

NTTG 2018-2019 Quarter 5 Stakeholder Meeting

Portland, OR
April 18, 2019



NTTG 2018-2019 Planning Cycle

Q5 Milestones

Q1-Q4
2018

Q1
Regional
Transmission
Plan Data
Gathering
and Economic
Study Request
Window

Q2
Study Plan
Development
and Approval

Q3-Q4
Run Studies

Q4
Draft Regional
Transmission
Plan and
Economic
Study Results

Q5-Q8
2019

Q5
Stakeholder
Review, Data
Updates &
Economic
Study Request
Window

Q6
Cost
Allocation,
Draft Final
Regional
Transmission
Plan (DFRTP)

Q7
DFRTP
Review

Q8
Project Sponsor
Pre-qualification
for Next Cycle

Regional Transmission
Plan Approval and
Economic Study Results



NTTG Q5 Stakeholder Meeting

Agenda

10:00 – 10:10	WELCOME AND AGENDA REVIEW
	2018-2019 DRAFT REGIONAL TRANSMISSION PLAN (DRTP)
10:10 – 11:15	<ul style="list-style-type: none">• NTTG DRTP Overview• Stakeholder Comments on the Plan and NTTG's Response• Modifications to the NTTG Draft Regional Plan
11:15 – 11:35	<ul style="list-style-type: none">• Public Policy Consideration Study• Q5 Updated Data Submittals
11:35 – 11:40	<ul style="list-style-type: none">• Upcoming opportunities for stakeholder input
11:40 – 11:55	NEIGHBORING PLANNING REGION UPDATES
11:55 – 12:00	STAKEHOLDER COMMENTS/OTHER BUSINESS
12:00	ADJOURN

2018-2019 Draft Regional Transmission Plan Overview

Presented by Chelsea Loomis,
NTTG Planning Committee Chair



NTTG Regional Transmission Plan Evaluation

- NTTG's goal is to select the more efficient or cost effect set of projects to meet the footprints needs
- Regional projects were selected through
 - Reliability analysis (power flow) and
 - Benefit determination (changes in capital costs, losses, and reserves)
- Analysis performed on
 - Initial Regional Transmission Plan (IRTP)
 - IRTP without uncommitted projects
 - Evaluation of Alternative Projects



TWG Case Terminology

- Null – all iRTP facilities excluded
- pRTP – Prior Regional Transmission Plan, includes:
 - B2H, McNary-Wallula, Gateway West (less Populus-Borah, Cedar Hill-Midpoint and Midpoint-Hemingway), Gateway South and Antelope Projects
 - Un-committed Bulk Electric System facilities outside the NTTG footprint
- iRTP – Initial Regional Transmission Plan, includes:
 - B2H, McNary-Wallula, Gateway West, Gateway South, Antelope Projects, local load serving projects
 - Un-committed BES facilities outside the NTTG footprint



