NORTHERN TIER
TRANSMISSION GROUP

NTTG Quarter 6 Stakeholder Meeting

Boise, ID

June 30, 2015

NTTG Q6 Stakeholder Meeting

Agenda	
10:30 – 10:45	**WELCOME and AGENDA REVIEW** • NTTG Milestone and Schedule Overview
NTTG DRAFT FINAL REGIONAL TRANSMISSION PLAN PROJECT SELECTION	
10:45 – 12:00 noon	• NTTG Planning Process: Process Overview, Hurdles Encountered and Lessons Learned

	• NTTG Draft Final Regional Transmission Plan: Process
	  • Setting the Stage: Q1 thru Q5 Overview
	  • NTTG Q5-Q6 Additional Studies
	  • New Alternative Project Identification
	• Draft Final Regional Transmission Plan: Report

12:00 – 1:00	**LUNCH BREAK**

NTTG Q6 Stakeholder Meeting

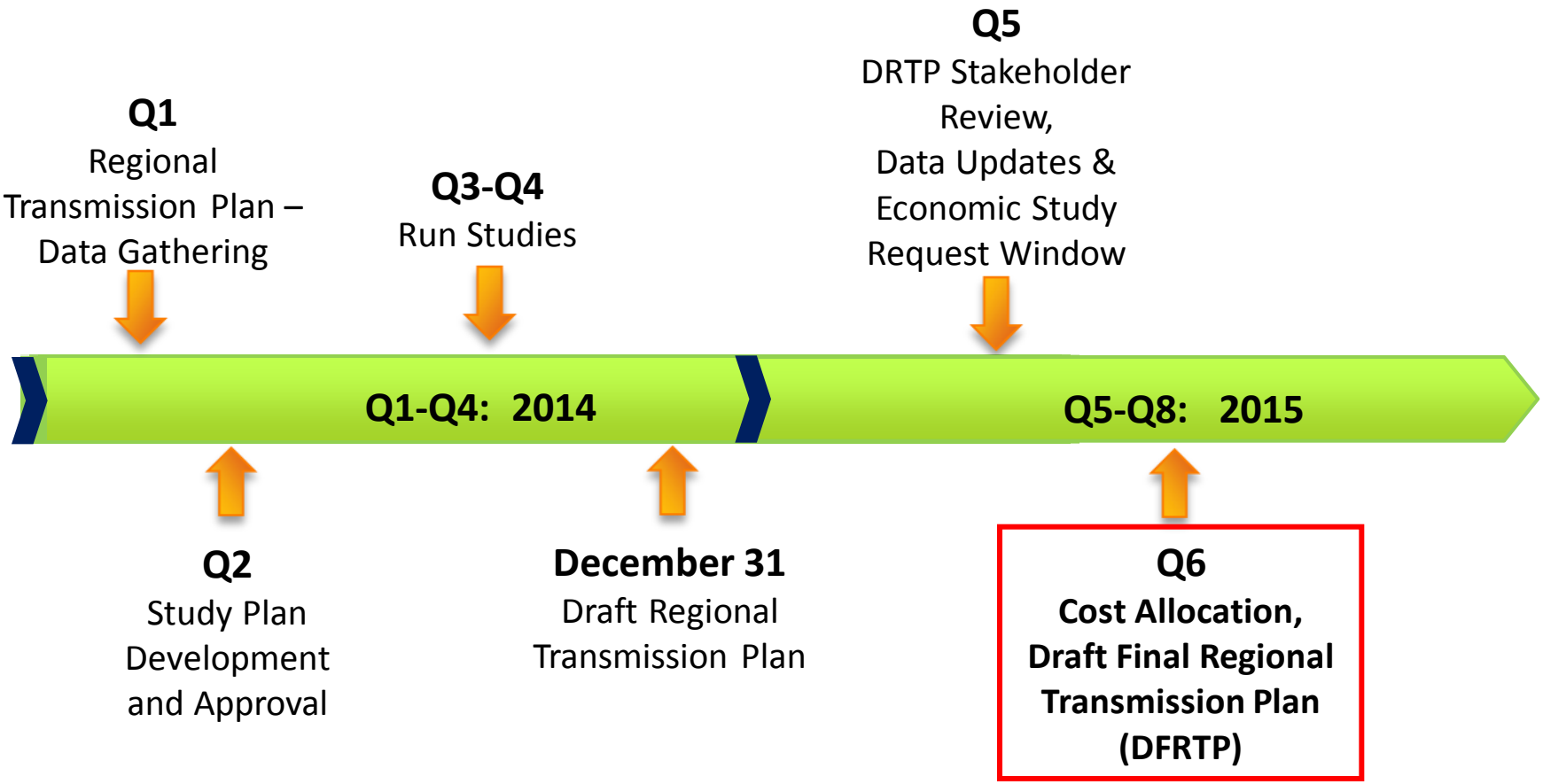
Agenda (Cont'd.)

NTTG DRAFT FINAL REGIONAL TRANSMISSION PLAN COST ALLOCATION	

1:00 – 1:45	• NTTG Draft Final Regional Transmission Plan: Cost Allocation
	  • Cost Allocation Scenarios and Study Plan
	  • Cost Allocation Scenarios: Base Case Development
	  • Cost Allocation Analysis
	  • Allocation of Project Costs to Beneficiaries

1:45 – 2:00	• Western Planning Region Interregional Coordination
2:00 – 2:30	**NEXT STEPS and OTHER BUSINESS**
2:30	**ADJOURN**

2014-2015 Regional Transmission Plan (RTP) – Up Til' Now



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NTTG Draft Final Regional Transmission Plan Update: Project Selection

