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# Western Transmission Expansion Coalition "WestTEC"

February 4th, 2026

# Agenda Overview

| Time (PT) | Item | Speaker(s) |
|---|---|---|
| **1:00-1:05** | Welcome | Sarah Edmonds, WPP |
| **1:05-1:10** | WestTEC 10-Year Promotional Video | Sarah Edmonds, WPP |
| **1:10-1:15** | WestTEC Overview | Sarah Edmonds, WPP |
| **1:15-2:15** | 10-Year Horizon: Report and Key Findings | Keegan Moyer, Energy Strategies |
| **2:15-2:30** | 20-Year Horizon: Study Update | Keegan Moyer, Energy Strategies |
| **2:30-2:55** | Q&A | Sarah Edmonds, WPP<br>Keegan Moyer, Energy Strategies |
| **2:55-3:00** | Action Items and Next Steps | Sarah Edmonds, WPP |

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# WestTEC 10-Year Promotional Video

Link

# WestTEC Overview

# Western Transmission Expansion Coalition – "WestTEC"

- *West-wide 10 and 20-year transmission study*
- *Industry-led with unprecedented regional partner inclusion*
- *Goal is to produce an actionable transmission study*


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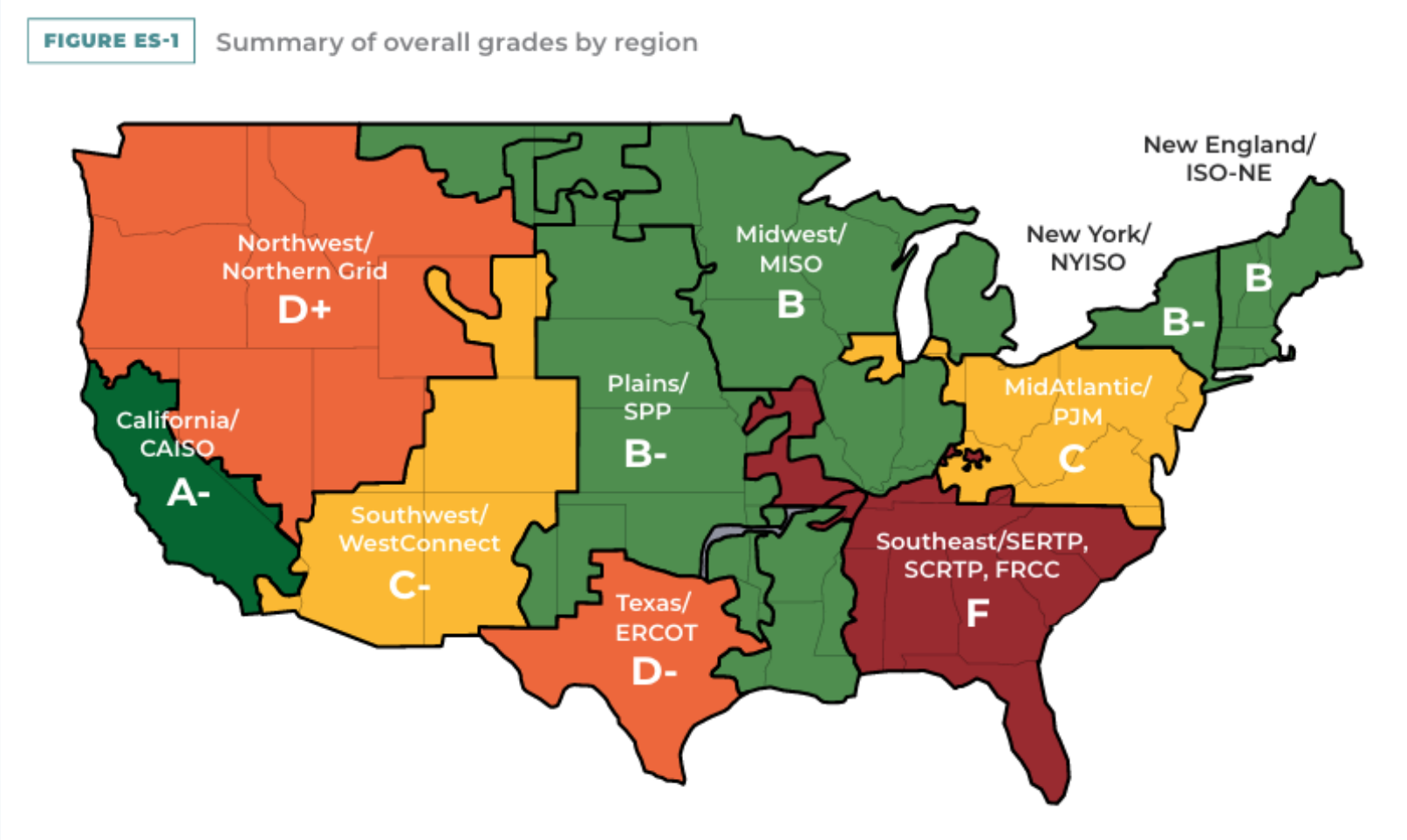
*"...[I]n the West, the Northwest and Southwest along with California are participating in ...WestTEC, a voluntary, west-wide transmission planning process that has broad stakeholder participation and is currently one of the best interregional transmission planning practices in the country."*




*Source: Americans for a Clean Energy Grid, 2025 Transmission Planning and Development Report Card, February 2026*

