NTTG 2019 Economic Study Request (ESR) Report (revised 9-12-19)

Executive Summary

The Technical Work Group (TWG) study, using stressed power flow (PF) cases for the NTTG footprint, showed acceptable performance covering the ESR scenario for year 2028 for all the relevant stressed condition cases that were used in development of the dRTP and demonstrated reduced capital costs, however, at the cost of added transmission congestion and dumped energy in Wyoming. The power flow portion of the study focused on the impacts serving loads in the Wasatch Front and did not address impacts serving other PacifiCorp network loads.

While the study demonstrated acceptable system performance, additional production cost model (PCM) simulations indicated that the proposed ESR 345 kV transmission had lower overall transmission capacity than the planned dRTP 500 kV transmission resulting in increased flows on transmission exiting Wyoming, including non-NTTG transmission and some generation dispatch decrease in Wyoming due to inadequate capacity. This capacity limitation forced generation to increase in Utah in the PCM simulations, dispatching it without consideration of economics.

In addition to the economic and capacity limitations, permits and right-of-way for the proposed 2-345 kV lines option on separate rights-of-way may be a concern assuming that an additional 12-15 years may be required for securing these rights and associated permits. In order to support PacifiCorp's customer needs, PacifiCorp is already in the process of building Aeolus to Anticline 500 kV transmission system in WY, scheduled for energization in 2020. In contrast, the proposed ESR 2-345kV option has no sponsor.

Background:

The NTTG Regional Economic Study Request window provides stakeholders with the opportunity to request NTTG to model the ability of specific upgrades or other investments to the Transmission System or Demand Resources, not otherwise considered in the Local Transmission Plans of the NTTG Transmission Providers, to reduce the overall cost of reliably serving the forecasted needs of the NTTG Footprint.

In Quarter 5 of the NTTG 2018-2019 Biennial Study cycle, Deseret Power on behalf of the "Joint Parties" (Utah Association of Energy Users, Deseret Power, Utah Municipal Power Agency, Utah Department of Commerce Office of Consumer Services and Utah Associated Municipal Power Systems) submitted an ESR to evaluate up to two 345 kV transmission lines as a lower cost alternative to Gateway West and Gateway South 500 kV transmission proposed in the draft Regional Transmission Plan (dRTP).

Joint Partiers Economic Study Request:

The Joint Parties request that a lower cost transmission alternative be studied, that reliably meets the projected 2028 loads and resources submitted by NTTG members for the NTTG footprint. With wind resource additions projected to cause transmission constraints in the Wyoming area, it is requested that a more targeted transmission solution consisting of 345 kV transmission line additions through the immediate congestion area be developed and evaluated as a lower cost alternative to Gateway West and Gateway South. Targeting the transmission additions through the congestion area and utilizing the existing 345 kV system voltage class (rather than introducing a higher cost 500 kV solution) may result in fewer transmission miles at a lower cost per mile when compared to the dFRTP.

This study request consists of evaluating up to two 345 kV transmission lines, independently originating in a logical location on the east side of the transmission constraint such as the Windstar or Aeolus area of Wyoming and independently terminating at a logical location on the west side of the constraint such as Bridger, Borah or Midpoint as needed to meet reliability criteria. Please identify the minimum amount of 345 kV line additions between these locations that are required to meet reliability criteria, including the use of any transformer additions that may be necessary.

It is also requested that this potential lower cost transmission alternative be evaluated under the scenarios that were studied as part of the Public Policy Considerations request, where additional resources are expected to be retired in the Wyoming area.

Link to the 2019-Q5 ESR: Joint Parties Economic Study Request

The Economic Study (ESR) assumed initially:

1. Two 345 kV circuits[1] between Aeolus and Anticline[2] (154 Miles),
2. A single 345 kV circuit from Anticline to Bridger
3. Two series compensated[3] 345 kV circuits between Anticline and Populus (203 Miles),
4. A single series compensated 345 kV circuit between Populus and Midpoint (153 Miles),
5. A single series compensated 345 kV circuit between Midpoint and Hemingway (130 miles),
6. With two Hemingway 345/500 kV transformers (700 MVA each).
7. Line shunt reactors to balance 90% the line charging of each circuit and bus shunt reactors for the remaining 10%.

Discussion

The Economic Study Request references the existing 345 kV system voltage class that already exists in Wyoming, hence, making the case that there is no need (yet) – to introduce higher cost 500 kV solution. To clarify, there is no existing 345 kV transmission east of Bridger in eastern Wyoming in the area of significant congestion.

The study tested the ESR configuration on all eight NTTG cases (A, B, C, E, F, G, H, I). Particular attention was focused on the Path C constraint, as mentioned above, the lack of the Aeolus to

[1] Assuming a bundled 1272 kcm H-frame construction.
[2] An alternate will consider using the Gateway West line at 500 kV already under construction and add second 345 kV.
[3] Compensation set to match the existing Bridger-Populus 345 kV lines.

Clover 500 kV line segment support caused increased stress across Path C. Additional analysis of the Path C constraint was found to be necessary.

The study performed the same contingencies as performed in the dRTP analysis, with additional contingencies added to the ESR configuration facilities. Additional N-2 outages were evaluated on the ESR facilities to determine which N-2 outages should be categorically avoided.

Power Flow Analysis

Performance of the ESR configuration was comparable in most of the NTTG cases with the exception of Case I which stressed Path C to its transfer capability.

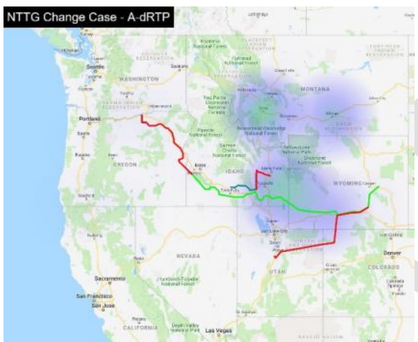

Figure 1 – Heavy Summer Case with dRTP configuration

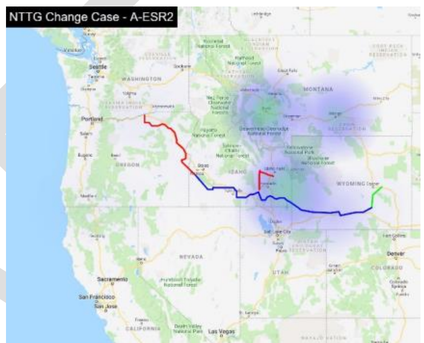

Figure 2 – Heavy Summer Case with ESR configuration

Figure 3 – Heavy Winter Case with dRTP configuration

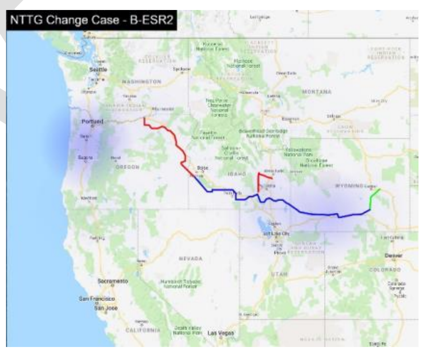

Figure 4 – Heavy Winter Case with ESR configuration

Figure 5 – High NW-ID Import Case with dRTP configuration

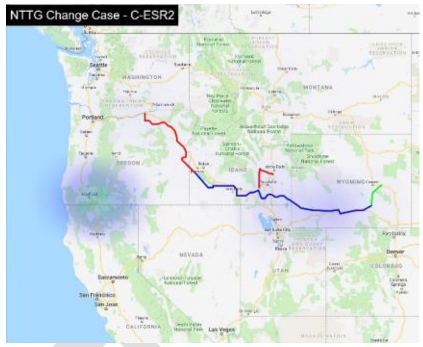

Figure 6 – High NW-ID Import Case with ESR configuration

Figure 7 – High Tot2/COI Case with dRTP configuration

Figure 8 – High Tot2/COI Case with ESR configuration

The highlighted violations in the ESR configuration are the result of slight post contingency overloads in the 138 kV Path C system.