NTTG Quarter 6 Stakeholder Meeting

Boise, ID

June 30, 2015

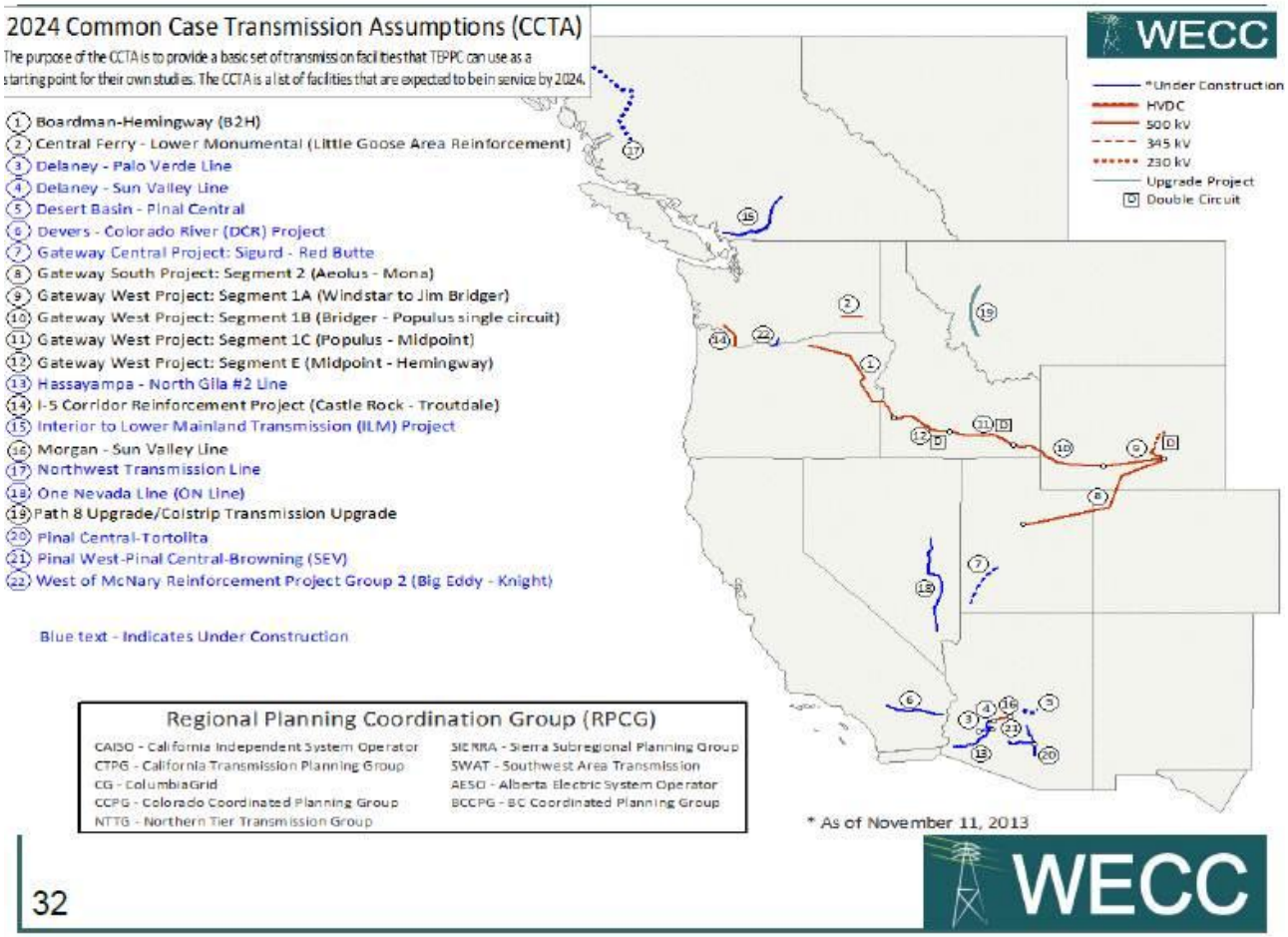
NTTG 1st Order No. 1000 Planning Process Overview

Final Regional Transmission Plan

Draft Regional Transmission Plan

Initial Regional Transmission Plan

Initial Regional Transmission Plan



Lessons Learned

Study Plan

Data Submission

Case Selection

Project Selection

Power Flow Analysis

Capacity Analysis

Cost Allocation

Benefits

Beneficiaries

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NTTG Draft Final Regional Transmission Plan: Process

NTTG Draft Final (RTP)
Q1-Q5: How we got to here

- Q1 – First data submittal
- Q2 – Determined which submitted projects were non-Committed Projects, developed the 2014-2015 Biennial Study Plan & decided on a Public Policy Consideration (PPC) study.
- Q3 - Compiled five stress cases from the TEPPC PCM case (2013 data loads & resources). These cases included all of the Common Case Transmission Assumptions (CCTA) projects as well as the NTTG submitted projects and Full Funders Local Transmission Plans which constitute the Initial Regional Plan (IRP).
- Q4 – Developed Change Cases by removing the non-Committed Projects (B2H & EG) from the IRP cases. Performed power flow work to determine a more efficient or cost-effective Change Case for the Draft RTP. This was determined to be one that included an unsponsored 500 kV Alternative Project from Aeolus (So. WY) to Anticline (SW WY) to Populus (So. Idaho)

NTTG Draft Final (RTP)
Q1-Q5: How we got to here

- Q4 (cont.) - Draft Regional Transmission Plan report - Completed Dec. 31, 2014
- Lessons Learned in Q1 to Q4:
  - Because the Q3, Q4 cases used the TEPPC PCM case to maintain the coincident dispatch in the Western Interconnect, the PacifiCorp loads and resources were lower than in their Q1 submittal.
  - Original study plan did not consider transmission needs and available transmission capacities (ATC).

NTTG Draft Final (RTP)
Q1-Q5: How we got to here

- Q5 – Completed the Revised Biennial Study Plan - Approved on March 9, 2015
  - Allowed for additional studies to be performed with updated load and resource data submitted in Q1 or Q5 that were significantly higher.
  - Added section on transmission needs and available capacities
- Q5 - Began Additional Studies with Q1 submitted loads and resources for PacifiCorp

NTTG Draft Final (RTP) Data Updates in Q5

- Load forecast for 2024
  - no changes from Q1 submittal
  - Started additional studies with Q1 data submittal in January, 2015
- Resource forecast for 2024
  - Nearly 1000 MW of new resources were submitted near the end of Q5
  - TWG determined that there was not enough time to do an in-depth study of these new resources. Instead, TWG performed two high-level studies with the summer case only. These results inform the RTP for next cycle.

NTTG Draft Final (RTP)
New Q5 Resources

- Resource total in Q5 increased from 6605 MW (Q1) to 7592 MW (987 MW increase):
  - \+ 431 MW Solar in Idaho, Oregon
  - \+ 10 MW wind (OR)
  - \+ 10 MW hydro in ID, MT
  - \- 64 MW coal (Boardman)
  - \+ 600 MW Nuclear in Butte County, Idaho

NTTG Draft Final (RTP)
Q5 (2015) Transmission Project Updates

- Boardman to Hemingway
  - + Year in service changed to 2021
  - + Cost increase from $940M to $1.14B plus $60M for terminal facilities

NTTG Draft Final (RTP) Q5 (2015) New Transmission Service Updates

Submitted by	MW	Start Date	End Date	POR	POD	Does new service require xmsn upgrades?
Idaho Power	500 summer	2021	-	Northwest	IPCo	Y
	200 winter	2021	-	Northwest	IPCo	Y
	250 summer	2021	2028	Northwest	BPA SEID	Y
	550 winter	2021	2028	Northwest	BPA SEID	Y

NTTG Draft Final (RTP) Transmission Needs and Capabilities Analysis

WECC Path Number/ Direction	2014 TTC (MW)	2014 ATC (MW)	2014 Transmission Capacity Utilized (MW)	Transmission Obligation Change Between 2014 and 2024 (MW)	2024 Transmission Capacity Needed (MW)
14 W-E (ID-NW)	1200	0	1200	750	**1950**
82 W-E (TOTBEAST)	2465	150	2315	750	**3065**
17 W-E (Borah W)	1600	1445	155	550	**705**