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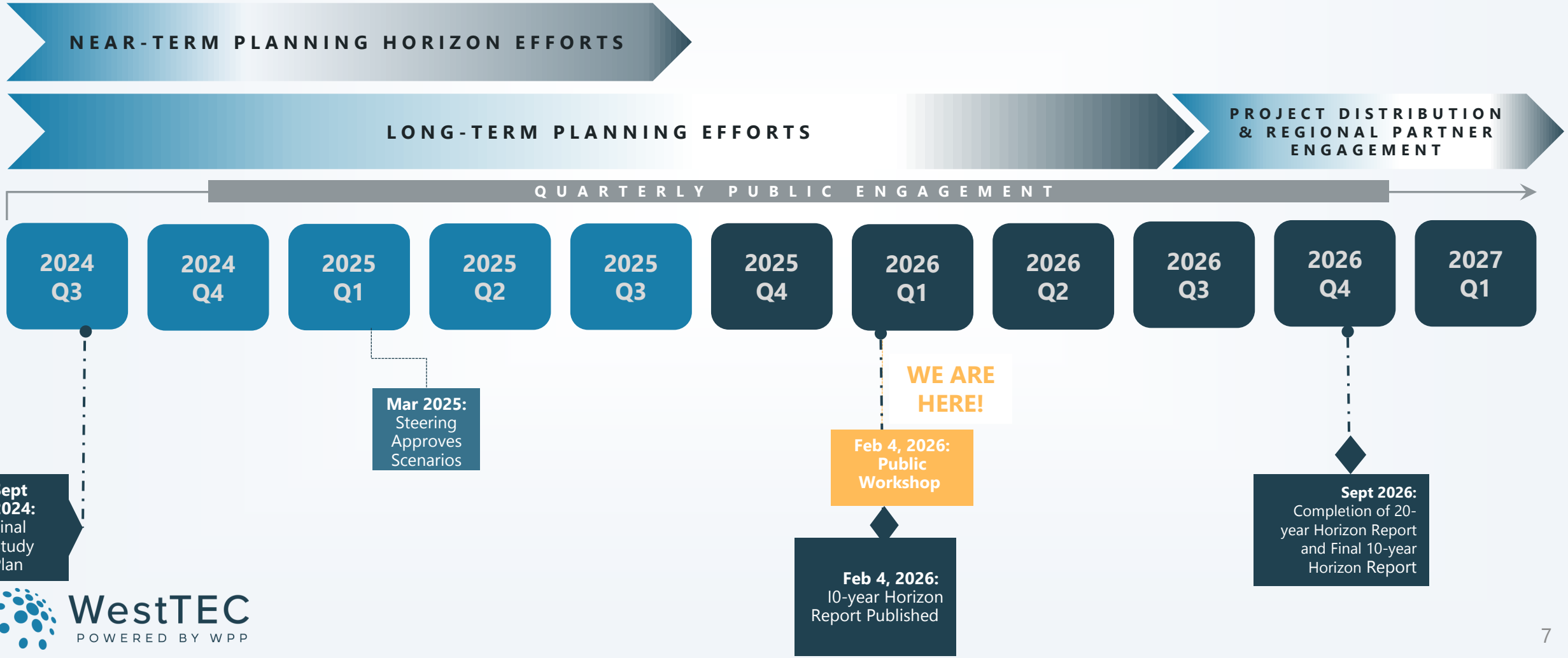
# WestTEC Project Timeline & Future

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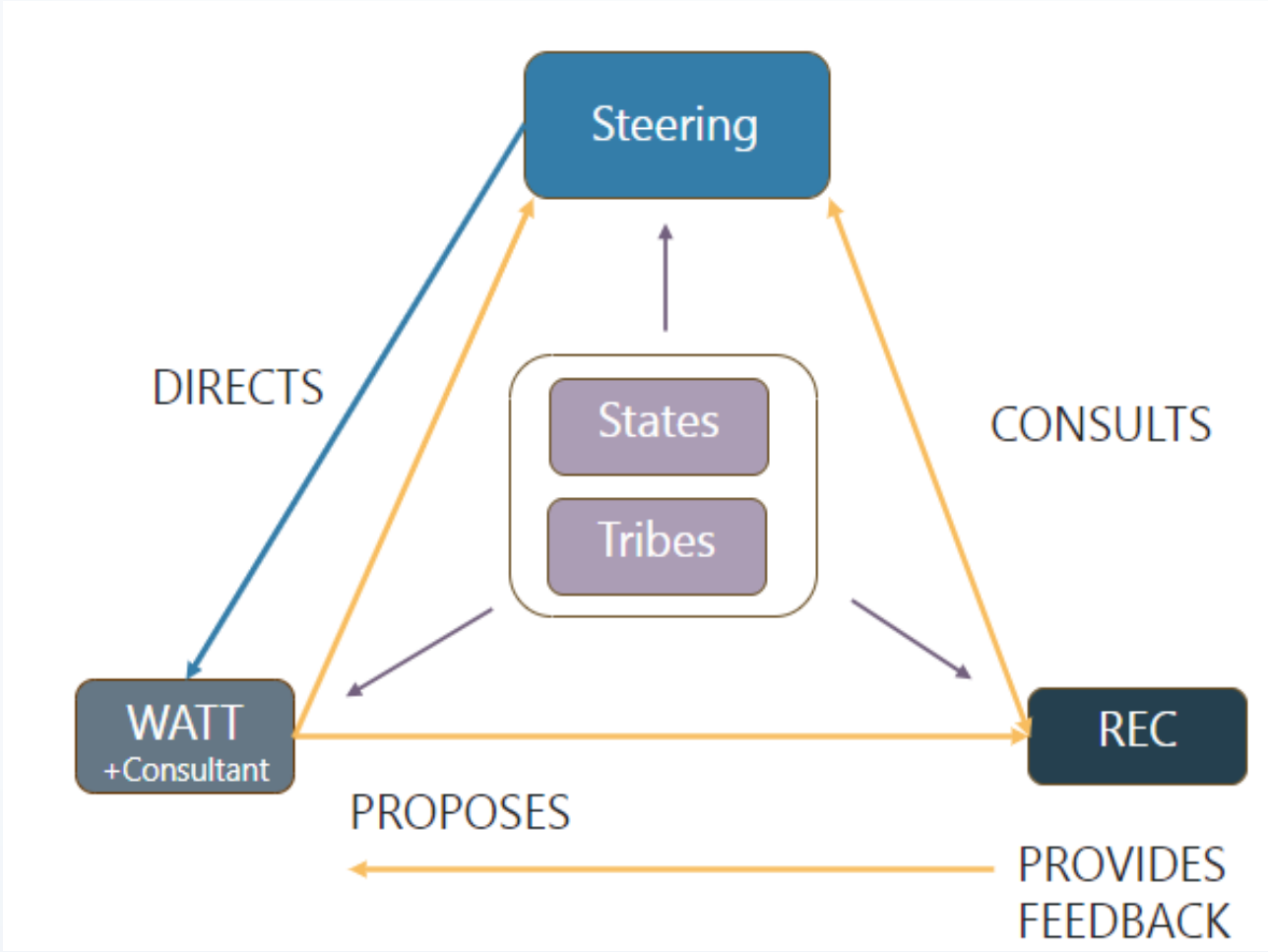
# WestTEC Regional Partners – Over 70+

