Northwest **Power** and **Conservation** Council

October 7, 2025

MEMORANDUM

TO: **Council Members**

FROM: **Joe Walderman and Annika Roberts**

SUBJECT: **Grid Enhancing Technologies**

BACKGROUND:

Presenters: Joe Walderman & Annika Roberts, Council Staff
Jake P. Gentle, Idaho National Labs
Phil Anderson & Erik Schellenberg, Idaho Power

Summary: In our capacity constrained world, there is interest in and need for grid solutions that can be implemented quickly and cheaply. Large-scale transmission projects and upgrades can take many years and can be extremely cost and capital intensive. Grid enhancing technologies (GETs) and advanced reconductoring can help the region get more out of the existing system in the near term and delay or displace the need for larger infrastructure projects and upgrades. Staff has gathered a few regional experts to discuss their work GETs with the intention of starting the conversation of how GETs can be considered in the Ninth Power Plan.

Relevance: There is interest in the upcoming plan to explore the effects of different transmission trajectories on resource selection. This analysis may identify constraints that transmission could mitigate. GETs can serve as a piece of the transmission solution, one that many utilities in the region are exploring.

Workplan:

B.1.1. Advance ninth power plan development by developing scope, models and inputs, and other data and assumptions.

More info: Idaho National Lab, “Advanced Conductor Scan Report”: https://inl.gov/content/uploads/2024/10/23-50856_R12a_-AdvConductorsScanProjectReportCompressed.pdf

Idaho Power: News Release—“Idaho Power and Pitch Aeronautics Team up to Improve Transmission Capacity”: https://www.idahopower.com/news/idaho-power-and-pitch-aeronautics-team-up-to-improve-transmission-capacity/


Grid Enhancing Technologies
Joe Walderman & Annika Roberts
October 2025 Council Meeting
Northwest Power and Conservation Council

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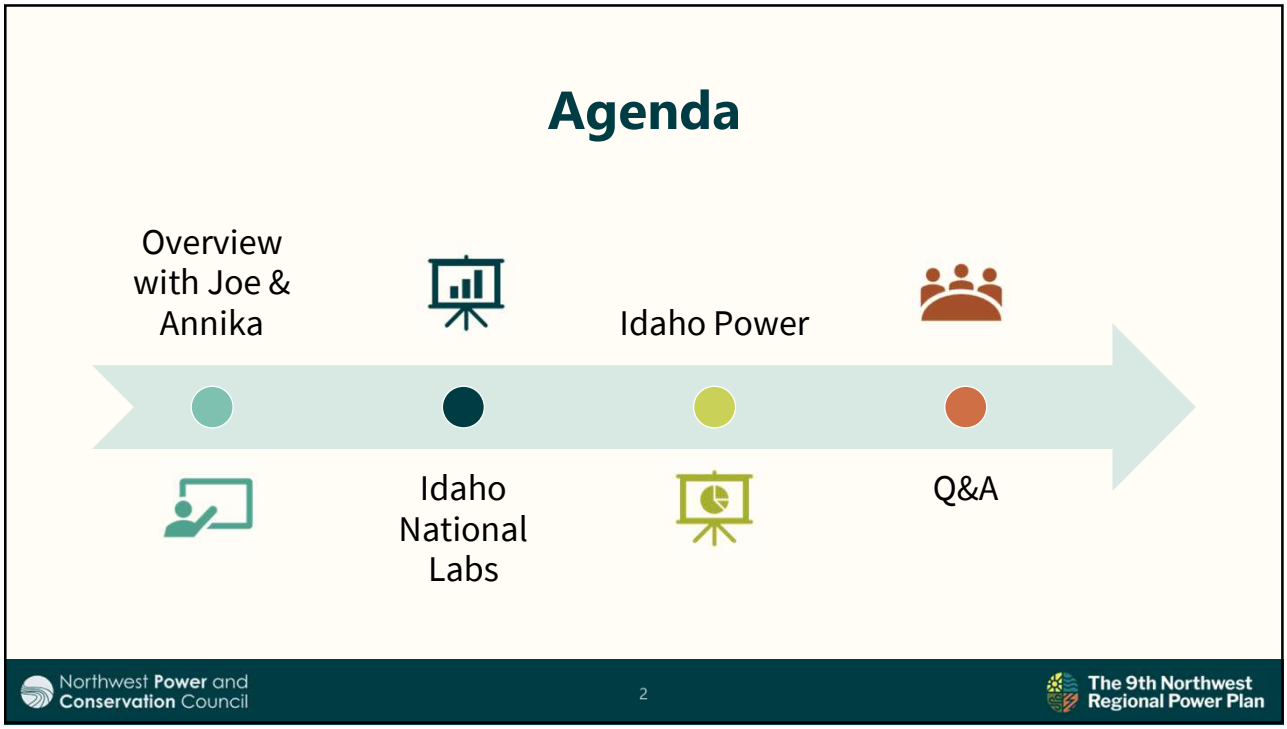
Agenda
Overview with Joe & Annika
Idaho National Labs
Idaho Power
Q&A
Northwest Power and Conservation Council
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The 9th Northwest Regional Power Plan