WECC Path Number/ Direction	2024 Transmission Capacity Needed (MW)	2024 TTC for each Proposed Topology (MW)		
		2024 TTC IRTP (w/ B2H)	2024 TTC Draft RTP (w/o B2H)	2024 TTC DFRTP (w/B2H)
14 W-E (ID-NW)	**1950**	2250	1200	2250
82 W-E (TOTBEAST)	**3065**	3515	2465	3515
17 W-E (Borah W)	**705**	1600	1600	1600

Red - not acceptable Green - acceptable

NTTG Draft Final (RTP) Transmission Needs and Capabilities Analysis

- The Q4 Draft RTP does not meet the transmission requirements of Idaho Power.
- Addition of the Boardman to Hemingway (B2H) project does meet the transmission requirements of Idaho Power.
- B2H selected into the DFRTP

NTTG Draft Final (RTP)
Q5-Q6: Public Policy Consideration Study

- Replace Colstrip 1,2 units with wind generation at Broadview.
- Assumed RAS with wind generator-tripping similar to performance of the ATR
- Similar results with wind replacement but recommend other follow-on studies be considered
- PPC study informs the RTP but does not change it
- Study report approved May 13, 2015 is included in the DFRTP report

NTTG Draft Final (RTP)
Q5-Q6: Additional Studies

- Updated PACE loads & resources for the summer, winter and export cases
- Results with the Draft RTP Alternative Project (Aeolus-Anticline-Populus 500 kV line) were unacceptable with the higher loads and resources because of N-0 and N-1 performance violations in Wyoming
- Added new 230, 345 and 500 kV transmission sections in central and southwest Wyoming to eliminate the violations.

NTTG Draft Final (RTP)
New Alternative Project Identification

- Studied a new Change Case with an Alternative Project consisting of :
  - 1) a new 230 kV line from Windstar to Aeolus and reinforcements to existing underlying system in Wyoming;
  - 2) a new 500 kV line from Aeolus to Anticline to Populus in southern Idaho; and
  - 3) a new 500 kV line from Aeolus to a new substation near Mona, Utah,
  - 4) 345 kV line from Anticline to Bridger.

- Results with the new Change Case met the performance criteria.

NTTG Draft Final RTP
Projects Selected into the Draft Final RTP

1. Boardman to Hemingway 500 kV
2. New Alternative Project consisting of:
    - Aeolus to Anticline to Populus 500 kV
    - Aeolus to Clover 500 kV
    - Windstar to Aeolus 230 kV and reinforcements to existing underlying system in Wyoming
    - Anticline to Bridger 345 kV line

Lessons Learned

Cost Allocation

Benefits

Beneficiaries

Project Selection

Power Flow Analysis

Capacity Analysis

Study Plan

Data Submission

Case Selection

QUESTIONS?

LUNCH BREAK

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NTTG Draft Final Regional Transmission Plan Update: Cost Allocation

NTTG Quarter 6 Stakeholder Meeting

Boise, ID

June 30, 2015

CAC Members

- **Deseret Power Electric Cooperative** - Clay MacArthur
- **Idaho Power** – Courtney Waites
- **Idaho Public Utilities Commission** - Johanna Bell
- **Montana Consumer Council -** Larry Nordell
- **Montana Public Service Commission** - Bob Decker
- **NorthWestern Energy** - Ray Brush
- **PacifiCorp** - Shay Labray (Chair)
- **Portland General Electric** - Amy Light (Vice Chair)
- **UAMPS** - Marshall Empey
- **Utah Office of Consumer Services** - Bela Vastag
- **Utah Public Service Commission** - Joni Zenger
- **Wyoming Office of Consumer Advocates** - Belinda Kolb
- **Wyoming Public Service Commission** - Marci Norby

Topics for Discussion

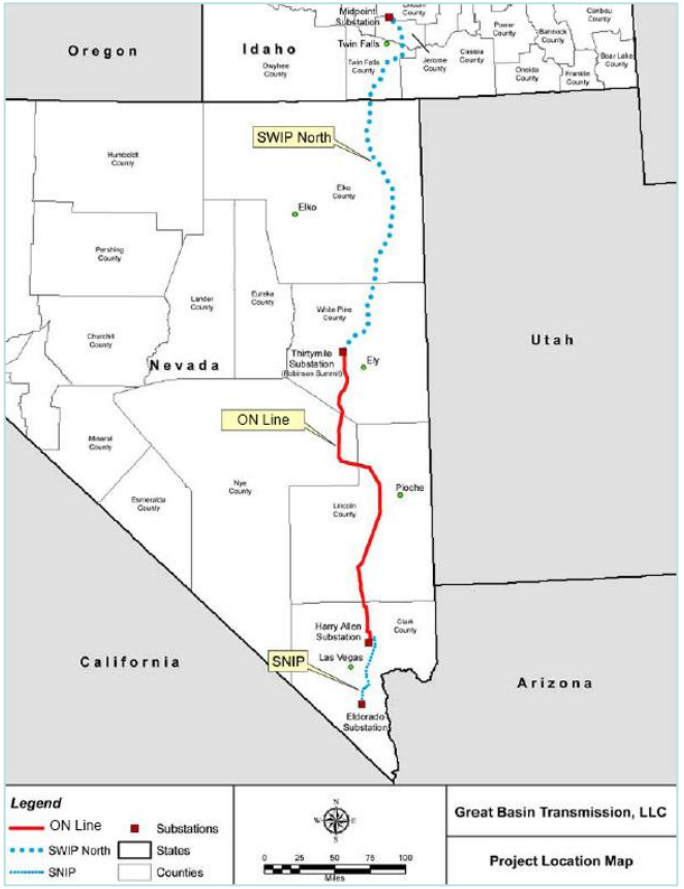
- Review of Order 1000 cost allocation requirements
  - Projects under consideration
- Cost allocation scenario development
  - Approved scenarios
- Cost allocation analysis and results

Order 1000 Requirements

- Cost Allocation Process: What projects in Regional Transmission Plan ("RTP") are cost allocated?
  - Sponsored Project with pre-qualified sponsor
  - unsponsored project identified in planning process
  - unsponsored project proposed by a non-sponsor, and
  - with cost exceeding $20M

Requested Cost Allocation

- LS Power/SWIP-North
  - Pre-qualified
  - Subject to NTTG 2014-2015 Regional Transmission Plan process
- Alternative Project
  - Aeolus to Anticline to Populus 500 kV;
  - Anticline to Bridger 345 kV
  - Aeolus to Clover 500 kV;
  - Windstar to Aeolus 230 kV; and
  - Reinforcements to underlying 230 kV system in Wyoming.



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NTTG Draft Final Regional Transmission Plan: Cost Allocation Scenarios and Study Plan

Cost Allocation Scenarios

1. Allocation scenarios that will "likely affect the amount of total benefits and their distribution among Beneficiaries"
   - Load levels / fuel prices / resource availability / other(?)