Figure 9 – High Wyo Wind Case with dRTP configuration

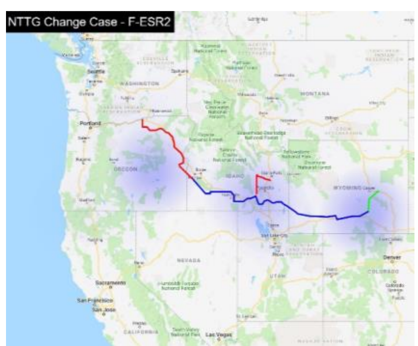

Figure 10 – High Wyo Wind Case with ESR configuration

Figure 11 – High Borah West Case with dRTP configuration

Figure 12 – High Borah West Case with ESR configuration

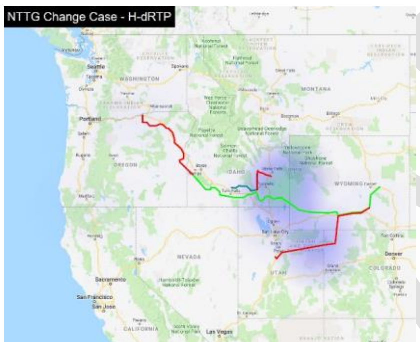

Figure 13 – High NTTG Import Case with dRTP configuration

Figure 14 – High NTTG import Case with ESR configuration

Figure 15 – High Aeolus West/South Case with dRTP configuration

Figure 16 – Heavy Aeolus West/South ~~Summer~~ Case with ESR configuration

The absence of the Aeolus – Clover 500 kV line connection to Utah resulted in increased flows across Path C up to the 2250 MW path capability. The highlighted violations in the ESR configuration are the result of post contingency overloads in the 138 kV Path C system similar to those that occur in Case E.

Production Cost Analysis

To determine the full costs from transmission expansion, consideration should also be given to system operating costs, annual electricity costs developed using production cost modeling (PCM). These costs, should then be added to the capital and or fixed costs for the resource and transmission added.

Using the WECC 2028 ADS PCM case, a PCM run was made comparing the two scenarios (dRTP and ESR, see Figure *17*~~Figure 17~~) hourly flows that result in increased incremental loading on Path C by 700 MW and up to 1000 MW (see Figure *18*~~Figure 18~~)for some hours and adds flow for select hours on other interconnected paths to Wyoming, loading through Montana north and to the northwest (paths 8, 18), including the COI\PDCI and on the east side, connections to WAPA and through Colorado on TOT 3 + TOT 5 and south as indicated in the charts below. With the dRTP, Path C flows occasionally exceeded 2000 MW and in the ESR configuration, Path C flow hits the 2250 MW path limit more often, causing a change in the economic dispatch.

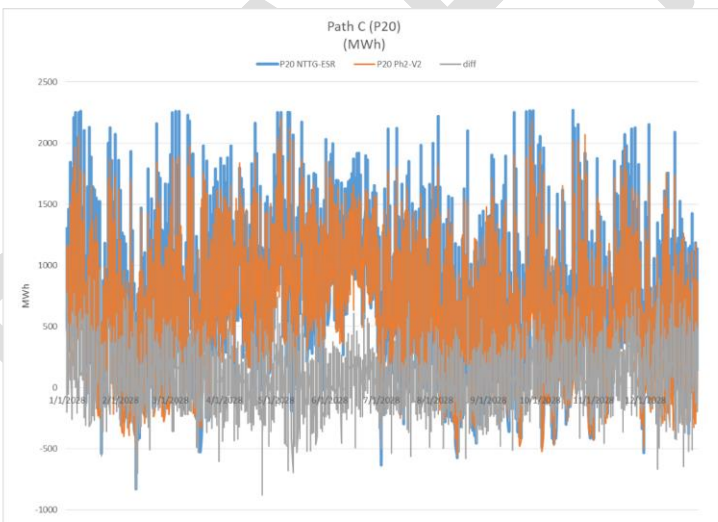

Figure 17 – PCM case Path C flows

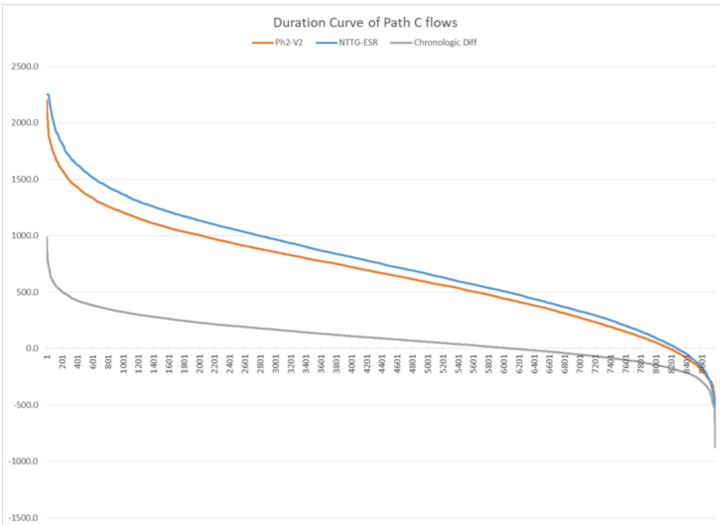

Figure 18 – Duration Curve of Path C flows[4]

Checking the other transmission ties connecting to Utah indicates resources south of Utah only contribute somewhat to the Aeolus to Clover 500 kV line removal, indicating that Path C limitations are resulting in increased flows through Colorado as well as increased Utah area generation dispatch.

[4] The Blue and Orange curves are non-coincident sorts of the Path C flow of the two cases. The Gray curve has taken the flow difference between the two cases for each hour and sorted that result.

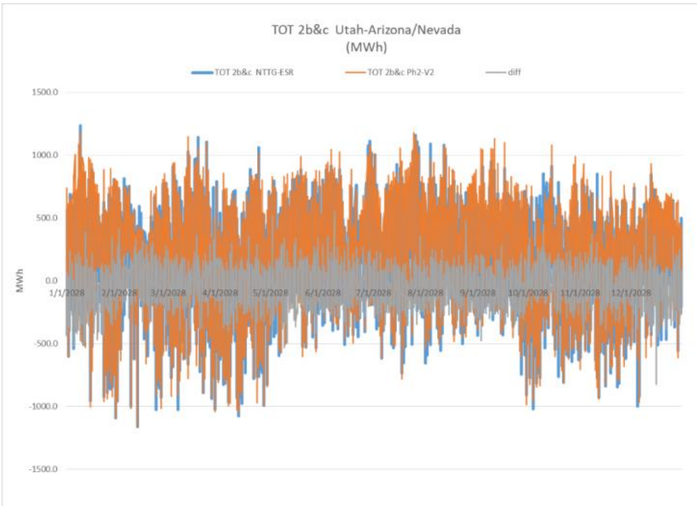

Figure 19 – PCM case Tot 2 b&c flows

The increased power flows through Colorado across the Tot 1a path are shown in Figure 20~~Figure 20~~. Flows west of Bonanza can be seen to increase demonstrating that system flow increases through Colorado and Eastern Utah in the ESR configuration when compared to the dRTP, as shown in Figure 21~~Figure 21~~.