- Western Interstate Energy Board
- GridWorks
- Western Electricity Coordinating Council
- Connected Grid Initiative
- Wyoming Office of Consumer Advocate
- Public Advocates Office at the California Public Utilities Commission
- Bonneville Power Administration
- Grid United
- Clean Energy Buyers Association
- Amazon Energy
- PacifiCorp
- Puget Sound Energy
- Portland General Electric
- Renewable Northwest
- Snohomish PUD
- Tucson EPC
- Grant County PUD
- *Western Power Pool*
- *GDS Consulting*
- Washington Department of Commerce
- Interwest Energy Alliance
- Invenergy
- Idaho Power Company
- NorthWestern Energy
- NV Energy
- Salt River Project
- Arizona Public Service
- Public Service Company of New Mexico
- Western Area Power Administration
- WestConnect
- NRDC
- Northwest & Intermountain Power Producers Coalition
- Public Power Council
- Colorado River Energy Distributors Association
- LS Power
- Tacoma Power
- New Mexico RETA
- Northwest Requirements Utilities
- PNGC
- Western Resource Advocates
- Clean Energy Transition Institute
- NW Energy Coalition
- From the Light Consulting
- Navajo Transitional Energy Company
- Warm Springs Power & Water Enterprises
- Avangrid Renewables
- EDF Renewables
- Aypa Power
- Grid Strategies
- PG&E
- Southern California Edison
- Seattle City Light
- Black Hills Energy
- LADWP
- GridLab
- The Public Generating Pool
- California ISO
- Southwest Power Pool
- Avista
- Xcel Energy
- Powerex
- BC Hydro
- GridLiance
- Pacific Northwest Utilities Conference Committee
- Pattern Energy
- Cascade Renewable Transmission
- Chelan County PUD
- Pacific Northwest National Laboratory
- Northwest Power and Conservation Council
- Whatcom County PUD
- Savion
- *E3*
- *Energy Strategies*

# Committees, States, & Tribal Engagement

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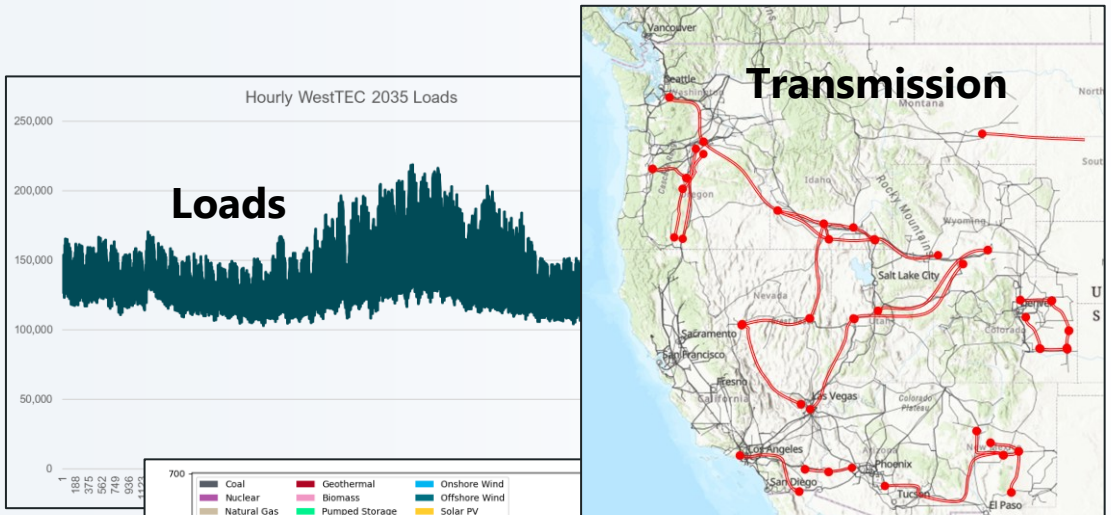
# 10-Year Horizon: Final Report & Key Findings