2. Why cost allocation scenarios?
   - "recognizes that estimates of the amount and distribution of benefits may be highly uncertain and dependent on key assumptions and projections."
     - simply put – cost allocation may use benefits based on a range of future conditions, whether or not these stress the grid

NTTG Draft Final RTP
Cost Allocation: Scenarios Study Plan

- Approved by the Cost Allocation and Planning Committees on June 3, 2015
- Calls for the creation of allocation scenario base cases based on system conditions recommended by the CAC.
- Outlines the process for developing the benefits of the Draft Final RTP (Change Case) and the four allocation scenarios

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NTTG Draft Final Regional Transmission Plan: Cost Allocation Base Case Development

NTTG Draft Final RTP
Cost Allocation Base Cases

- The Initial RTP cases (summer, winter, export) were updated with the Q5 submitted loads and resources.
- The DFRTP base cases also have updated loads and resources.
- Four allocation scenario cases were created for both the Initial RTP and the Draft Final RTP cases for a direct comparison of economic metrics.

NTTG Draft Final RTP
Cost Allocation Scenarios

- TWG created four scenario cases from both the Initial RTP and the Draft Final RTP
  - Scenario A: +1000 MW of NTTG load
  - Scenario B: - 1000 MW of NTTG load
  - Scenario C: replace 800 MW of wind w/ solar
  - Scenario D: replace energy from 1000 MW of coal with wind and solar
- These cases will be used for cost allocation analysis and for DFTP robustness analysis

NTTG Draft Final RTP
Cost Allocation Scenario A

- Scaled load and generation up within each area as per the CAC recommendations:
  - IPC 167 MW, NWE 81 MW, PACE 387 MW, PACW 184 MW, PGE 181 MW for total of +1000 MW
- Results were acceptable
- No new transmission additions needed
- NTTG total losses for the Change Case Scenario A compared to the Initial RTP Scenario A increased by 14.4 MW, IPC having the largest increase (7.4 MW)

NTTG Draft Final RTP
Cost Allocation Scenario B

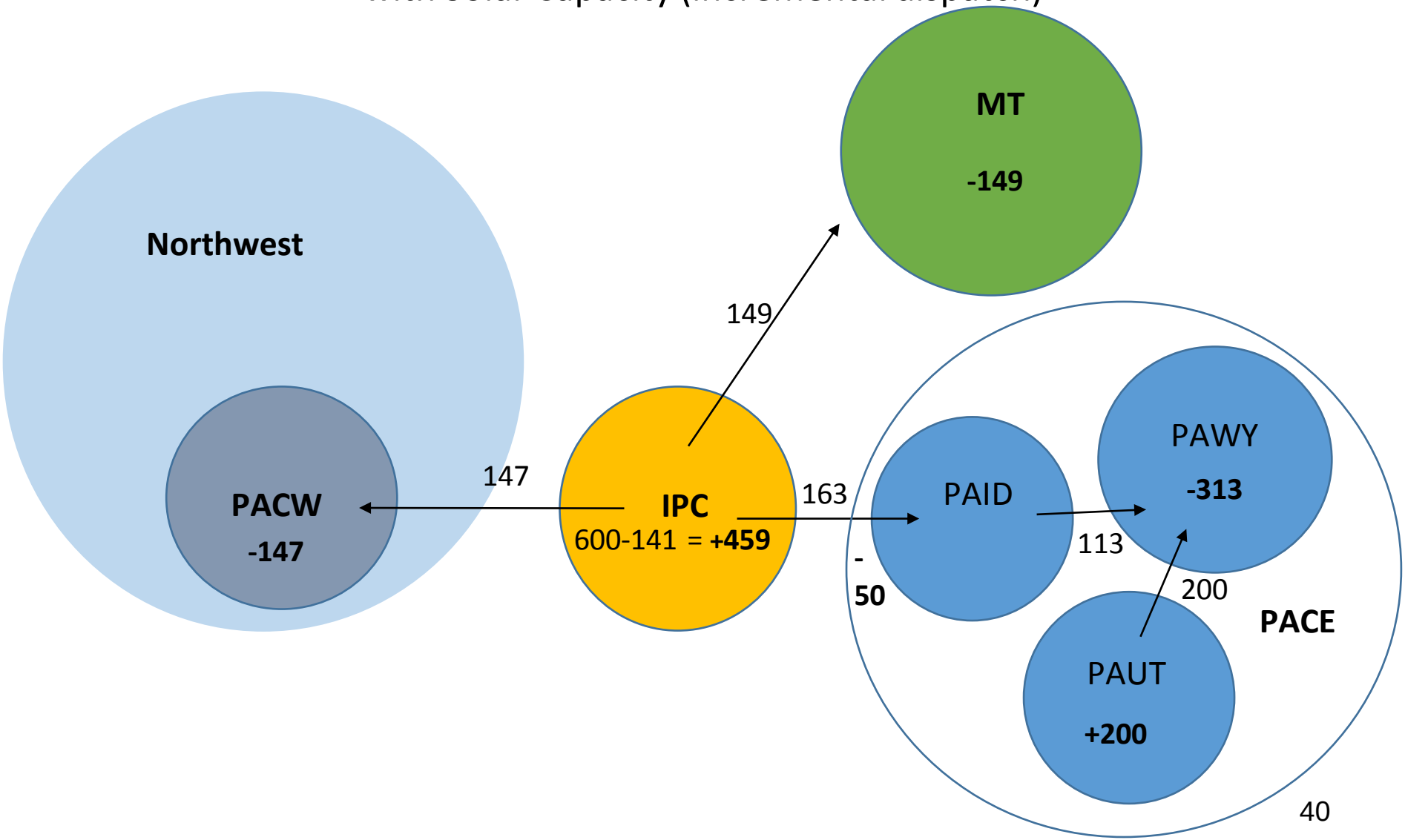
- Scaled load and generation down within each area as per the CAC recommendations:
  - IPC 167 MW, NWE 81 MW, PACE 387 MW, PACW 184 MW, PGE 181 MW for total of -1000 MW
- Results were acceptable
- No new transmission additions needed
- NTTG total losses for the Change Case Scenario B compared to the Initial RTP Scenario B increased by 10.5 MW, with IPC having the largest increase (5.1 MW)

NTTG Draft Final RTP
Cost Allocation Scenario C

- Wind generation was reduced within each area as per the CAC recommendations:
  - IPC 141 MW, NWE 149 MW, PACE 363 MW, PACW 147 MW, for a total of -800 MW
- Solar generation was increased by 600 MW in Idaho and 200 MW in Utah
- Results were acceptable
- No new transmission additions needed
- NTTG total losses for the Change Case Scenario C compared to the Initial RTP Scenario C increased by 7.2 MW, with IPC having the largest increase (3.2 MW)

Cost Allocation – Scenario C

Replace 800 MW of Wind Capacity
with Solar Capacity (incremental dispatch)