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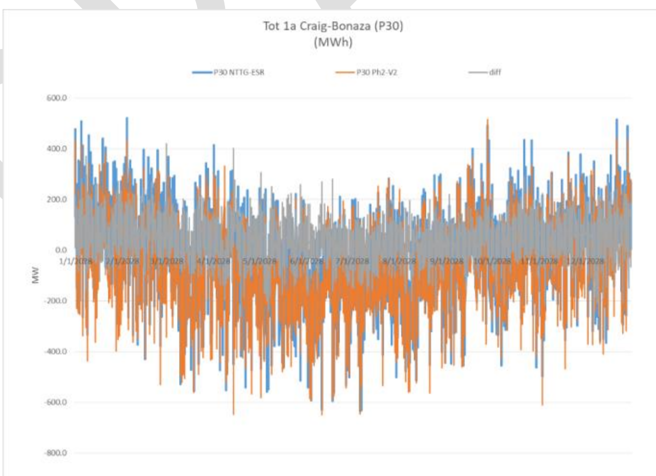

Figure 20 – PCM case Tot 1a flows

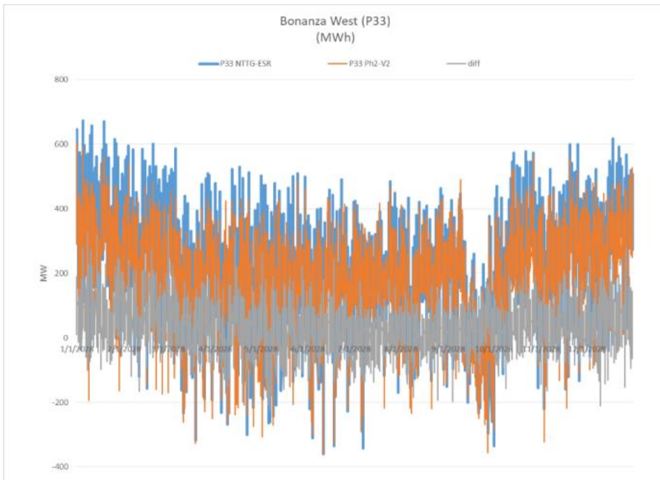

Figure 21 – PCM case West of Bonanza flows

Figure 22 – PCM case Tot 3 Wyoming-Colorado flows

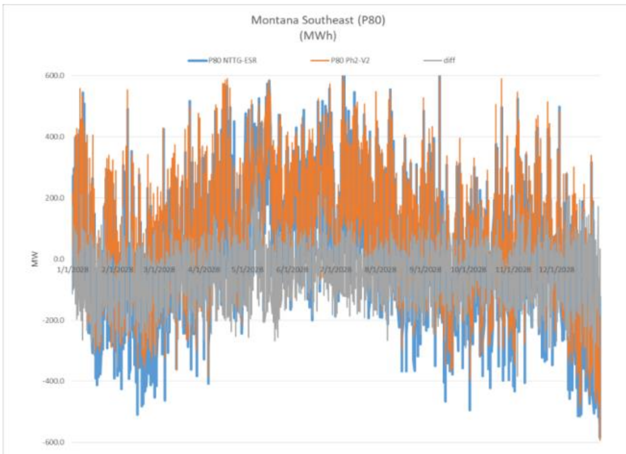

Figure 23 – PCM case Montana Southeast flows[5]

Checking paths with increased congestion costs, the PCM results indicate that resources in Wyoming are subject to increased congestion. Most significantly, congestion costs almost double in the ESR configuration on the ties into Colorado from Dave Johnston when compared to the already congested amount in the dRTP configuration. Similarly, flows also increase to the north into Montana and across to the Pacific Northwest, continuing south on PDCI.

Total Congestion Cost ($)	dRTP	ESR	diff
P08 Montana to Northwest	498,056	932,607	434,552
P18 Montana-Idaho	14,890	28,654	13,764
P20 Path C	-	568,026	568,026
P32 Pavant-Gonder InterMtn-Gonder 230 kV	2,524,955	2,936,094	411,139
P36 TOT 3	3,920,847	6,860,597	2,939,750
P39 TOT 5	-	142,631	142,631
P65 Pacific DC Intertie (PDCI)	-	145,014	145,014
P66 COI	10,672	3,412	(7,260)
P75 Hemingway-Summer Lake	6,622,456	5,821,117	(801,339)
P80 Montana Southeast	47,212	210,098	162,886
P83 Montana Alberta Tie Line	49,338,336	53,604,504	4,266,168
South of Custer	2,409,188	3,745,993	1,336,805
W27_BS_PACE__RM_WACM_1	9,430,535	10,050,967	620,432
W17_NW_NWMT+__RM_WACM_1	2,119,987	2,243,588	123,602
Total			10,356,169

Table 1 – Selected PCM case NTTG ties increased Congestion costs

[5] Montana Southeast path direction southbound

The total change in PCM dispatch costs for the NTTG footprint is shown in Table 2~~Table 2~~ below. It should be noted that fixed dispatch and hydro resources are not included in this tabulation, as those resources are included at zero cost in the PCM model.

Operating Costs (2018$)	***2028ADS_Ph2-V2.0 dRTP***	***2028ADS_Ph2-V2 ESR***	***Diff (ESR-dRTP)***
IPFE	$13,311,231	$13,078,921	$(232,310)
IPMV	$38,234,276	$37,798,816	$(435,460)
IPTV	$127,704,080	$130,410,392	$2,706,312
NWMT	$81,126,576	$82,660,440	$1,533,864
PACW	$339,970,528	$340,844,736	$874,208
PAID	$70,948,592	$70,958,600	$10,008
PAUT	$617,476,672	$624,573,312	$7,096,640
PAWY	$102,819,872	$101,039,432	$(1,780,440)
PGE	$238,849,920	$246,217,840	$7,367,920
NTTG Total	**$1,630,441,747**	**$1,647,582,489**	**$17,140,742**

Table 2 – Change in NTTG thermal operating Costs between dRTP and ESR cases

Changes in the network flows resulting from the ESR configuration cause increased dump energy in the NTTG footprint as shown in *Table 3*~~Table 3~~.

(MWh)	**dPRT**	**ESR**	**Diff (ESR - dPRT)**
IPFE	-	-	
IPMV	-	-	
IPTV	-	-	
NWMT	70,466	84,631	14,165
PACW	89,316	89,399	83
PAID	795	1	-794
PAUT	-	5	
PAWY	1,674	7,321	**5,647**
PGE	31,302	33,576	2,274
Total	**193,552**	**214,933**	**21,381**

Table 3 – Change in NTTG dump energy between dRTP and ESR cases

Accounting for the increased transmission flows entering\exiting PACE as a result of the ESR decreased transmission capacity is warranted. Although within their transmission ratings, PacifiCorp has no existing firm contractual arrangements on transmission lines\paths listed in the *Table 4*~~Table 4~~ to serve PacifiCorp network loads. Consistent with operating practices, PacifiCorp would drop "bottled" energy[6] and limit congestion as necessary in pursuit of the economic dispatch. Hence, the aggregate energy summarized on transmission lines\paths below were used to calculate what could be characterized as

[6] The term "Bottled Energy" is use to represent the additional energy crossing the transmission network that would require additional firm transmission rights and is assumed to not likely available. Without those transmission rights, the energy would have to be dumped.