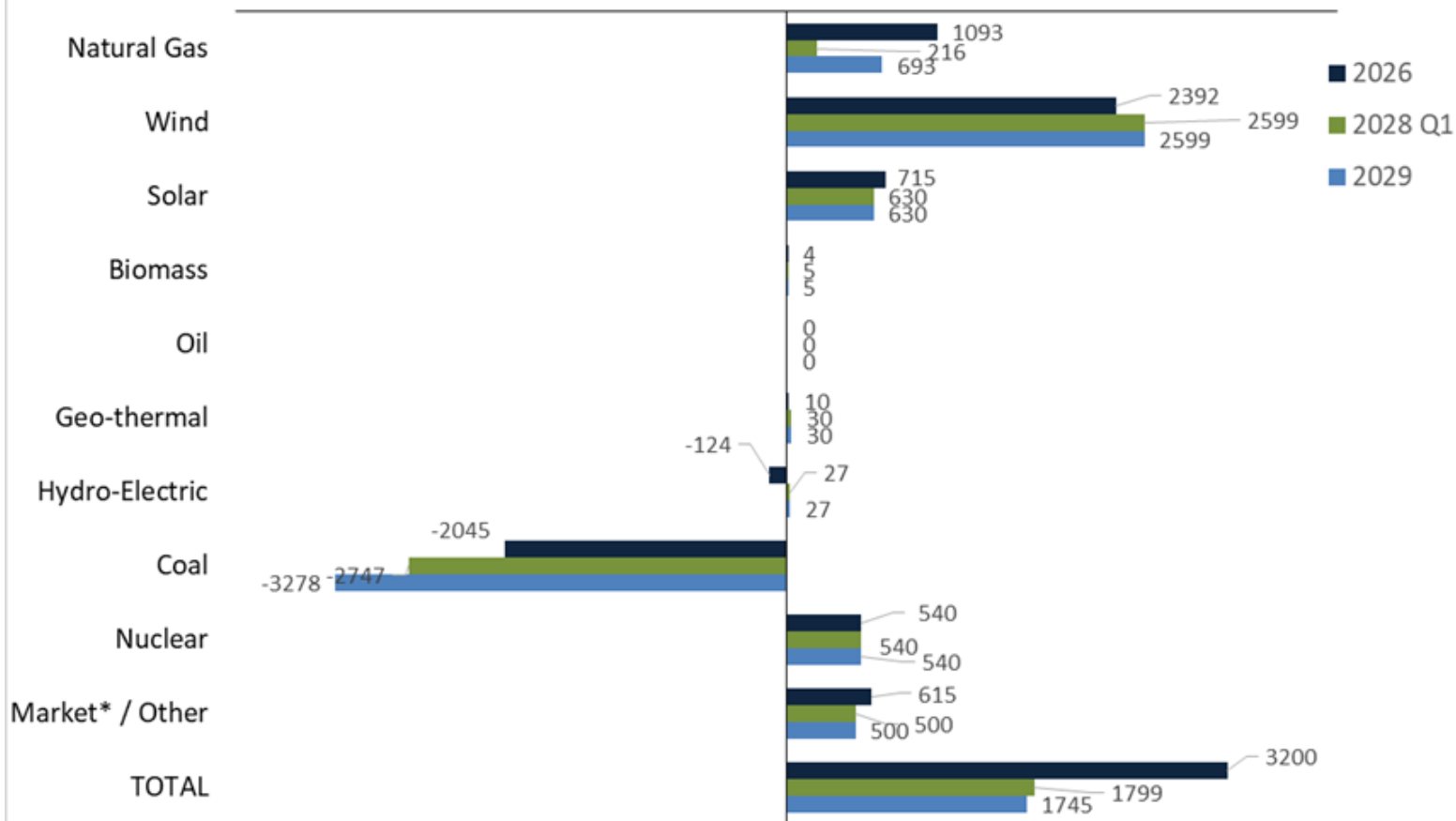
Quarter 1 Load Submittal

SUBMITTED BY:	2017 Actual Peak Demand (MW)	2026 Summer Load Data Submitted in 2016-17 (MW)	2028 Summer Load Data Submitted in Q1 2018 (MW)	Difference (MW) 2026- 2028
Idaho Power	3,806	4,346	4,412	66
NorthWestern	1,803	1,992	2,027	35
PacifiCorp	12,634**	13,044	13,386	342
Portland General	4023	3,885	3,928	43
TOTAL*	22,266	23,267	23,753	486
* Loads for Deseret G&T and UAMPS are included in PacifiCorp East				
** 2016 July Peak Demand				



Quarter 1 Resource Submittal

Comparison of Forecasted Resources (MW)





Quarter 1 Resource Submittal

State	Resource Additions (MW)
Arizona ¹	-414
California	0
Colorado ¹⁰	-82
Idaho	588
Montana	573
Oregon	-391
Utah	452
Washington	108
Wyoming	727 ²



Quarter 1 Coal Retirements

Coal Unit	Retirement Date	Study Treatment
Naughton 3	12/2018	Retired
Valmy 1	12/2019	Retired
Boardman	12/2020	Retired
Cholla 4 ⁴	12/2020	Retired
Colstrip 1 & 2	7/2022	Retired
Valmy 2	12/2025	Retired
Craig 1 ⁴	12/2025	Retired
Dave Johnson 1, 2, 3, 4	12/2027	Retired
Bridger 1	12/2028	On-line, Retired in Sensitivity case

¹ Units are assumed to retire at the end of the stated month.



Q1 Transmission Additions

Submitter	From	To	Voltage	Circuit	Type	Regionally Significant ¹	Committed	Projects (In-service Year)
Idaho Power	Hemingway	Longhorn	500 kV	1	LTP & pRTP	Yes	No	B2H Project (2026)
	Hemingway	Bowmont	230 kV	2	LTP	Yes	No	New Line - associated with Boardman to Hemingway (2026)
	Bowmont	Hubbard	230 kV	1	LTP	Yes	No	New Line - associated with Boardman to Hemingway (2026)
	Hubbard	Cloverdale	230 kV	1	LTP	No	No	New Line (2021)
	Midpoint	Hemingway	500 kV	2	LTP	Yes	No	Gateway West Segment #8 (joint with PacifiCorp East) (2024)
	Cedar Hill	Hemingway	500 kV	1	LTP & pRTP	Yes	No	Gateway West Segment #9 (joint with PacifiCorp East) (2024)
	Cedar Hill	Midpoint	500 kV	1	LTP	Yes	No	Gateway West Segment #10 (2024)
	Midpoint	Borah	500 kV	1	LTP	Yes	No	(convert existing from 345 kV operation) (2024)
	Ketchum	Wood River	138 kV	2	LTP	No	No	New Line (2020)
Enbridge	Willis	Star	138 kV	1	LTP	No	No	New Line (2019)
	SE Alberta		DC	1	LTP	Yes	No	MATL 600 MW Back to Back DC Converter (2024)
PacifiCorp East	Aeolus	Clover	500 kV	1	LTP & pRTP	Yes	No	Gateway South Project – Segment #2 (2024)
	Aeolus	Anticline	500 kV	1	LTP & pRTP	Yes	No	Gateway West Segments 2&3 (2020)
	Anticline	Jim Bridger	500 kV	1	LTP & pRTP	Yes	No	345/500 kV Tie (2020)
	Anticline	Populus	500 kV	1	LTP & pRTP	Yes	No	Gateway West Segment #4 (2024)
	Populus	Borah	500 kV	1	LTP	Yes	No	Gateway West Segment #5 (2024)
	Populus	Cedar Hill	500 kV	1	LTP & pRTP	Yes	No	Gateway West Segment #7 (2024)
	Antelope	Goshen	345 kV	1	LTP	Yes	No	Nuclear Resource Integration (2026)
	Antelope	Borah	345 kV	1	LTP	Yes	No	Nuclear Resource Integration (2026)
	Windstar	Aeolus	230 kV	1	LTP & pRTP	Yes	No	Gateway West Segment #1W (2024)
	Oquirrh	Terminal	345 kV	2	LTP	Yes	Yes	Gateway Central
PacifiCorp West	Cedar Hill	Hemingway	500 kV	1	LTP	Yes	No	Gateway West Segment #9 (joint with Idaho Power) (2024)
	Shirley Basin	Standpipe	230 kV	1	LTP	Yes	No	Local Wind Integration (2020)
PacifiCorp West	Wallula	McNary	230 kV	2	LTP	Yes	Yes	Gateway West Segment A (2020)
Portland General	Blue Lake	Gresham	230 kV	1	LTP	No	Yes	New Line (2018)
	Blue Lake	Troutdale	230 kV	1	LTP	No	Yes	Rebuild (2018)
	Blue Lake	Troutdale	230 kV	2	LTP	No	Yes	New Line (2018)
	Horizon	Springville Jct	230 kV	1	LTP	No	Yes	New Line (Trojan-St Marys-Horizon) (2020)
	Horizon	Harborton	230 kV	1	LTP	No	Yes	New Line (re-terminates Horizon Line) (2020)
	Trojan	Harborton	230 kV	1	LTP	No	Yes	Re-termination to Harborton (2020)
	St Marys	Harborton	230 kV	1	LTP	No	Yes	Re-termination to Harborton (2020)
	Rivergate	Harborton	230 kV	1	LTP	No	Yes	Re-termination to Harborton (2020)
	Trojan	Harborton	230 kV	2	LTP	No	Yes	Re-termination to Harborton (2020)
			115 kV	1	LTP	No	Yes	Various Load Service Additions (2019-2024)