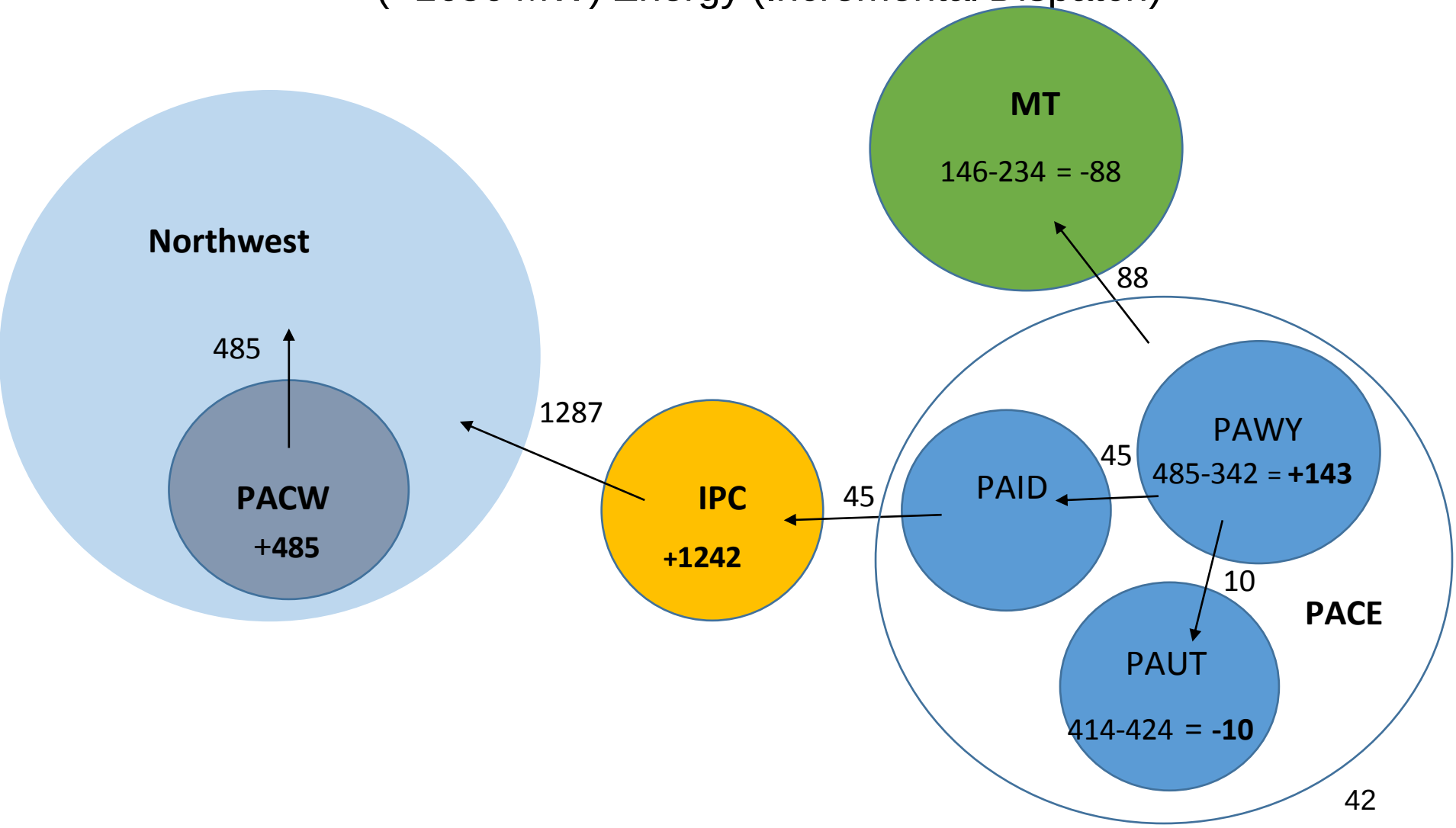


NTTG Draft Final RTP
Cost Allocation Scenario D

- Coal generation was reduced within each area as per the CAC recommendations:
  - UT 424 MW, WY 342 MW, MT 234 MW, for a total of -1000 MW
- Wind generation was increased: PACW 485 MW, WY 485 MW, MT 146 MW (1116 MW total)
- Solar generation was increased by 1242 MW in Idaho and 414 MW in Utah (1656 MW total)
- Results were acceptable
- No new transmission additions needed
- NTTG total losses for the Scenario D compared to the Initial RTP Scenario D increased by 1.1 MW, with PACE having the largest increase (1 MW)

Cost Allocation – Scenario D

Replace 1000 MW of Coal Energy with Wind (1116 MW) and Solar (+1656 MW) Energy (Incremental Dispatch)



NTTG Draft Final RTP Cost Allocation Metrics

- Capital Costs – Only the comparison of the Initial RTP with the Change Case (DFRTP) had a change in capital costs.
- Losses – The losses for the Change Case and all allocation scenarios were annualized and monetized for use in the Cost Allocation workbook.
- Reserves – There were no reserve benefits

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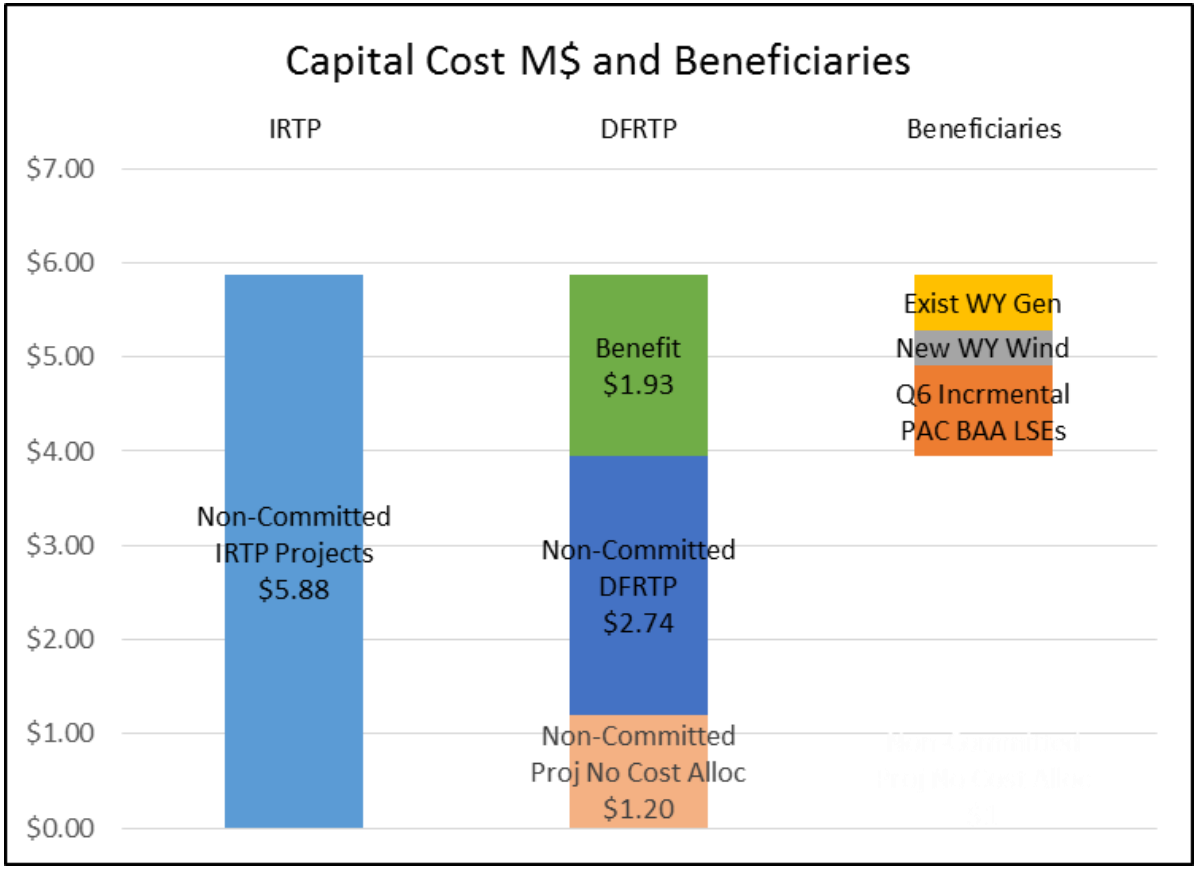
NTTG Draft Final Regional Transmission Plan: Cost Allocation Analysis