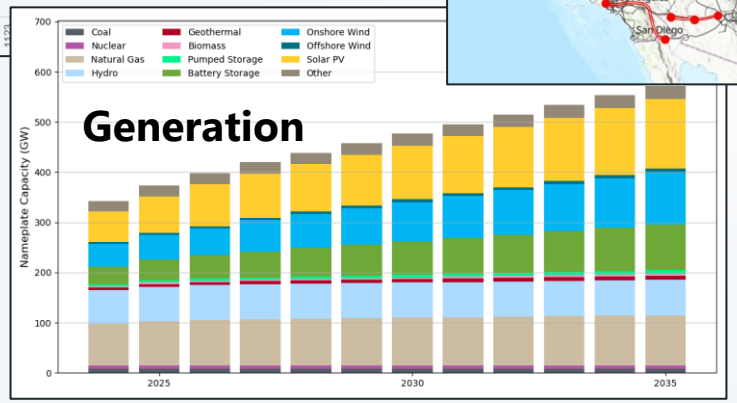
# WestTEC 10-year Horizon Study Framework

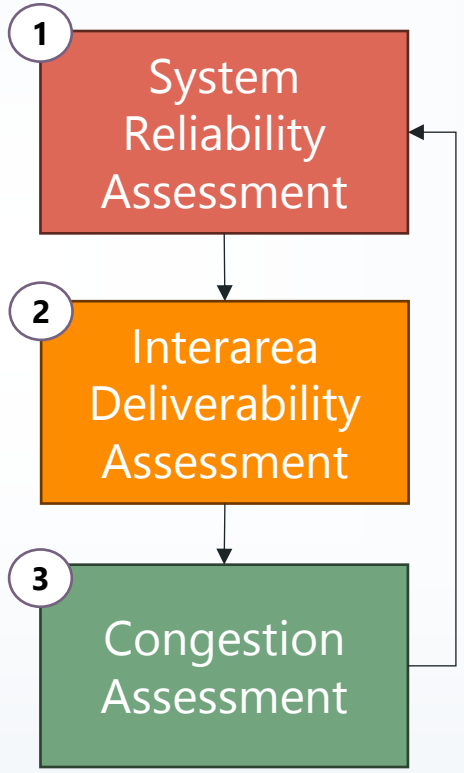
**Regionally consistent forecasts of….**










*Performed serially with bespoke methods on consistent database*

**WestTEC 2035 transmission portfolio**

*Initial portfolio subject to revision based on 20-year results in 2026*

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# 10-year Horizon: Study Purpose and Transmission Drivers

- **Why we are doing this?**
  - Need for a credible, holistic, and integrated evaluation of Western transmission needs
  - Focus on identifying critical interregional transmission gaps and actionable projects
  - Prepare starting point for 20-year horizon with tailored models and methods

- **Drivers of transmission challenges we see over the approaching 10-years:**
  - **Unprecedented load growth.** West-wide peak demand increase of approximately 30% (3x of prior decade).
  - **Resource additions.** Forecasted at 20 GW per year, doubling historical rate.
  - **High interregional power transfers** during critical peaks, cold snaps, etc.

| Metric | 2024 | WestTEC 2035 Reference Case | Change (%) |
|---|---|---|---|
| **Coincident Peak Demand (GW)** | 168 | 219 | **+30% (2.4% per year)** |
| **Annual Energy (TWh)** | 926 | 1,246 | **+35% (2.7% per year)** |
| **Generation Capacity (GW)** | 322 | 551 | **+71% (5.0% per year)** |
| **Transmission 230kV+ (Miles)** | ~98,000 | ~111,400 | **+14% (1.2% per year)** |

# 10-year Horizon: Study Purpose and Transmission Drivers

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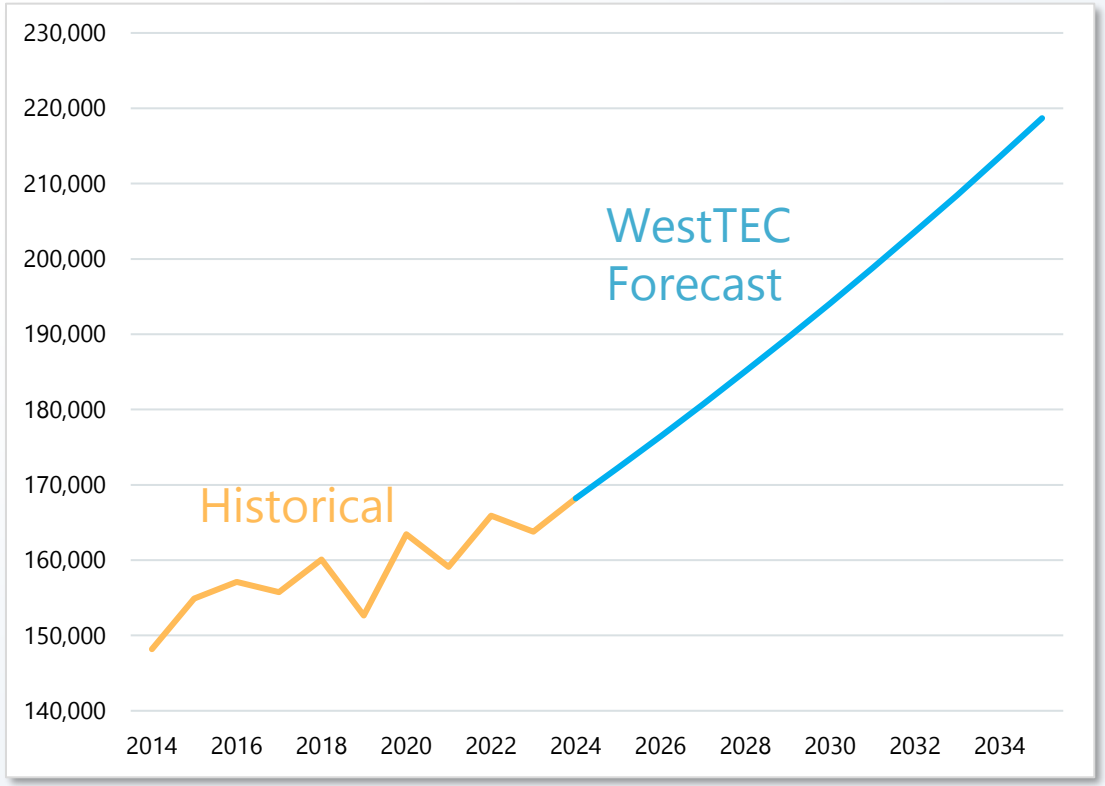
🚨 **Transmission is not keeping pace**