Q1 Interregional Transmission Projects

SUMMARY OF Q1-2018 INTERREGIONAL PROJECTS SUBMITTED TO NTTG						
Project Name	Company	Relevant Planning Region(s)	Termination From	Termination to	Status	In Service Date
Cross-Tie Transmission Project	TransCanyon, LLC	NTTG, WestConnect	Clover, UT	Robinson Summit, NV	Conceptual	2024
SWIP-North	Great Basin Transmission LLC	CAISO ¹ , NTTG, WestConnect	Midpoint, ID	Robinson Summit, NV	Permitted	2021
TransWest Express Transmission DC/AC Project ¹⁸	TransWest Express, LLC	CAISO, NTTG, WestConnect	Rawlins, WY	Boulder City, NV	Conceptual	2022
TransWest Express Transmission DC Project	TransWest Express, LLC	CAISO, NTTG, WestConnect	Rawlins, WY	Boulder City, NV	Conceptual	2022

¹The California ISO has voluntarily agreed to study the SWIP-N line and accept cost allocation if the project is found to be needed by the California ISO and is ultimately constructed.



Public Policy Requirements

- Local transmission needs driven by Public Policy Requirements are included in the NTTG Initial Regional Transmission Plan.
- No additional Stakeholder needs driven by Public Policy Requirements were submitted.



Change Case Matrix

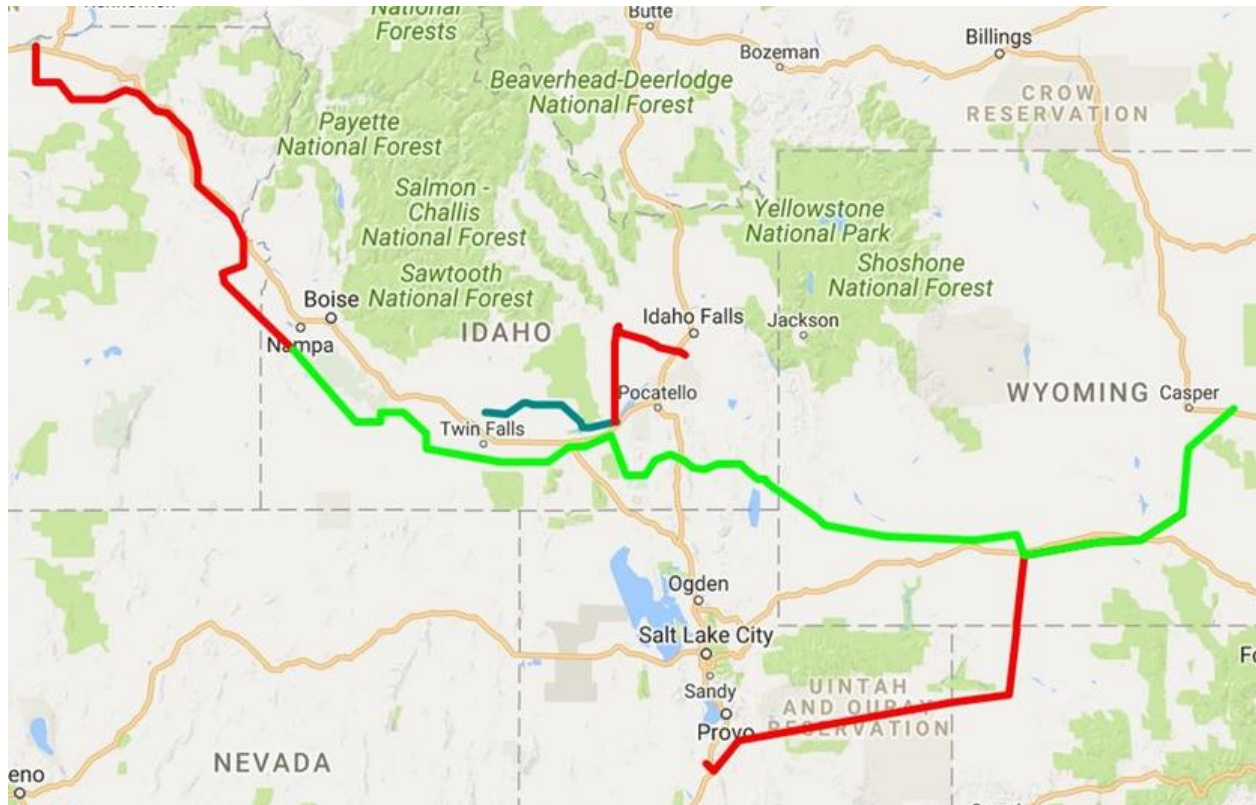
Case	Gateway B2H	Gateway S	Gateway W	Antelope Projects	Cross-Tie SWIP N	TWE DC	TWE DC/AC	Stressed Conditions:
null								A B C F G H I
pRTP	✓	✓	a	✓				A B C E F G H I
iRTP	✓	✓	✓	✓				A B C E F G H I
CC1	✓							A B C F G I
CC2		✓		✓				A C E F I
CC3		✓	a					A C E F I
CC4	✓		a	✓				A C E F I
CC5	✓	✓		✓				A C E F I
CC6	✓	✓	a					A B C E F G H I
CC7							✓	A B C E F I
CC8						✓		A B C E F I
CC9					✓			A B C F I
CC10					✓			A B C F
CC11				✓			✓	(E)+RPS@1500
CC12		✓		✓			✓	(E)+RPS@1500
CC13			a	✓			✓	(E)+RPS@1500
CC14		✓	a	✓			✓	(E I)+RPS@1500
CC15				✓		✓		(E)+RPS@1500
CC16		✓		✓		✓		(E)+RPS@1500
CC17			a	✓		✓		(E)+RPS@1500
CC18		✓	a	✓		✓		(E)+RPS@1500
CC19				✓	✓			(E)+RPS@1500
CC20		✓		✓	✓			(E)+RPS@1500
CC21		✓	a	✓	✓			(E I)+RPS@1500
CC22			a	✓	✓			(E)+RPS@1500
CC23		✓	a	✓	✓			(E I)+RPS@1500
CC24		✓	a	✓	✓	✓		(E I)+RPS@3000
CC25			a	✓	✓		✓	(E)+RPS@3000
CC26		✓		✓	✓	✓		(E)+RPS@3000
CC27		✓	a	✓	✓	✓	✓	(E)+RPS@4500
CC28			a	✓	✓	✓		(E)+RPS@3000
CC29		✓		✓	✓	✓		(E)+RPS@3000
CC30		✓	a	✓	✓	✓		(E)+RPS@4500
CC31	✓	✓	b	✓				E F G I
CC32	✓	✓	c	✓				F G I
CC33	✓	✓	d	✓				E F G I