NTTG Draft Final RTP
Cost Allocation: Analysis

- Beneficiaries are entities that may be affected by the project based upon the application of the analysis criteria
- Cost Allocation is applied to a transmission project (sponsored or unsponsored) that is selected in the Regional Transmission Plan for purposes of cost allocation
- Start with the Planning Committee calculations
  - Capital Cost Metric
  - Loss Metric
  - Reserve Metric

NTTG Draft Final RTP Cost Allocation: Analysis

- Cost and Beneficiaries



NTTG Draft Final RTP
Cost Allocation: Analysis

- Beneficiaries:
  - The planning assumptions that were instrumental in defining these Beneficiaries are:
    - Those entities that obtain Ownership-Like Rights on the Alternative Project.
    - These Beneficiaries may be (1) new Wyoming generation, (2) existing Wyoming generation, or (3) PacifiCorp's BAA LSEs.
    - The Beneficiary ownership like rights may be point-to-point transmission service or network transmission service on the Alternative Project.

NTTG Draft Final RTP Cost Allocation: Analysis

- Benefit Allocation to Beneficiaries

	Allocation		
DFRTP Beneficiaries	MW	Pct	DFRTP Benefit
Q6 Incremental PAC BAA LSEs Load	1,800	49.8%	$963,621,406
Q6 WY Wind (New)	712	19.7%	$381,165,800
Q6 Incremental WY Gen (Existing)	1,100	30.5%	$588,879,748
Q6 Total	3,612	100%	$1,933,666,954

NTTG Draft Final RTP Cost Allocation: Analysis

- Capital Related Cost Beneficiary Allocation

	Levelized Capital Related Cost Beneficiaries			
	Q6 Incremental PAC BAA LSEs Load	Q6 WY Wind (New)	Q6 Incremental WY Gen (Existing)	Total Benefit
DFRTP	$138,783,318	$54,896,512	$84,812,028	$278,491,858
CAC Scenario A	$138,783,318	$54,896,512	$84,812,028	$278,491,858
CAC Scenario B	$138,783,318	$54,896,512	$84,812,028	$278,491,858
CAC Scenario C	$138,783,318	$37,187,263	$102,521,277	$278,491,858
CAC Scenario D	$138,783,318	$72,804,146	$66,904,394	$278,491,858

NTTG Draft Final RTP
Cost Allocation: Analysis

- Loss Benefit by Beneficiary
- Computed as the IRTP less DFRTP (or CAC Scenario)

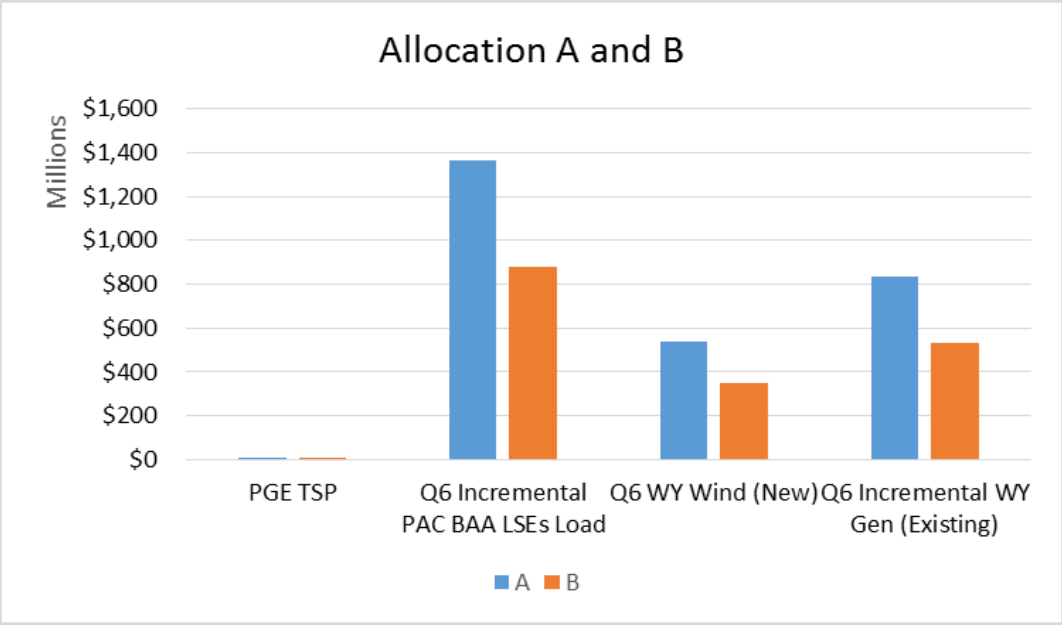
	Loss Benefit			
	IPC TSP	NWE TSP	PAC TSP	PGE TSP
DFRTP	($777,137)	($66,699)	($251,599)	$84,846
CAC Scenario A	($922,591)	($263,766)	($538,304)	$79,960
CAC Scenario B	($635,839)	($218,289)	($419,039)	$79,959
CAC Scenario C	($398,958)	($163,716)	($307,395)	$53,306
CAC Scenario D	($62,337)	$27,286	($92,213)	($0)

NTTG Draft Final RTP
Cost Allocation: Analysis

- Cost Allocation Process – Four Steps:
  1. Verification that Alternative Project eligible for cost allocation
     a. Yes, selected in the DFRTP and cost greater than $20M
  2. Use Planning Committee data and remove those entities that do not receive a benefit.
  3. Two criterion:
     a. Scenario are capped at no less than 50% and no more than 150% of the average of the unadjusted, net benefits;
        i. All scenarios between upper and lower limit
     b. If the average of the net benefits, as adjusted by (a) above, across the allocation scenarios is negative, the average net benefit to that Beneficiary is set to zero.
        i. Average of the scenarios net benefit for IPC TSP, NWE TSP and PAC TSP negative and set to zero
        ii. Average of the scenarios net benefit for PGE TSP positive