# Critical Input: Load Trajectory

## Load Forecast Developed Through Regional Collaboration

- Load projections were sourced primarily from the WECC 2034 Anchor Data Set (ADS) with refinement based on benchmarking with NREL's scenarios, review at WATT, and data updates from utility participants
- Accounts for forecasted electrification of buildings/transportation, conservative levels of growth in industrial and data center loads (+9 GW), and impacts of demand-side resources
- WestTEC forecasts peak demand to grow at roughly 2.4% over the approaching 10-years, which is more than double this growth rate over the prior 10-years

## Growth in Western Interconnetion Annual Peak Demand (MW)

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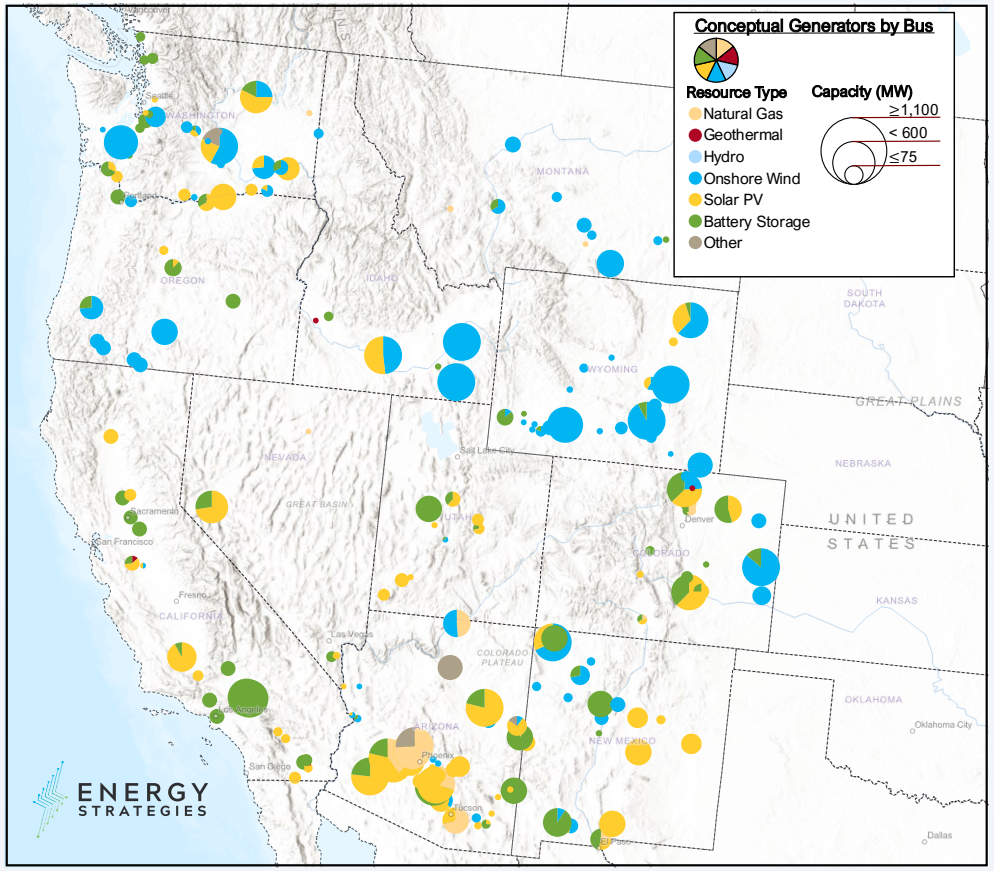
# Critical Input: Resource Mix and Busbar Mapping

## WestTEC 2035 Reference Case Resource Mix (GW)

| Resource Type | 2024 | 2035 WestTEC Reference Case |
|---|---|---|
| **Natural Gas** | 109 | 97 |
| **Hydro** | 75 | 70 |
| **Solar PV** | 44 | 115 |
| **Wind** | 39 | 87 |
| **Coal** | 22 | 9 |
| **Battery Storage** | 16 | 70 |
| **Nuclear** | 7 | 6 |
| **Other** | 5 | 35 |
| **Geothermal** | 4 | 7 |
| **Total** | 322 | 495 |

The "Other" category includes pumped storage, solar thermal, biomass, and alternative-fuel thermal generators.