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Commented [RDS1]: Duplicate Table removed "bottled energy" cost; this is essentially the PacifiCorp energy not finding its way out plus the non-contracted flows circulating to serve PacifiCorp's network loads.

(MWh)	P08 MT-NW	Tot 2 (2b1+2b2 +2c)	P32 Pavant-Gonder	P28, IPP-Mona	P36, Tot 3	P30, Tot 1A	Wyo Spill	Total
Bottled Energy	939,192	241,702	80,679	634,505	694,360	472,876	21,381	3,084,695

Table 4 – *Bottled Energy, connecting to PACE and PACW power system*

Calculating the Annual Bottled Energy Costs (assuming a $23.13/MWh Utah Average clearing cost from the PCM model):

3,084,695 MWh x $23.13/MWh = $71.3 million

P-V & Q-V analysis

Considering that a large portion of the Utah generation south of Path C is from coal (over 2900 MW) and assuming that those coal resources will be retiring beyond the 10 year study timeframe, it is possible that the Utah system will see increased constraints with the ESR configuration compared to the dRTP. Replacing those coal resources with renewable wind and solar resources will likely be the preference. While there are proven solar resource opportunities in southern Utah, access to the Wyoming wind resources or resources north of Path C will be limited, forcing selections elsewhere. The ESR configuration could result in dispatch changes with increased must run resources within the state of Utah, potentially adding yearly cost to the overall cost of the transmission upgrades proposed in the ESR.

Other paths including COI, PDCI and the AB32 also exhibit increased congestion costs indicating that the dRTP provides benefit outside the NTTG Footprint compared to the ESR configuration.

While the ESR configuration showed acceptable performance in the selected power flow hours considered, the overall capability of the ESR configuration is less than the dRTP. For example, outages in the Wyoming 345 kV segments for some of the stressed condition scenarios resulted in the remaining system to be at its thermal capacity, indicating the ESR configuration is at its capability while the 500 kV dRTP configuration[7] has further capability beyond the conditions studied.

Power vs Voltage (P-V) and Var vs Voltage (Q-V) analysis was performed on Case I which had Path C loaded to 2214 MW in the ESR configuration. The Q-V analysis shown in Figure 24Figure 24 confirms that at the flow levels in the modified ESR Case I, there is adequate reactive margin for the critical N-2 contingencies. The P-V analysis shown in Figure 25Figure 25 suggests that the ESR configuration is significantly less capable of servicing future Utah loads. Voltages of the dRTP

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[7] Due to the increased operating voltage and an additional conductor necessary to mitigate radio noise and corona issues operating at 500 kV.

configuration with an additional 1200 MW schedule exceed that of the ESR configuration with only a 400 MW additional schedule.

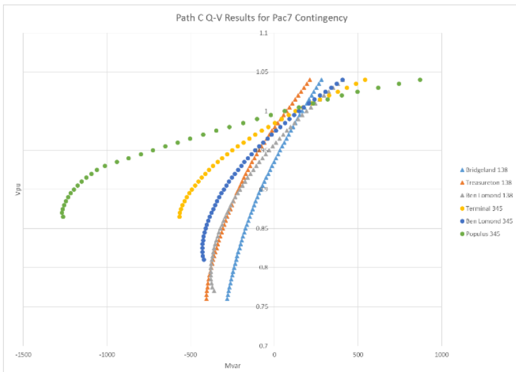

Figure 24 – Q-V curves for ESR2 configuration on Case I

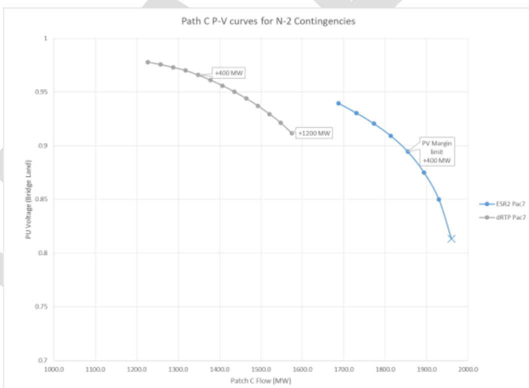

Figure 25 – P-V curve for dRTP and ESR2 configurations on Case I

To mitigate Path C overload concerns, an additional 345 kV circuit between Populus and Terminal was contemplated, however, transmission corridor restrictions around Willard Bay, north of Ogden, Utah likely will prohibit its construction (see further discussion of the corridor in Attachment B), effectively limiting the Path C cut-plane to 2250 MW for the foreseeable future.

Public Policy Consideration (PPC) Sensitivity

A sensitivity run with the PPC resource scenarios (additional wind in Wyoming replacing retired coal units at Bridger and Naughton, Utah Wind and Pacific Northwest) and only one 345 kV circuit between Anticline and Populus, found that the Path C constraint becomes more stressed with increased Path C overloads and low voltages than the dRTP configuration.

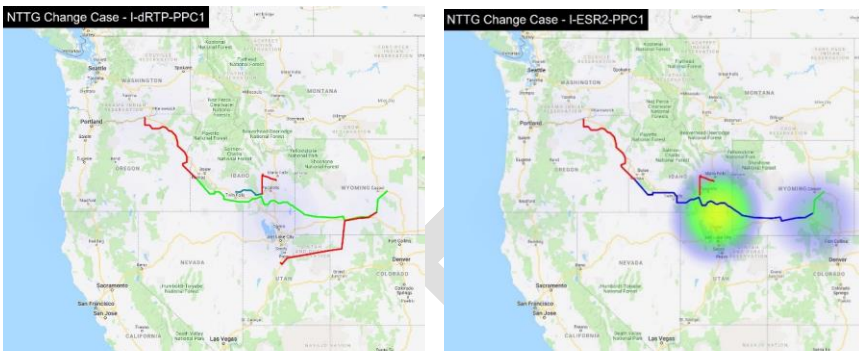

Figure 26 and 27 – PPC Scenario 1 (Wyo Wind) applied to Case I dRTP/ESR configurations

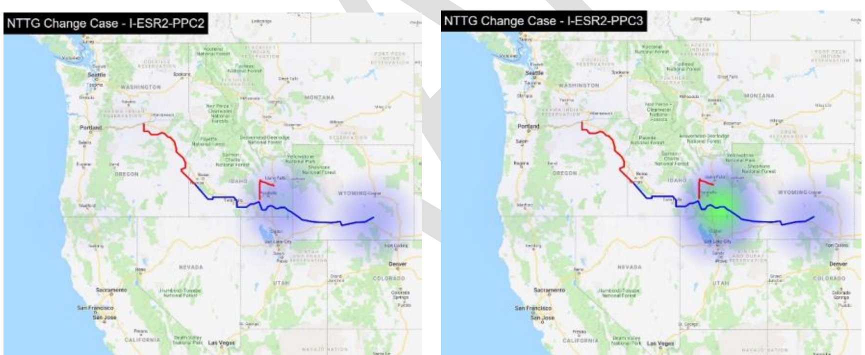

Figure 28 and 29 – PPC Scenario 2 (Utah Wind) and Scenario 3 (Northwest) applied to Case I

The ESR N-2 contingencies indicated that loss of both Aeolus to Anticline circuits should be avoided. Loss of both circuits would likely lead to cascading performance. Separate ROWs would be required to consider this contingency not credible.

Cost & Benefit Analysis

Capital Cost of the final configuration including the facilities listed at the top of page two, was calculated to be $2,601,920,914 compared to $4,525,329,044 for the Gateway West and South portions of the dRTP configuration[8].