NTTG Draft Final RTP
Cost Allocation: Analysis

- Cost Allocation Process – Four Steps:
  4. Allocate Alternative Project costs to beneficiary as the lesser of:
     a. proportional allocation; or
     b. ratio of adjusted net benefits to allocated costs is no less than 1.10.
     c. The lesser of was "b" for beneficiaries allocation of project costs



NTTG Draft Final RTP Cost Allocation: Analysis

- Results

	Loss Beneficiaries	Capital Cost Beneficiaries			
Beneficiary	PGE TSP	Q6 Incremental PAC BAA LSEs Load	Q6 WY Wind (New)	Q6 Incremental WY Gen (Existing)	Sum
Allocated Costs	$376,293	$876,019,460	$346,764,809	$535,094,780	$1,758,255,342

NTTG Draft Final RTP
Cost Allocation: Analysis

- Results Continued

	Total	
Alternative Project Capital Cost	$2,744,026,994	
Beneficiary Allocation of Alternative Project Capital Cost	$1,758,255,342	
Remaining Costs	$985,771,652	Had the Alternative Project been a Sponsored Project or submitted by a stakeholder (each an "Applicant"), the Applicant could have voluntary accept remaining project costs of $985,771,652. If the Applicant did not accept remaining costs the project was no longer eligible for cost allocation. In this case, since the Alternative Project is an unsponsored project identified by the Planning Committee there is not an Applicant to accept the remaining costs of the project. As a result, since all project costs cannot be allocated to Beneficiaries, the Alternative Project is not eligible for cost allocation.

NTTG Draft Final RTP
Next Steps

- Cost allocation of a project is subject to re-evaluation until the project is ‘committed’
- Any unsponsored project in the Final RTP may be re-submitted as a Sponsored Project by a pre-qualified project sponsor in the next biennial planning cycle
- Unassigned costs ultimately must be picked up by the Applicant or fully allocated to the Beneficiaries for the project to be eligible for cost allocation

QUESTIONS?

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Western Planning Regions Interregional Coordination

NTTG Quarter 6 Stakeholder Meeting

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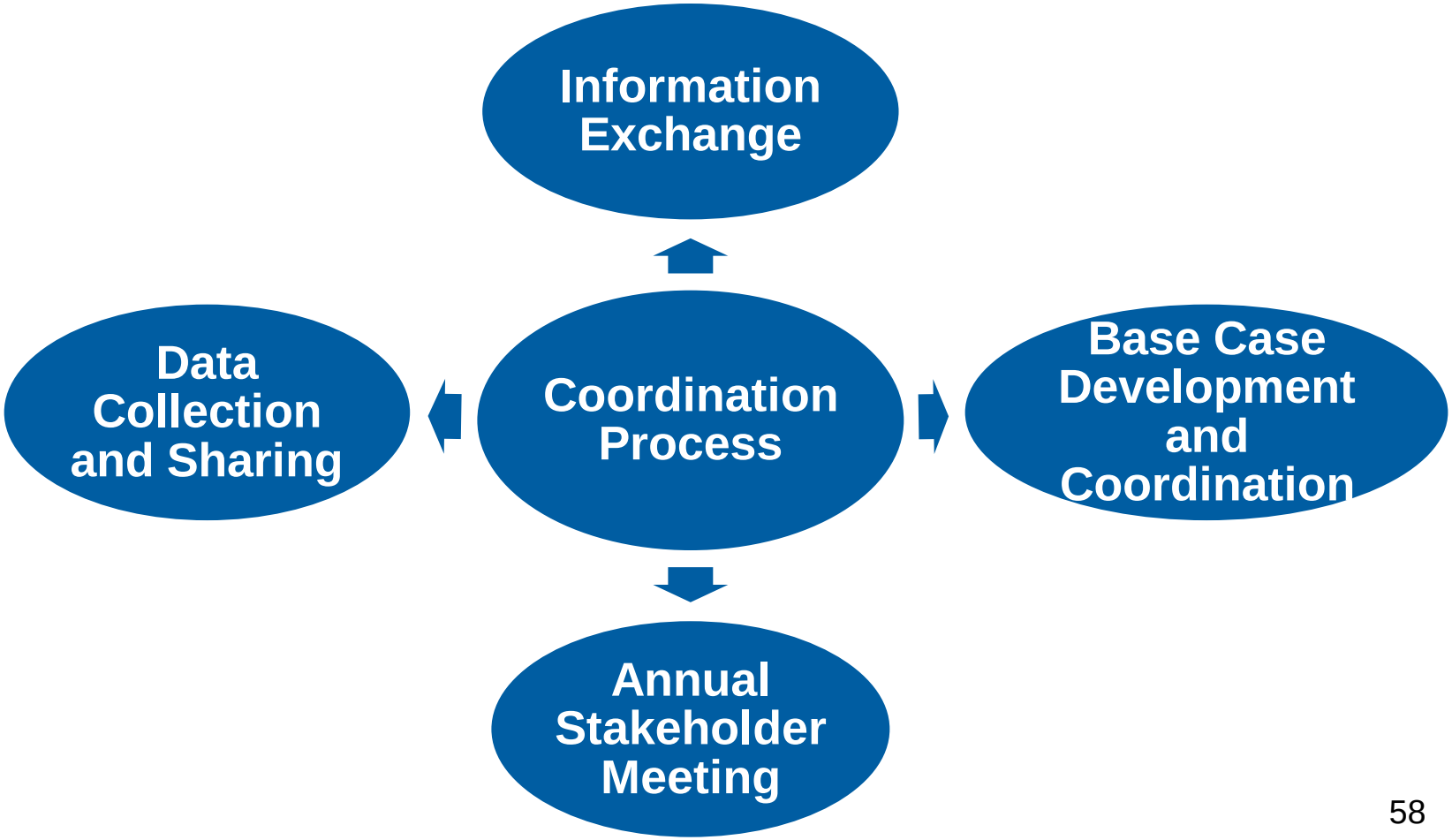
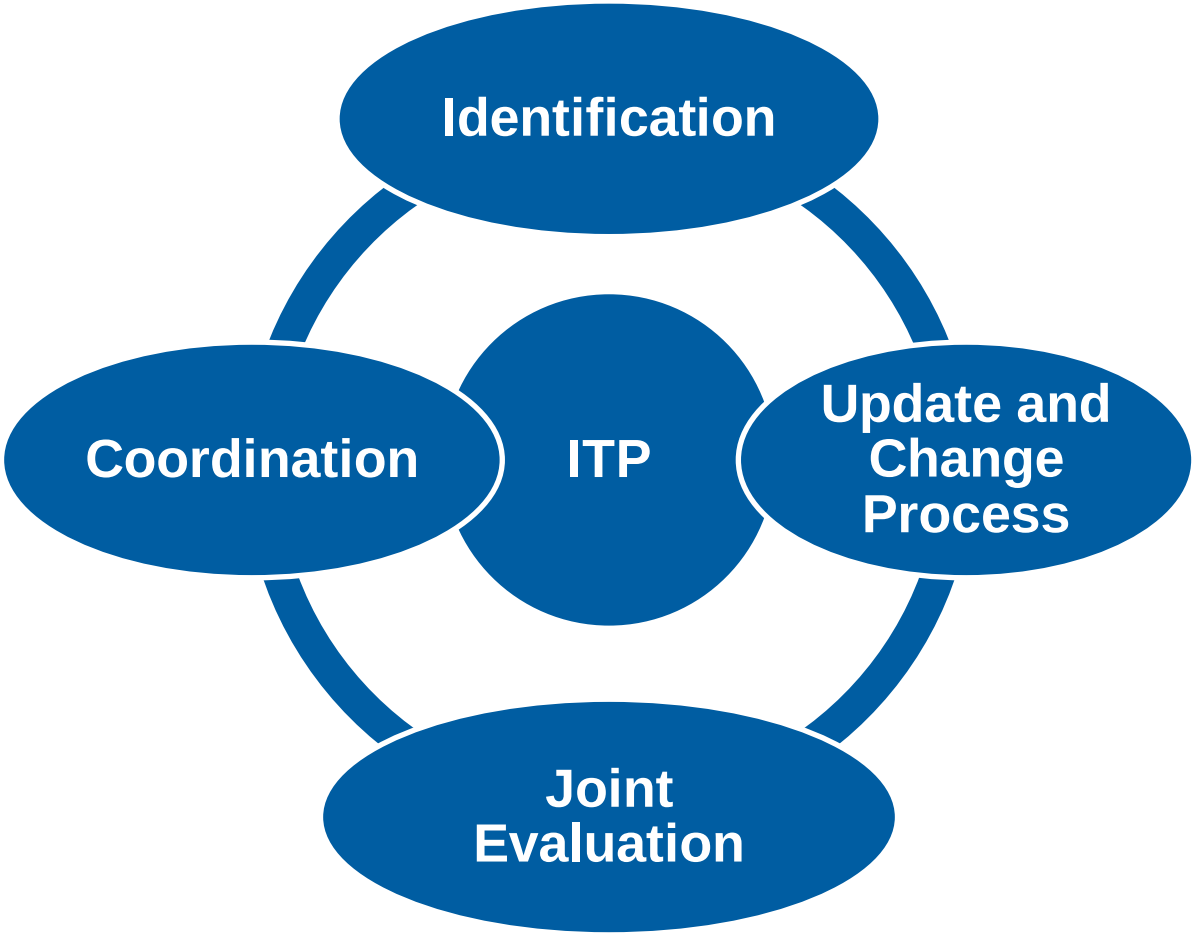
Western Planning Regions (WPR) Interregional Coordination Process