## Busbar Mapping of Conceptual Resource Additions




WestTEC developed a busbar mapping framework to allocate roughly 87 GW of un-sited conceptual resources from utility IRPs to substations across the region

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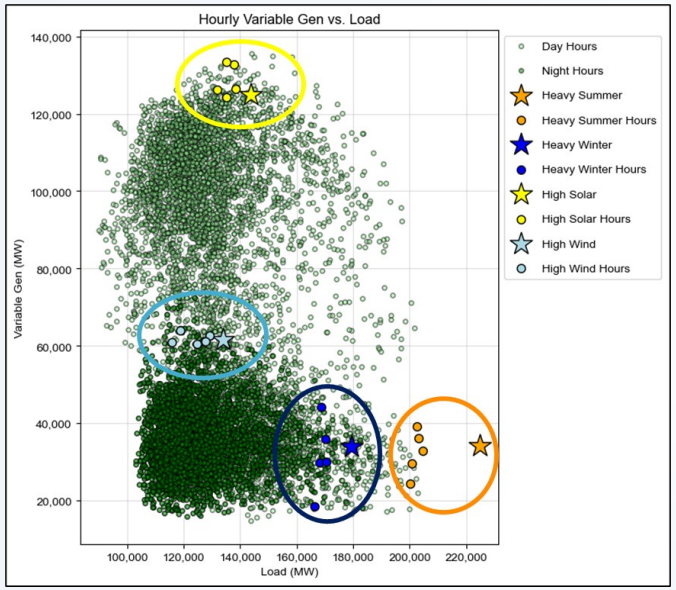
# Critical Input: Study Methods

## System Reliability Assessment

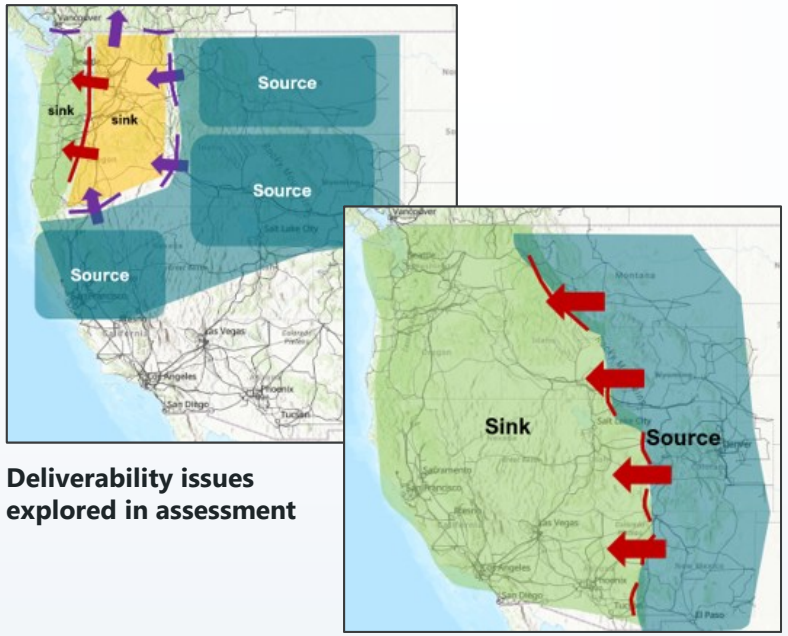
Evaluating reliability under stressed yet credible future conditions that will challenge the grid.




**Four reliability snapshots capture range of conditions**

## Interarea Deliverability Assessment

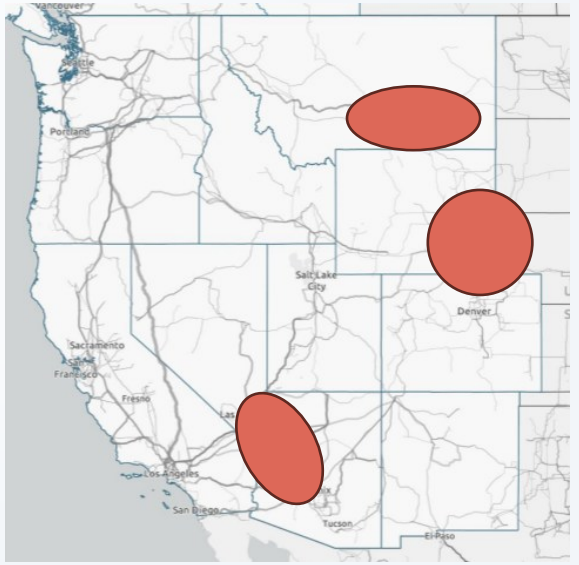
Examines if resources can be reliably transferred when the load and generation diversity of the West must be realized to maintain adequate supply.




**Deliverability issues explored in assessment**

## Congestion/economic Assessment

Identify economic inefficiencies due to remaining transmission constraints.