Segment	Miles	Cost/mile	Cost
Wyoming 230 kV Line Segments	147	981,246	144,635,610
Aeolus – Anticline #1	154	2,154,692	331,844,061
Aeolus – Anticline #2	154	2,154,692	331,844,061
Anticline – Bridger	5	2,127,863	10,639,314
Anticline – Populus #1[9]	203	2,358,823	478,841,071
Anticline – Populus #2	203	2,358,823	478,841,070
Populus – Midpoint	152	2,292,848	348,512,922
Midpoint – Hemingway	126	2,001,499	263,197,134
Total	794		2,388,355,243

Table 5 – Capital Cost Summary of ESR Configuration Transmission Lines

Substation	Cost
Windstar, DJ, Heward 230 kV	20,369,890
Aeolus	52,848,571
Anticline	24,596,296
Bridger	4,364,976
Populus	44,438,329
Midpoint	19,759,439
Hemingway	47,188,170
Total	213,565,671

Table 6 – Capital Cost Summary of ESR Configuration Substation Additions

Using the NTTG levelized annual Cost calculator[10], the ESR configuration would result in an annualized construction cost savings of $270,502,236~~395,925,199~~.

[8] Includes 230 kV Wyoming improvements and excludes B2H Project capital costs. If the two Anticline to Populus circuits were built on a double circuit structure, the total cost is estimated to be $2,410,453,404.

[9] If Anticline to Populus was built as a double circuit, the segment would cost $766,214,631 at $3,774,456 per mile. For the conditions studied, a double circuit performed acceptably, however, a double circuit configuration by its very nature has less capability than a two independent circuit configuration.

[10] The NTTG Annualized cost calculator uses a 40 Year economic life for the facilities, 2.5% fixed O&M cost rate with a 2.5% O&M cost escalator, 1% property tax and 0.5% for insurance in the ongoing cost calculation. Financing Costs assume a 50/50 split between equity and debt with a debt rate of 6.0% and the cost of equity at 11%, resulting in a 8.5% weighted cost of capital. Financing costs of PacifiCorp are not reflected in these assumptions.

Due to the change in dispatch, a loss change comparison is less than intuitive, NTTG footprint losses actually drop slightly as shown in Table 7~~Table 7~~, due to increased local generation dispatch in response to congested paths.

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Scenarios	2028 ADS PCM Ph2 - V2			2028 ADS PCM Ph2-V2_NTTG-ESR		
Area	Total Generation (MWh)	Served Load Includes Losses (MWh)	Estimated Losses (MWh)	Total Generation (MWh)	Served Load Includes Losses (MWh)	Estimated Losses (MWh)
IPFE	1,306,997	2,643,038	61,726	1,294,316	2,643,030	61,381
IPMV	4,259,555	5,729,208	141,942	4,239,286	5,729,188	141,148
IPTV	11,982,161	11,895,701	340,477	12,053,989	11,895,633	338,571
NWMT	12,917,237	12,059,774	86,939	12,976,891	12,059,701	86,452
PACW	20,473,372	22,034,952	545,501	20,444,353	22,034,861	542,447
PAID	6,866,373	6,331,344	133,686	6,867,434	6,331,320	132,939
PAUT	32,795,381	35,788,920	925,570	33,073,996	35,788,699	920,391
PAWY	17,305,782	10,754,518	214,625	17,201,309	10,754,504	213,424
PGE	15,758,254	21,852,634	616,719	16,025,738	21,852,494	613,268
NTTG Total	*123,665,112*	*129,090,089*	*3,067,183*	*124,177,311*	*129,089,430*	*3,050,020*

Table 7 – MWh Change in Generation, Load and Losses
between the dRTP and ESR configurations

Conclusion

An annualized cost savings of $~~365,925,000~~270,502,236 is estimated by the ESR configuration compared to the dRTP configuration. At the same time an additional cost of $88,440,000[11] ~~will~~ can be incurred as the variable generation operating and maintenance (VO&M) cost in the ESR as compared to the dRTP. Additional consideration, however, should be given to other factors, such as:

1. PCM simulations indicate additional power flow stresses for select hours on various paths within the Western Interconnect, and more so to immediate transmission connected to the NTTG footprint.

2. Lower cost of dumped energy from Wyoming wind that is replaced by higher cost increased energy, using thermal resources in Idaho and Utah (assuming no additional solar or wind resources in Utah).

3. Some resources may have to be designated as must-run resources in order to reliably serve the load for select hours of the year based on PCM simulations and assuming no additional Path C facilities.

4. The 500 kV design provides additional system robustness and reduces stress across Path C.

Gateway West and Gateway South 500 kV transmission lines have established transmission capability through a rigorous Western Electricity Coordinating Council's Path Rating Process. The transmission upgrades proposed in the ESR do not have an established transmission capability. The

[11] $71,300,00 in bottled energy and $17,140,000 in increased VO&M costs

backup support provided by Gateway South cannot be achieved with the 345 kV circuit configuration. Ultimately, the 345 kV transmission option does not provide the full support expected from Gateway West and South 500 kV lines.

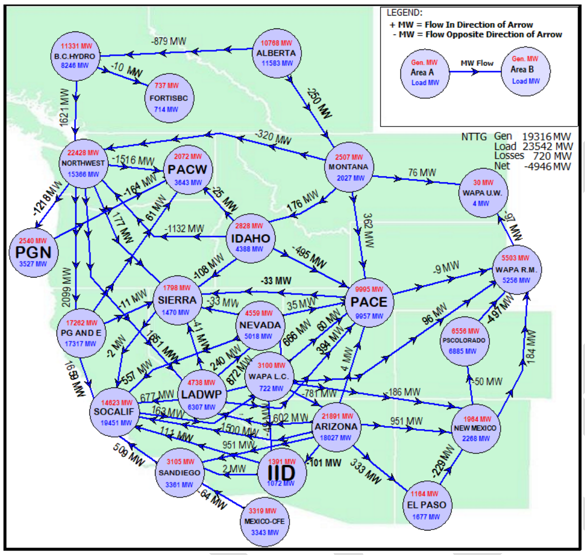
Many assumptions have been made that this ESR configuration would be constructible by 2028. It has taken since the early 2010's, to establish the necessary permits to allow construction of the many segments of the Gateway Projects. The first Gateway West segment is planned to be in-service in 2020. In some cases, acquiring the necessary permits for this ESR configuration could take another 12 to 15 years.

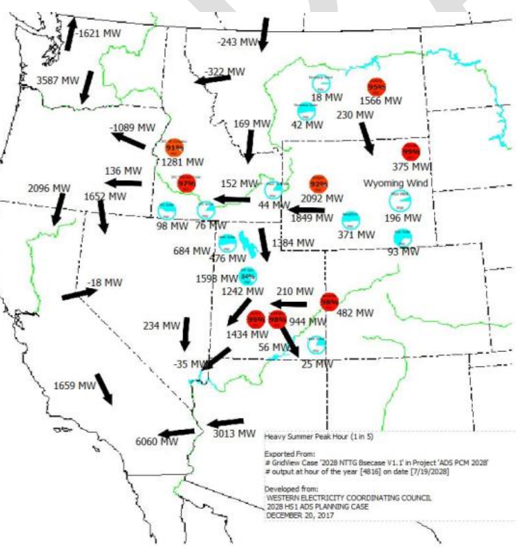
This ESR configuration has been only cursorily reviewed and considered the performance under 1 in 2 typical conditions. Many additional studies would need to be performed studying the normal boundary conditions considered in transmission planning studies.

