a resource that is only available at roughly 40% of nameplate rating you need to look at differently and consider other options such as overbuilding which is essentially an optimization of transmission utilization. There are only a handful of days or hours in a year where of wind generation is at 100%.

Aaron Clark: Refer to slide #25 [Resource Plan slide], are these totals for the entire project?

David Smith: Yes, you can look at the total resources referenced to the columns on the right.

Aaron Clark: Looking at same slide, where is upper Green River and what is the gas source?

Craig Quist: The Upper Green River is a natural gas extraction area. Green River is north of Jonah around the Pinedale area. Note that this a hypothetical resource used for the purpose to meet WECC requirements. PacifiCorp does plan to use a natural gas resource although the site depicted here may not be at the exact location.

Aaron Clark: Has there been a ROW application filed [to build a line to this Green River site]?

David Smith: I don't know if this route has been filed as part of the Gateway West project.