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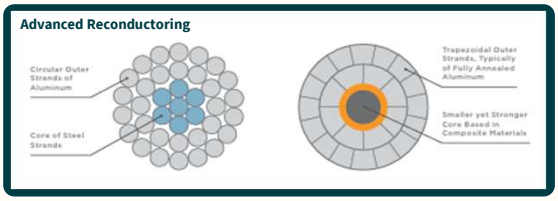
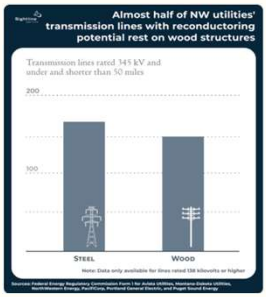
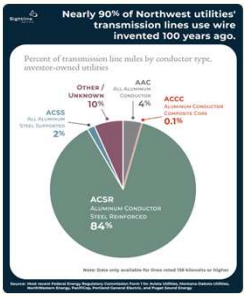
What are GETs?

- Hardware and/or software that can increase the capacity, efficiency, reliability or safety of existing transmission lines
  - Increases transmission capacity and reduces congestion
  - Can be deployed quicker and more cheaply than building new transmission
- Why GETs
  - In a capacity constrained world where big transmission projects are slow to be built but the capacity need is more immediate, grid enhancing technologies and advanced reconductoring can help the region get more out of the existing system in the near term and delay or displace the need for larger infrastructure projects
  - This won't solve all of the region's capacity problems, or entirely defer the need for new transmission, but can maybe help span the gap in the interim







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Types of GETs

GETs Type	Definition	Timing	Capacity Δ	Applicability
Advanced Reconductoring	Replace steel conductor cores with smaller, lighter composite cores Enables higher operating temps and avoids additional line sag	18-36 months	About 2x increased capacity	Lines with capacity constraints caused by thermal limitation (ie short lines, <50 miles, up to 345 kV) 20% of national transmission lines are viable candidates *(INL advanced reconductoring study)*
Dynamic Line Rating	Real-time calculation of a transmission lines thermal capacity based on local conditions More current can flow through lines on a day with lower temps, low solar radiation, and wind	3-6 months	15-30% increased capacity	Has greatest impact in climates w/ meaningful temp changes and/or high wind speeds
Adv. Power Flow Controls (PFC)/Topology Optimization (TO)	Hardware: uses power electronics to direct power away from congested lines Software: uses AI to reconfigure the grid by rerouting power by opening and closing circuit breakers to divert power from congested lines		PFC: 10-25% TO: 5-50% increased capacity	Best suited for transmission lines below 550 kV Can only be applied to meshed grid configurations (ie systems with multiple paths for power to flow) Economically viable for 50% (PFC) or 90% (TO) of US lines *(DOE Liftoff study)*

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Policy Landscape

Federal—FERC:	Order 2023 (2023): Requires that "alternative transmission technologies" be considered when utilities are evaluating interconnection requests.
	Order 881(2021): Requires transmission owners, both inside and outside of organized markets, to use ambient-adjusted ratings (AAR) to improve the accuracy of transmission line thermal ratings.
	Order 1920 (2024/25): Requires transmission providers to evaluate GETs in the near-term and long-term regional planning processes.
	Senate bill S.3918/HR.2703 (The Advancing GETs Act)—Proposed: would require FERC to establish a shared saving mechanism for GETs and require transmission owners to report congestion data if passed.