- The change case does not include the non-Committed Project
- ✓ The change case includes the non-Committed Project
- a Gateway West without Midpoint-Hemingway #2, Cedar Hill-Midpoint and Populus-Borah
- b pRTP less Populus-Cedar Hill-Hemingway
- c pRTP less Populus-Cedar Hill-Hemingway plus Populus-Borah
- d pRTP less Populus-Cedar Hill-Hemingway and Anticline-Populus
- The change case was run with and without B2H



Draft Regional Transmission Plan

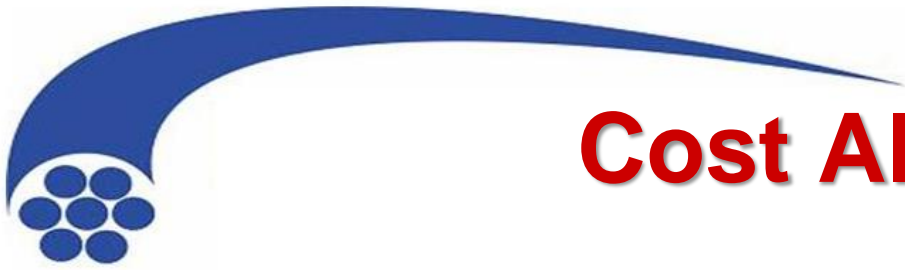
Based on the reliability and economic considerations the more efficient or cost-effective draft plan is the pRTP.





Impacts on Other Regions

- In developing the DRTP, using a system model representing the entire Western Interconnection, no negative impacts to other regions were identified.
- Technical studies indicated that the DRTP would support each of the Interregional Transmission Projects (ITPs) submitted, however, none of the ITPs satisfied a Northern Tier regional need



Cost Allocation

- None of the projects selected into the dRTP will have costs allocated

2018-2019 Draft Regional Transmission Plan Stakeholder Comments & NTTG's Response

Presented by Chelsea Loomis,
NTTG Planning Committee Chair



Stakeholder Comments and NTTG's Response

- One set of comments were received from the “Joint Parties” on behalf of
 - Deseret Power,
 - Utah Association of Energy Users,
 - Utah Department of Commerce Office of Consumer Services,
 - Utah Associated Municipal Power Systems,
 - Utah Municipal Power Agency,
 - Wyoming Industrial Energy Consumers



Stakeholder Comments and NTTG's Response

- NTTG has reviewed and responded to each comment. These comments and NTTG's responses are posted on the NTTG website and can be found via the following link:

[2018-19 NTTG DRTP SH Comments NTTG Response Approved
02-13-2019](#)



Draft Regional Transmission Plan Revisions

- Based on comments submitted and input from the NTTG Technical Workgroup changes have been made to the DRTP.
- The changes are reflected in the following link:
[NTTG 2018-19 Draft Regional Transmission Plan v1.2 02 06 19 Redlined](#)

Public Policy Consideration (PPC) Study

Presented by Jared Ellsworth,
NTTG Planning Committee Vice Chair



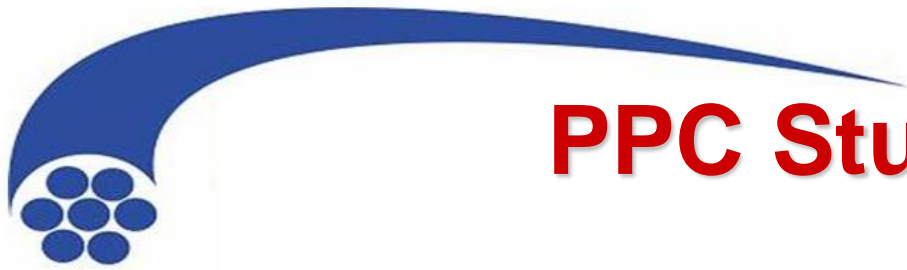
Public Policy Considerations (PPC)

- Public Policy Considerations (PPC) means those public policy considerations that are not established by local, state, or federal laws or regulations
- PPC study results are informational only and may inform NTTG's RTP but will not result in inclusion of additional transmission projects



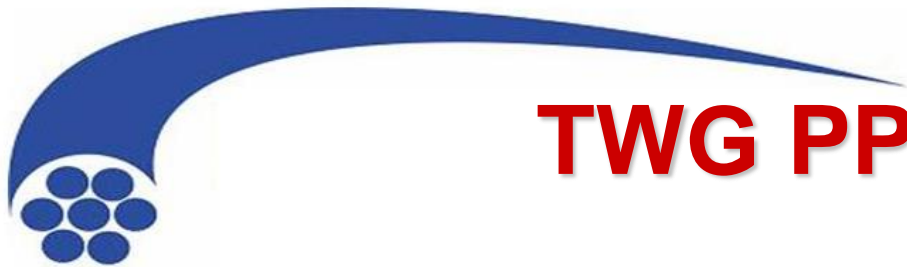
PPC Study Request

- In Q1-2018 a PPC study request was submitted by Joint Parties comprised of:
 - Deseret Power,
 - Utah Associate of Energy Users,
 - Utah Associated Municipal Power Systems,
 - Utah Office of Consumer Services,
 - Utah Municipal Power Agency, and
 - Wyoming Industrial Energy Consumers
- On May 9, 2018, the NTTG Planning Committee approved the PPC Study Request to study the retirement of additional coal fired generation not being considered in the 2018-2028 NTTG 10-year planning window



PPC Study Plan:

- The Study Request was approved by the Planning Committee in May, 2018 and a Study Plan for the analysis was approved by Steering in July, 2018
- In Q5-2019, three stressed conditions were studied:
 1. High Wyoming Wind (Case F)
 2. High Southern Idaho Export (Case D)
 3. High Southern Idaho Import (Case C)
- For each stressed case, the following were modeled off-line:
 - Jim Bridger 1
 - Naughton 1 & 2



TWG PPC Study:

- The High Southern Idaho Import case was dropped in the DRTP analysis. TWG has replaced it with two other cases. The cases used in the study are:
 1. High Southern Idaho Import (Case C)
 2. High Wyoming Wind (Case F)
 3. High Borah West (Case G)
 4. High Aeolus South & West (Case I)
- No change to the unit retirements.