Attachment – A

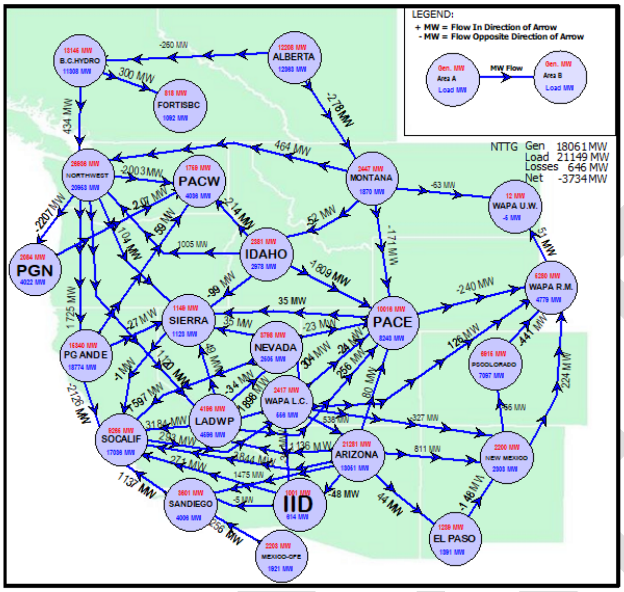
Revised Powerflow Cases

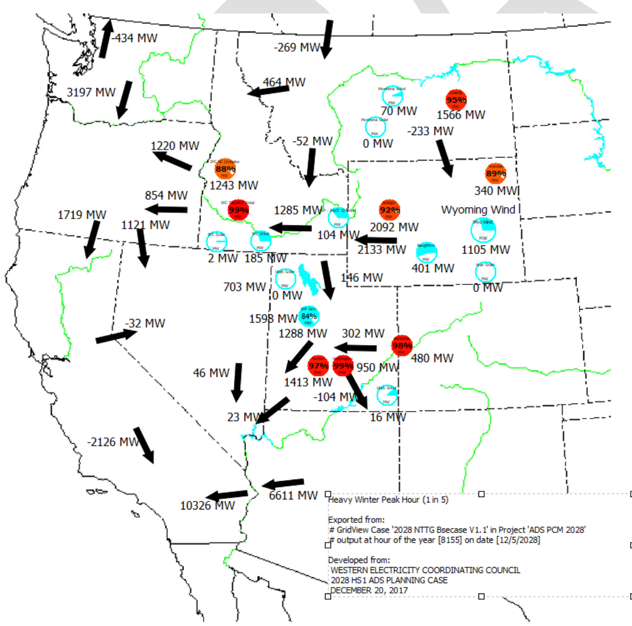
Case A – Heavy Summer



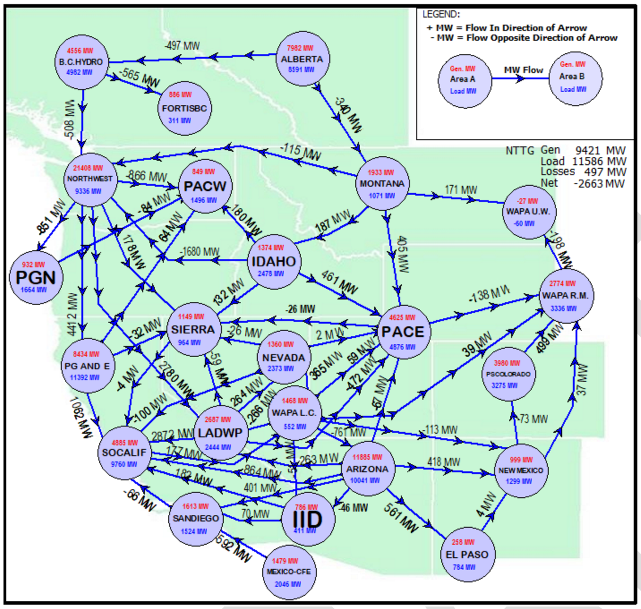


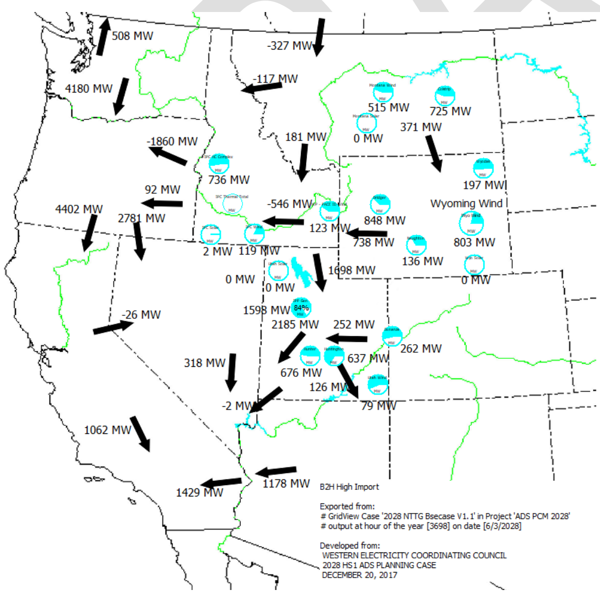
Case B – Heavy Winter



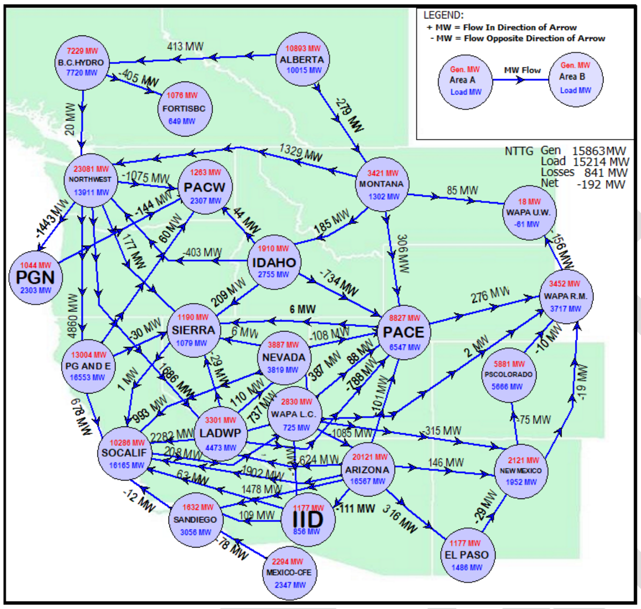


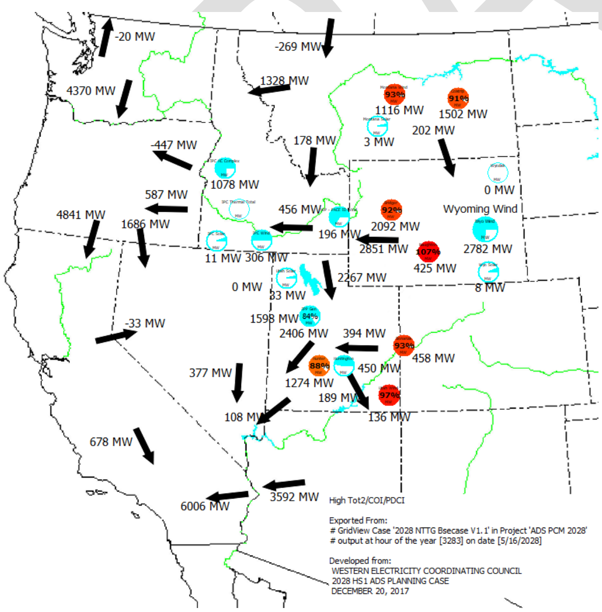
Case C – High ID-NW Import



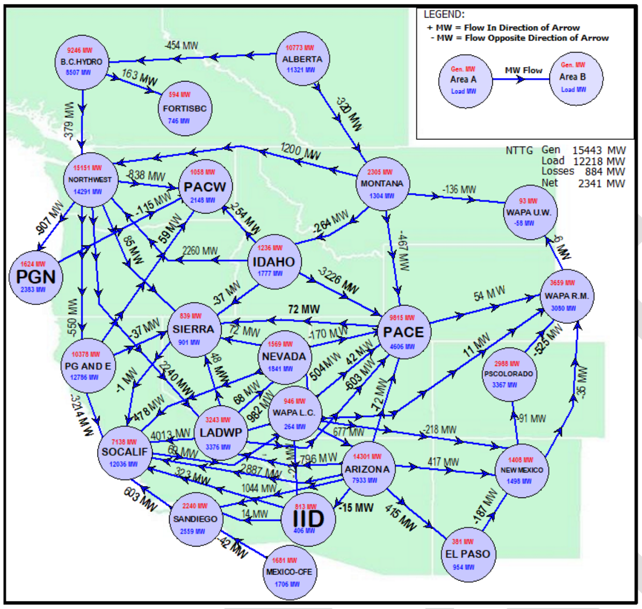


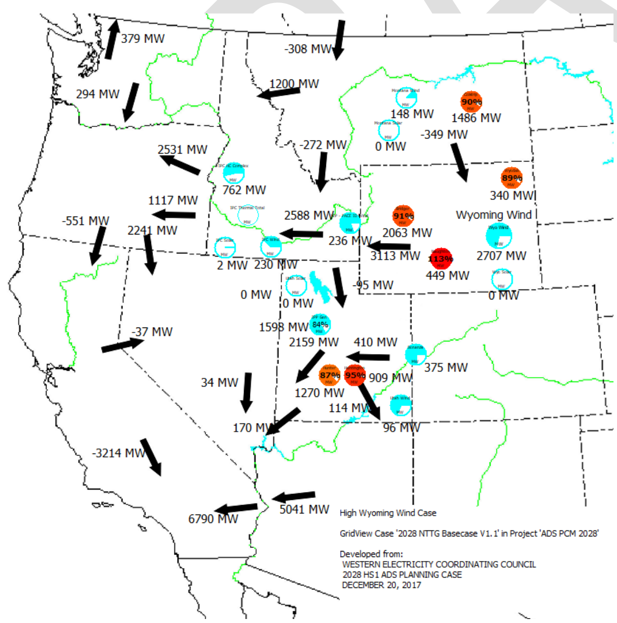
Case E – High Tot2/COI



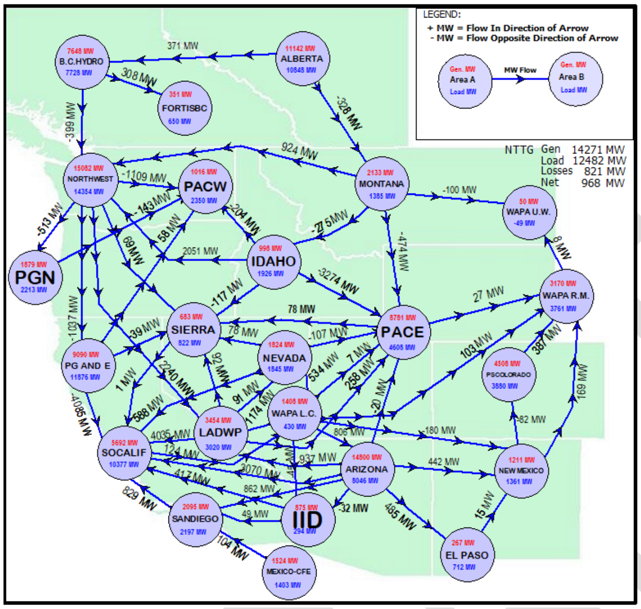


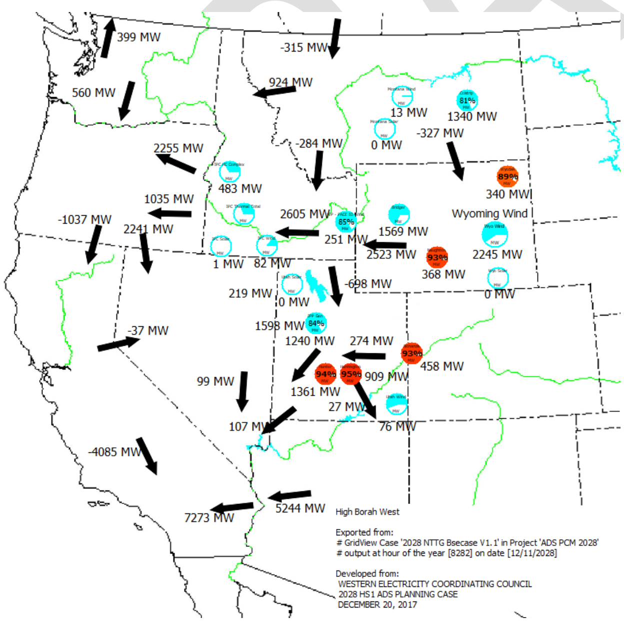
Case F – High Wyoming Wind



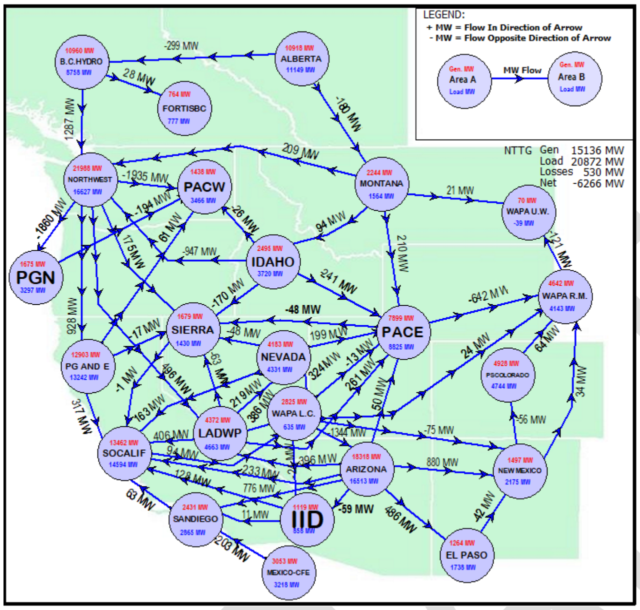


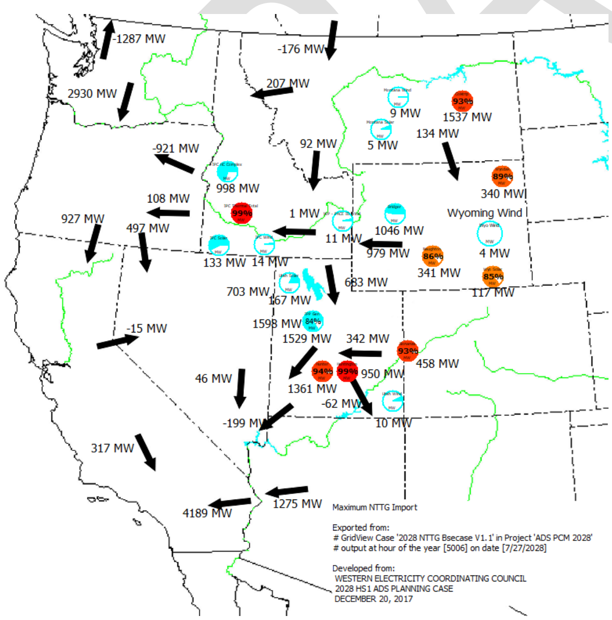
Case G – High Borah West



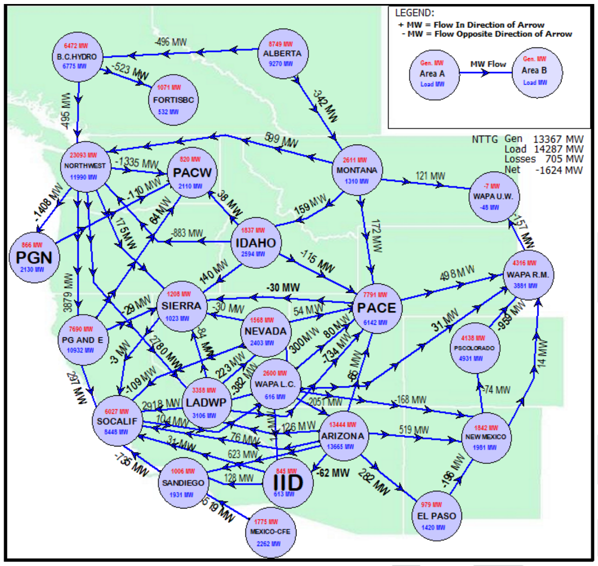


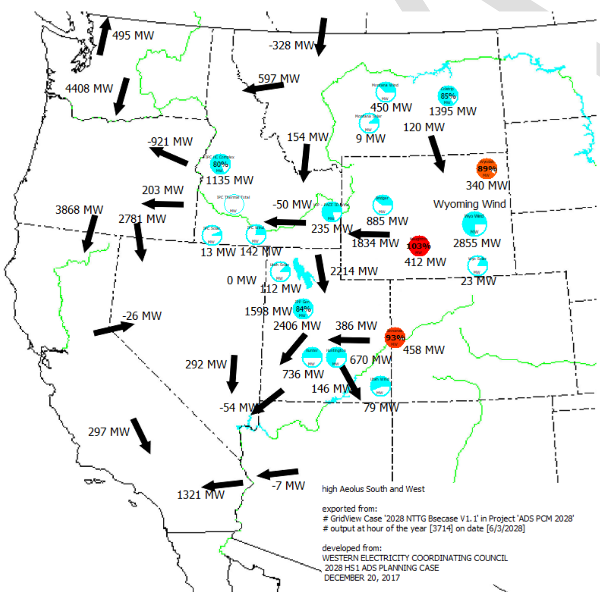
Case H – Low Wyoming Wind



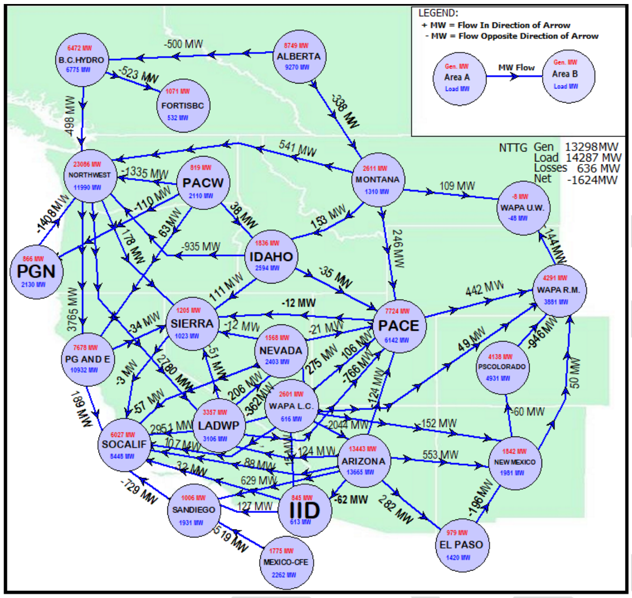


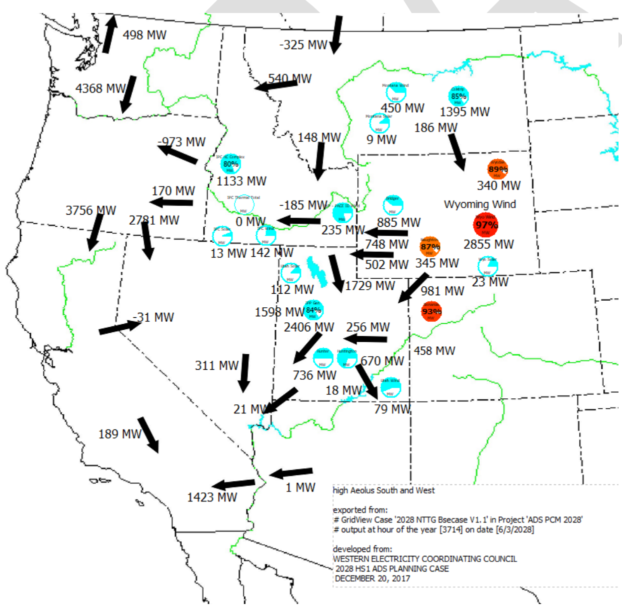