Interregional Transmission Project



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Next Steps

NTTG Quarter 6 Stakeholder Meeting

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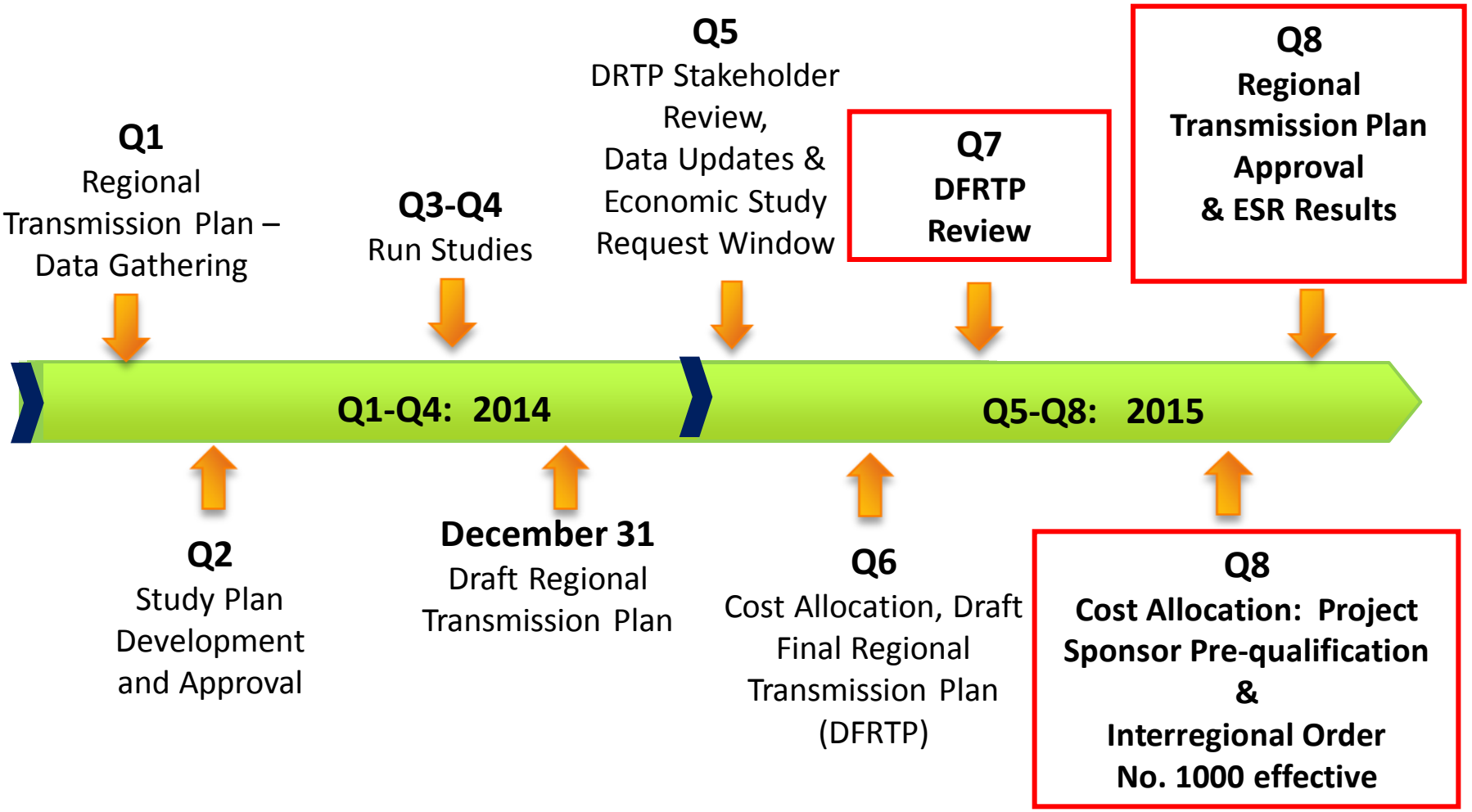
2014-2015 Regional Transmission Plan (RTP) – What's Next



2014-2015 RTP
Next Steps

- Stakeholder Comment Period: July 6-24
  - Notice will be distributed with further details

- Q7 Stakeholder Meeting
  - September 29th in Bozeman, Montana

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Open Mic and Other Business

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Adjourn