PPC TWG Replacement Resources:

- Idaho Power's make-up power from the Bridger #1 retirement would be from the Northwest (Coulee) via the B2H Project.
- PacifiCorp's make-up power:
 - No new information had been through the IRP process
 - TWG choose to perform three bracketing scenarios of make-up power:

Scenario 1:	Wyoming Wind – 850 MW of Capacity
Scenario 2:	Utah Wind – 1025 MW of Capacity
Scenario 3:	Northwest resource – Coulee
 - Solar resources were considered, however, three of the four selected cases are night time conditions



PPC TWG Replacement Resources:

- For PacifiCorp's Scenarios 1 and 2, the wind capacity was shaped consistent with other adjacent wind resources.

	Case C	Case F	Case G	Case I
PACE retired MW	343.0	884.6	830.0	556.9
Scenario 1	231.5	780.2	655.7	882.9
Scenario 2	579.4	707.8	562.2	579.1

- Scenario 1 – MW were placed at Evanston, Rock Springs and Aeolus
- Scenario 2 – MW were placed at BlackRock



Wyoming Net Resource Change:

- PacifiCorp's Wyoming Resources:

	Thermal	Wind	Solar	Total
Existing	3155	1334	0	4489
Planned	-1042	1613	138	727
Total in 2028	2113	2949	138	5216



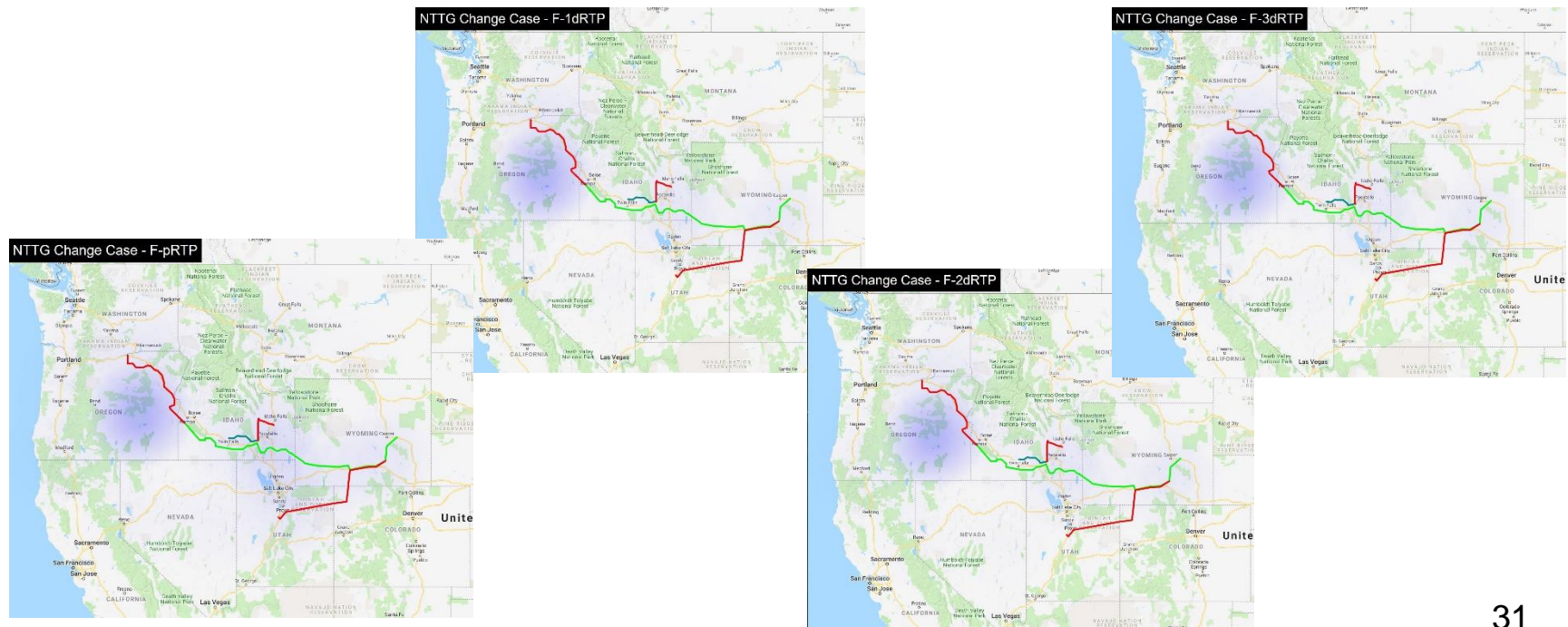
TWG PPC Studies:

- This strategy created 12 cases to apply contingency analysis to:
 - Null – no future transmission additions
 - dRTP – Facilities in draft report
 - CC4 – Gateway South without Gateway West
 - CC5 – Gateway West without Gateway South
 - CC31 – dRTP without Populus-Cedar Hill-Hemingway
 - CC32 – CC31 but add Populus-Borah
 - CC33 – CC31 without Anticline-Populus



TWG PPC studies:

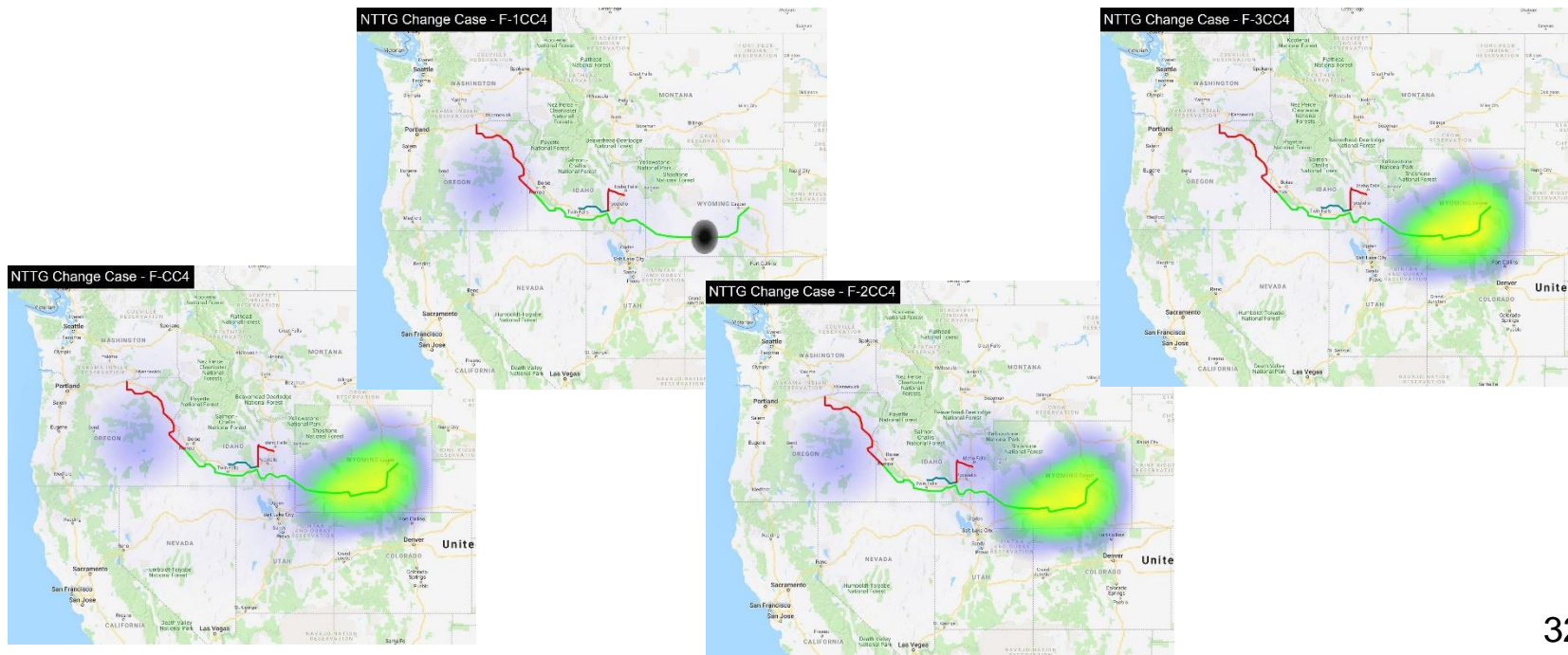
- The dRTP plan performs satisfactorily in all three resource scenarios studied across all four stressed conditions. For example Case F:





TWG PPC studies:

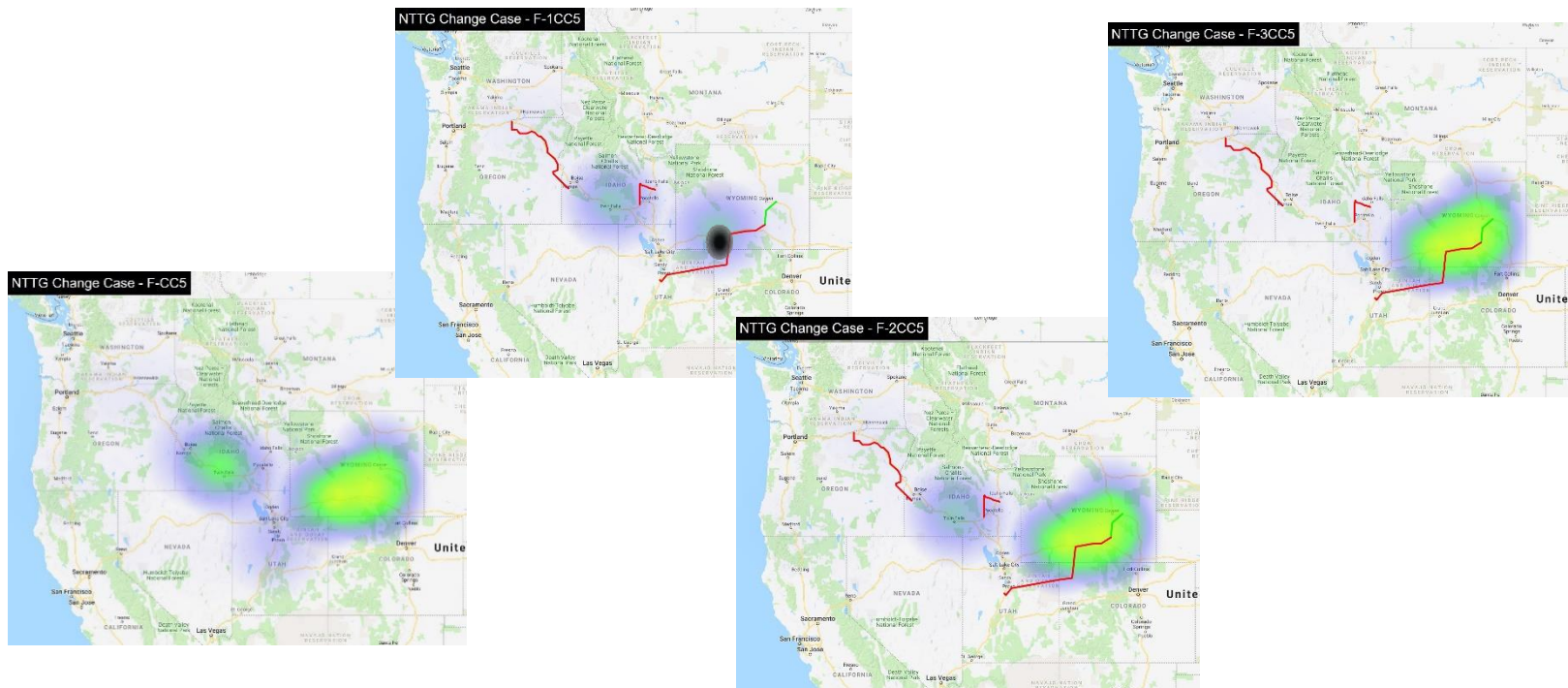
- Gateway West without Gateway South has problems in Cases F, G and I in all three resource scenarios. For example Case F:





TWG PPC studies:

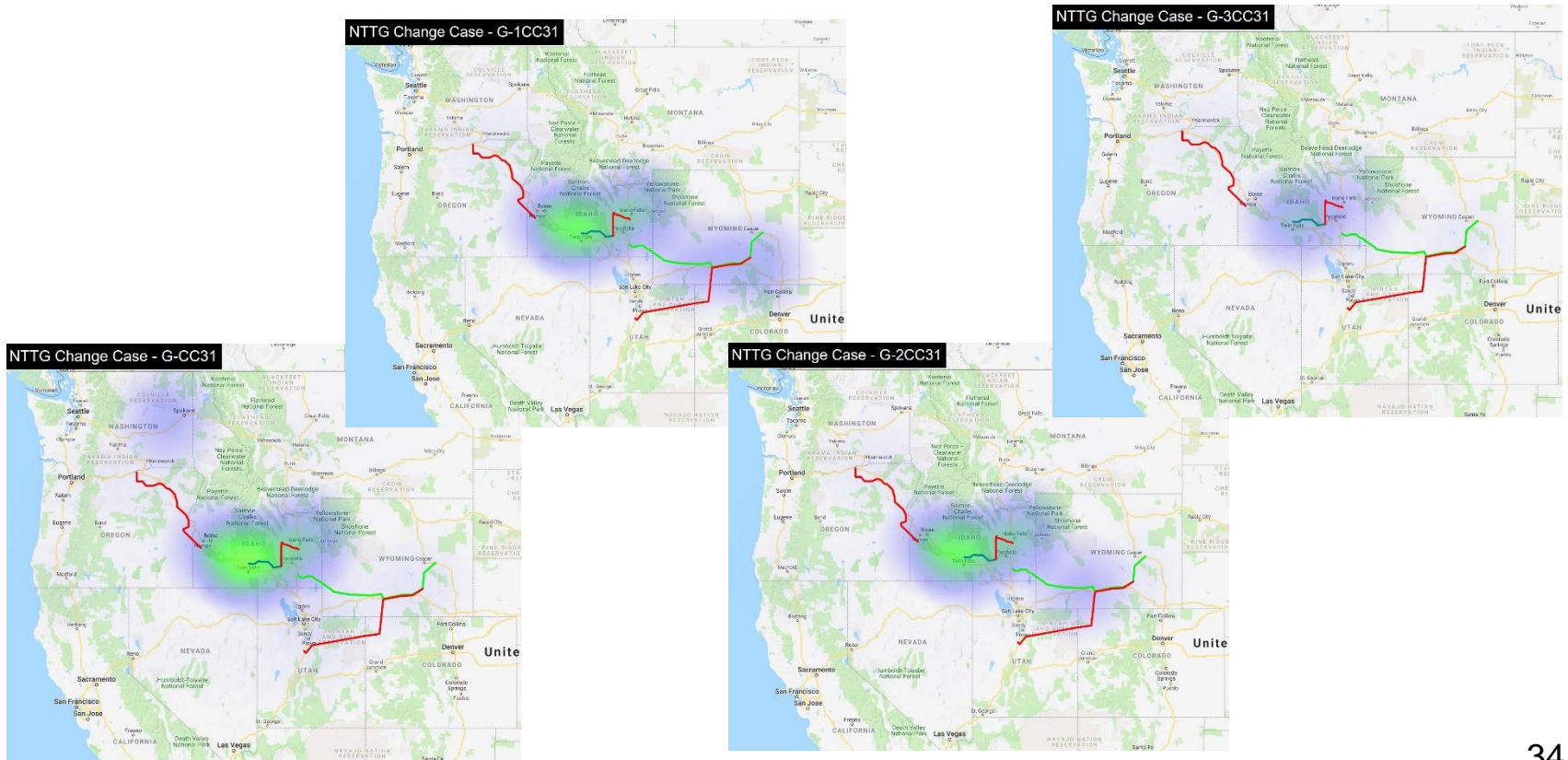
- Gateway South without Gateway West has problems in Cases F, G and I in all three resource scenarios. Again, Case F:





TWG PPC studies:

- Populus to Hemingway need. From Case G:





TWG PPC Observations:

The Study Plan wanted a review of the following segments:

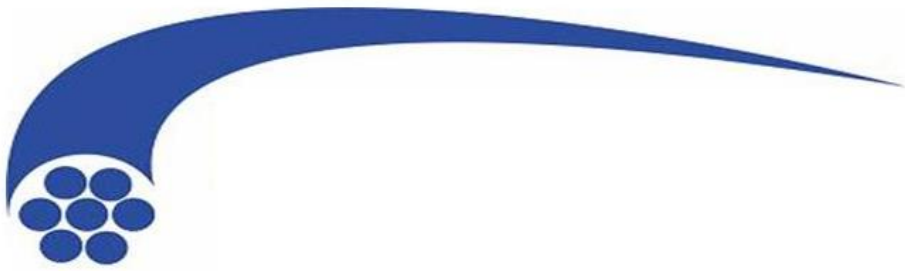
- Anticline – Populus 500 kV
 - Necessary to support outage of Aeolus-Clover
- Aeolus – Clover 500 kV
 - Necessary to support outage of Aeolus-Anticline
- Populus – Cedar Hill 500 kV & Cedar Hill – Hemingway 500 kV
 - Necessary to avoid overloads in Southern Idaho
- Populus – Borah 500 kV
 - Not part of dRTP but would partially mitigate a Populus-Hemingway removal



TWG PPC Observations Continued:

Continuing segment review:

- Borah – Midpoint 500 kV & Borah 500/345 kV transformer (uprating Kinport-Midpoint 345 kV)
 - Upgrade necessary to support increased westbound transfers with Populus-Hemingway
- Midpoint – Hemingway #2 500 kV
 - Not part of dRTP. Needed at higher Borah West transfers than modeled in 2028
- Midpoint – Cedar Hill 500 kV
 - Not part of dRTP. Needed at higher Borah West transfers than modeled in 2028