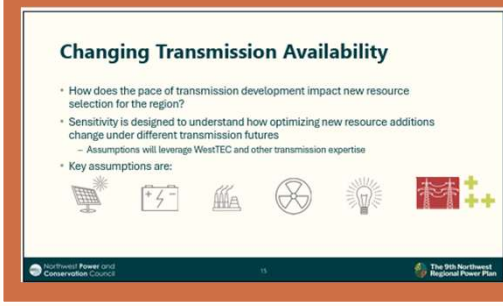
Region		
	Washington: 	SB5466 (2025): Allows WA UTC to provide an incentive rate of return for utilities investing in grid-enhancing technologies and advanced transmission upgrades. Also exempts certain powerline upgrades and reconductoring projects from the State Environmental Policy Act if the stay within existing rights-of-way, though still requires them to notify the DAHP and consult with local tribes before beginning work.
	Oregon: 	HB3336 (2025): Requires power companies to file a plan for using GETs with the OR PUC identifying which grid-enhancing updates are most cost-effective and can be carried out by January 2030. Also requires local governments to review certain GETs applications without public hearings, to ease their installation.
	Montana: 	SB301 (2025): Streamlines the regulatory process for building or upgrading transmission facilities rated over 69kV, empowers the MT public service commission to evaluate proposals within a 300-day window.
		HB729 (2023): Allows utilities to seek rate recovery for advanced conductor deployments if they deliver quantifiable benefits.

GETs in the Plan

- Not representing any grid enhancing tech or reconductoring as a competitive resources in the plan
  - Why?
    - We are not transmission engineers
    - The implementation of these technologies is varied and often very specific to the need of the utility doing the implementing and the characteristics of the line being enhanced
- However, that doesn't mean GETs will be left out of the Plan
  - WestTEC: any reconductoring or GETs included in the WestTEC transmission resource we're capitalizing on will be included in our modeling
  - Scenario modeling *will* reveal things about transmission needs, leaving a space to discuss GETs in the narrative of the Plan
    - There may be resource selection results that could be similarly served by enhanced transmission (like small-scale batteries being built to get around known congestion points)
    - There are things to be learned from the varied transmission looks in scenario analysis

Resource and Transmission Risk Scenario

Reminder:



- The changing transmission availability sensitivity aims to test how more or less transmission impacts resource builds
- Upgrade projects represented in the Transmission Plus sensitivity include:
  - Upgrades to M2W
  - Cross Cascades North & South
- GETs can be a piece of that solution
  - GETs can be deployed more quickly and cheaply than entirely new transmission projects

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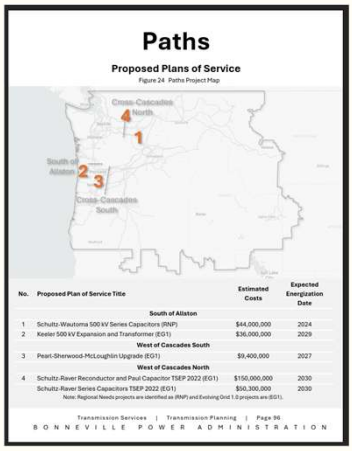
Transmission Plus:

Based on WestTEC 10-year priority projects



North Cascades	•Schultz-Raver Reconductor & Paul Capacitor (2030) •Schultz-Raver Series Capacitors (2030)
South Cascades	•Pearl-Sherwood-McLoughlin Upgrade TSEP (2027)
M2W	•New Moose Gully Compensation Substation •Wire replacement on Dworshak—Taft No. 1 •Substation upgrades/expansions (Hatwai & Bell Substations)

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More Resources

- Idaho National Labs: "Advanced Conductor Scan Report"
- Applied Grid Solutions, ID National Labs
- Utility Perspectives on Making GETs Work, ESIG
- Idaho Power: News Release—"Idaho Power and Pitch Aeronautics Team up to Improve Transmission Capacity"
- EPRI: "Introduction to Grid Enhancing Technologies"
- RMI "GET a GRIP"
- DOE GridLab: "2035 Reconductoring Technical Report"