Case I – High Aeolus West and South – ESR Configuration





Case I – dRTP Configuration



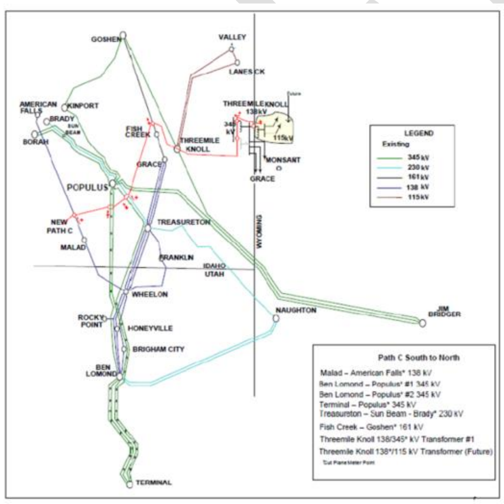


Attachment – B

Path C Corridor Constraints

PacifiCorp has previously indicated that an additional transmission corridor south of Populus is not a viable transmission solution. During efforts to complete the Populus – Terminal 345 kV Project in 2010, PacifiCorp utilized all available EHV transmission corridors between southeast Idaho and northern Utah. To aid in the discussion, we have included a single-line of the southeast Idaho to northern Utah transmission system, below.

The most significant "pinch-point" in Path C is just north of Ben Lomond near Willard Bay. In this section there is a four mile-line section of line, which is constructed on top of the Willard Bay dyke. At one point in the corridor the width between the Willard Bay dyke and Mount Ben Lomond is less than one mile. In this narrow area, is a single-circuit 345 kV, double-circuit 345 kV, three 138 kV lines, Interstate 15, double-track Union Pacific Rail road, homes and businesses.



While the current single-circuit 345 kV transmission structures have been constructed on the dyke, the structures are not designed for double-circuit and would need to be replaced. It is anticipated that Weber Basin Water Conservancy District, who operated Willard Bay for irrigation will not allow new structures to be constructed on top of the Willard Bay dyke – due to risk to an aging dyke, and risk of triggering federal government oversite to the worthiness of the entire dyke to meet current national standards.

Additionally, constructing a new line south of Ben Lomond to Terminal would require the condemnation of 60 to possibly over 100 homes and businesses.