Questions

Q5 Data Submittal Update

Presented by Jared Ellsworth,
NTTG Planning Committee Vice Chair



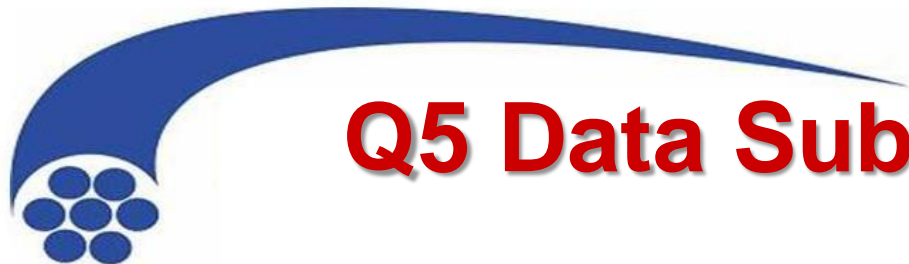
Q5 Data Submittal Update: Purpose

- Provides an opportunity for Transmission Providers and Stakeholders to inform NTTG of any material changes the data submitted in Q1 that may impact the draft Regional Transmission Plan
- In Q5 the windows was also open for Economic Study Requests



Q5 Data Submittal Update

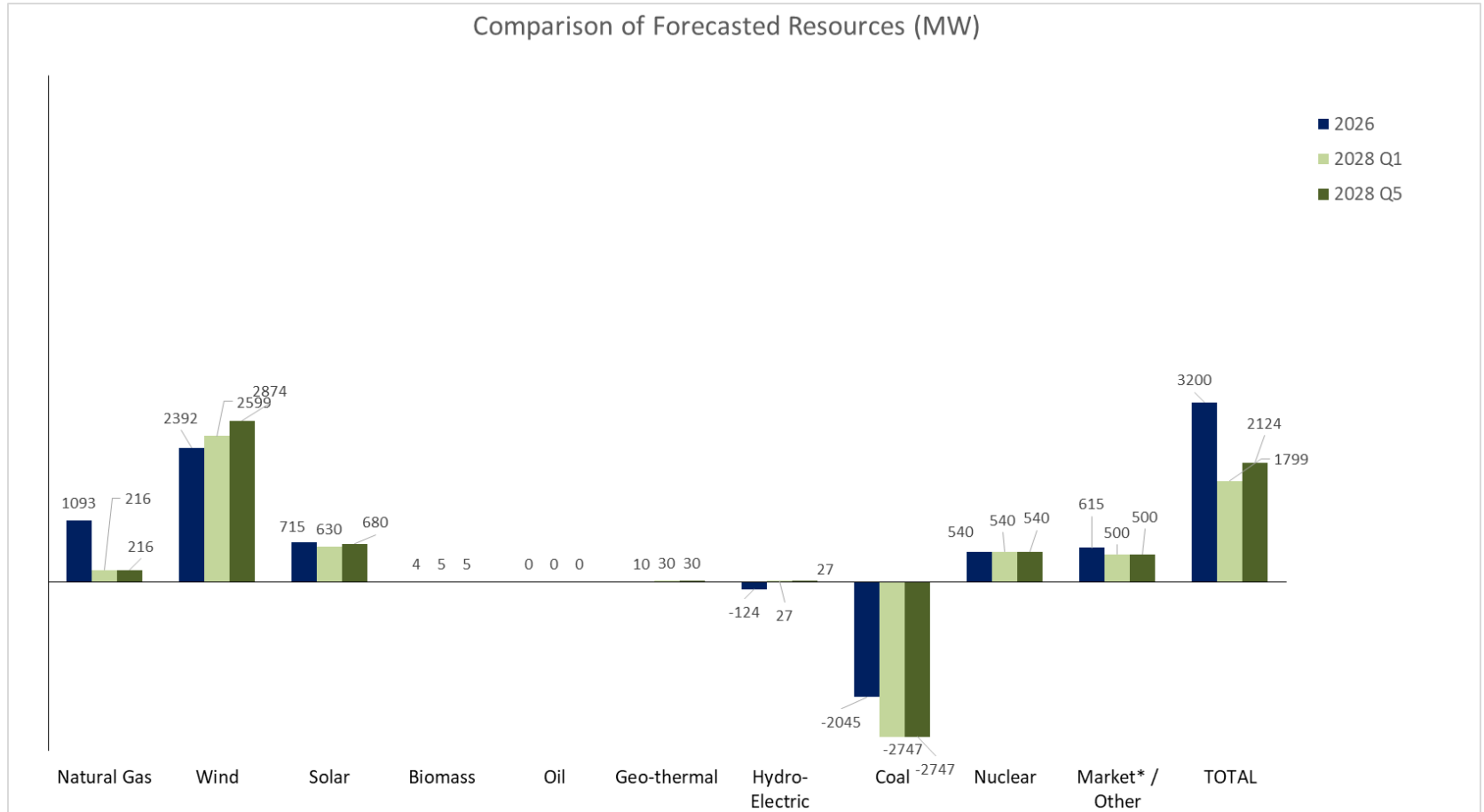
- Data Submittals by:
 - Portland General
 - MATL
 - Northwestern
 - Idaho Power
 - PacifiCorp
- Economic Study request:
 - Alternative Transmission Configuration



Q5 Data Submittal Update:

- High Level summary of submittals:
 - Northwestern
 - Load Forecast increased 3 MW
 - 25 MW wind project cancelled
 - Portland General
 - Load Forecast increased 132 MW
 - Added 300 MW wind and 50 MW solar
 - Idaho Power
 - Load Forecast reduced 113 MW
 - MATL
 - Change Gen in-service date
 - PacifiCorp
 - Indicated that there were no material changes to Q1 data

Q5 Data Submittal Update:





Economic Study Request

- Study an alternative transmission configuration to:
 - Replace 500 kV Gateway West and South projects with one or two 345 kV lines between Windstar-Aeolus area to Populus-Borah-Midpoint area.
- This request will be considered by the NTTG Planning Committee at the April 24th committee meeting



Q6 NTTG Study Scope

- Q5 submitted changes would not appear to alter the Draft Regional Transmission Plan
- In Q6 the TWG will:
 - Review PCM data changes since July 2018
 - Perform additional robustness test on the DRTP
 - Address the submitted Economic Study Request

Regional Coordination

NTTG Stakeholder Meeting
April 18, 2019



Planning Region Updates

- CAISO – Gary DeShazo



- ColumbiaGrid – Paul Didsayabutra



- WestConnect – Charlie Reinhold



Next Steps and Upcoming Opportunities for Stakeholder Input

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April 18, 2019



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Stakeholder Comments/ Other Business



Thank You!