**Congestion hot spots identified in study**

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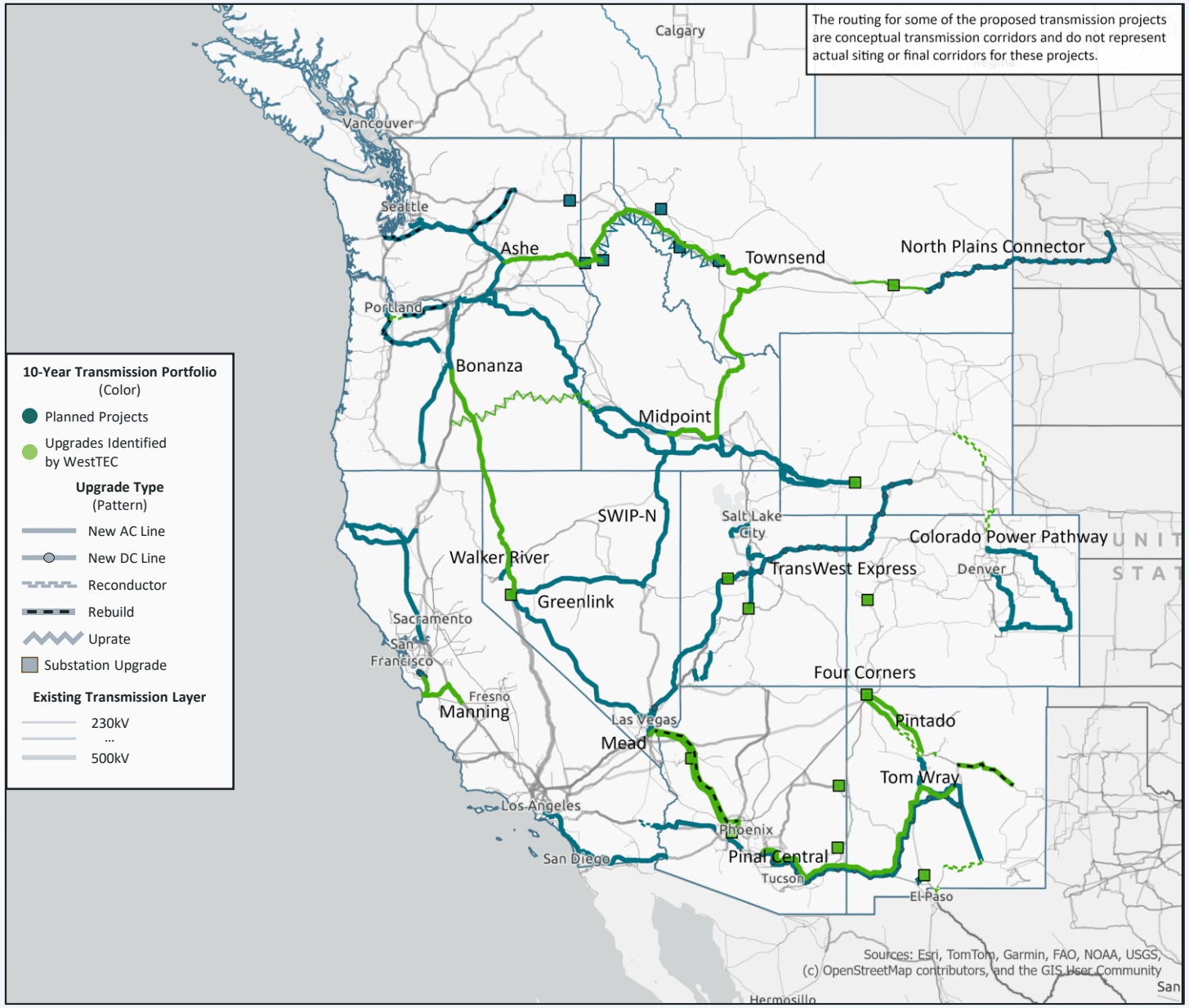
# Stakeholder Impact: Key Areas for 10-year Horizon Study

- Development of Study Plan and refinement of assessment methods
- Siting of future generation resources
- Identification and evaluation of solutions in response to transmission needs
- Interpretation of results and study findings

# 10-year Horizon Transmission Portfolio and Key Findings

# 10-Year Horizon Portfolio:

## All Upgrades

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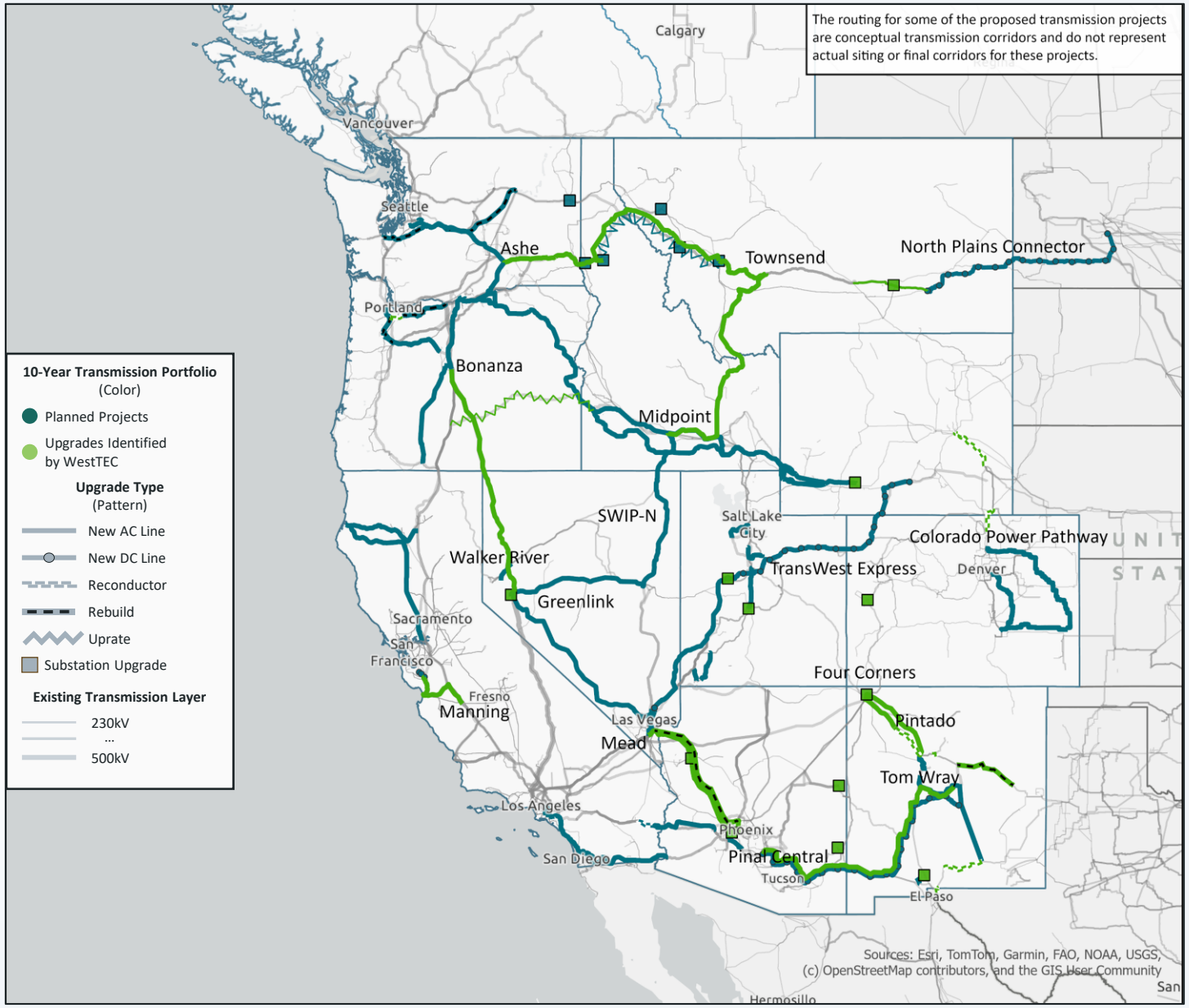
# 10-Year Horizon Portfolio:

## All Upgrades

**Finding #1:**
The 10-year portfolio positions the West to meet growing demand, integrate new resources, and strengthen reliability

Trying to meet utility projections for load growth and resource procurement without interregional transmission investment on this scale would likely have *significant reliability and resilience implications for the West.*

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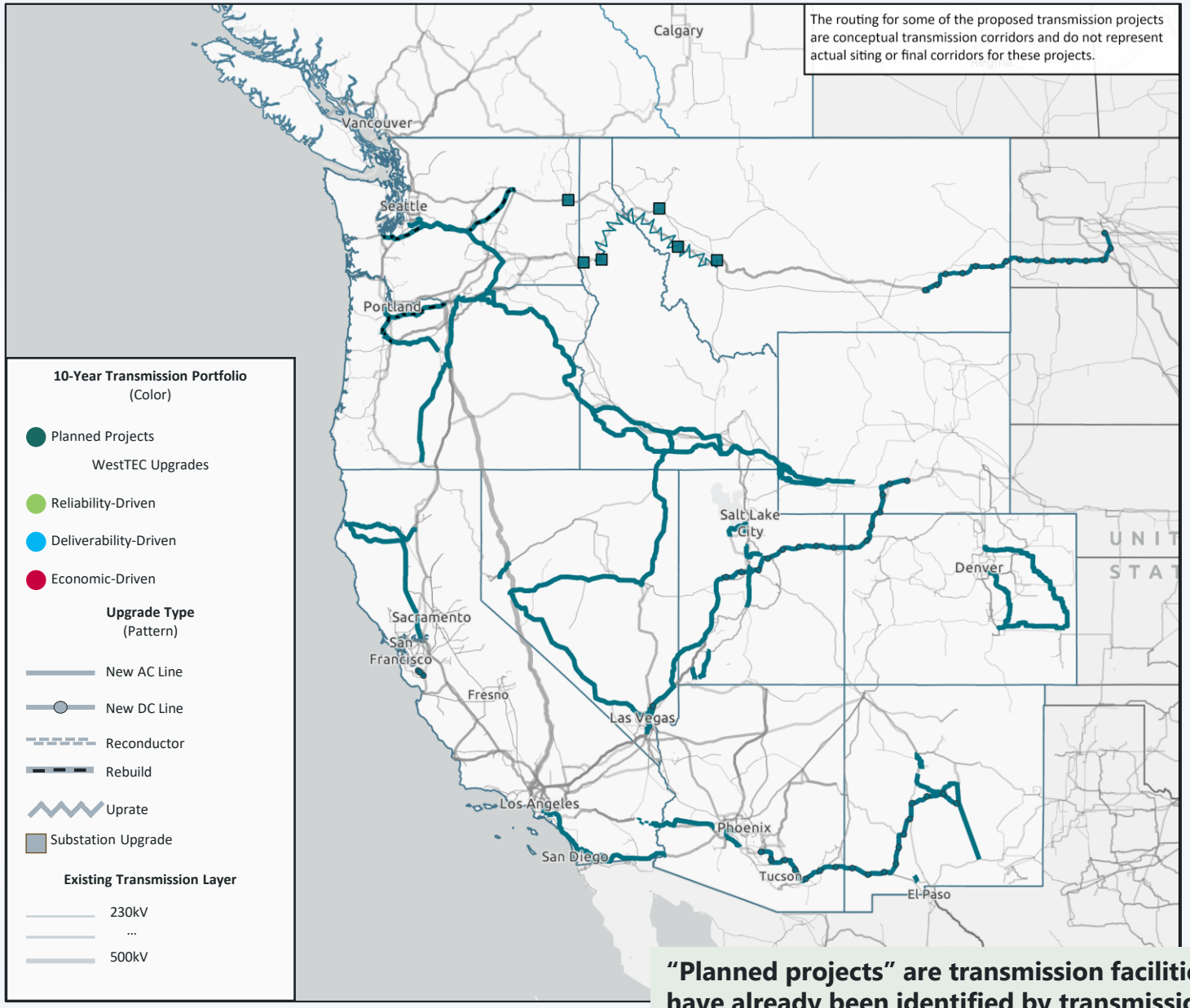
# 10-Year Horizon Portfolio:

## Planned Project Only

**Finding #2:**
Timely completion of planned projects is essential

The coordinated and cost-effective delivery of these 9,358 miles of planned transmission should be prioritized by utilities, developers, regulators, and regional stakeholders.

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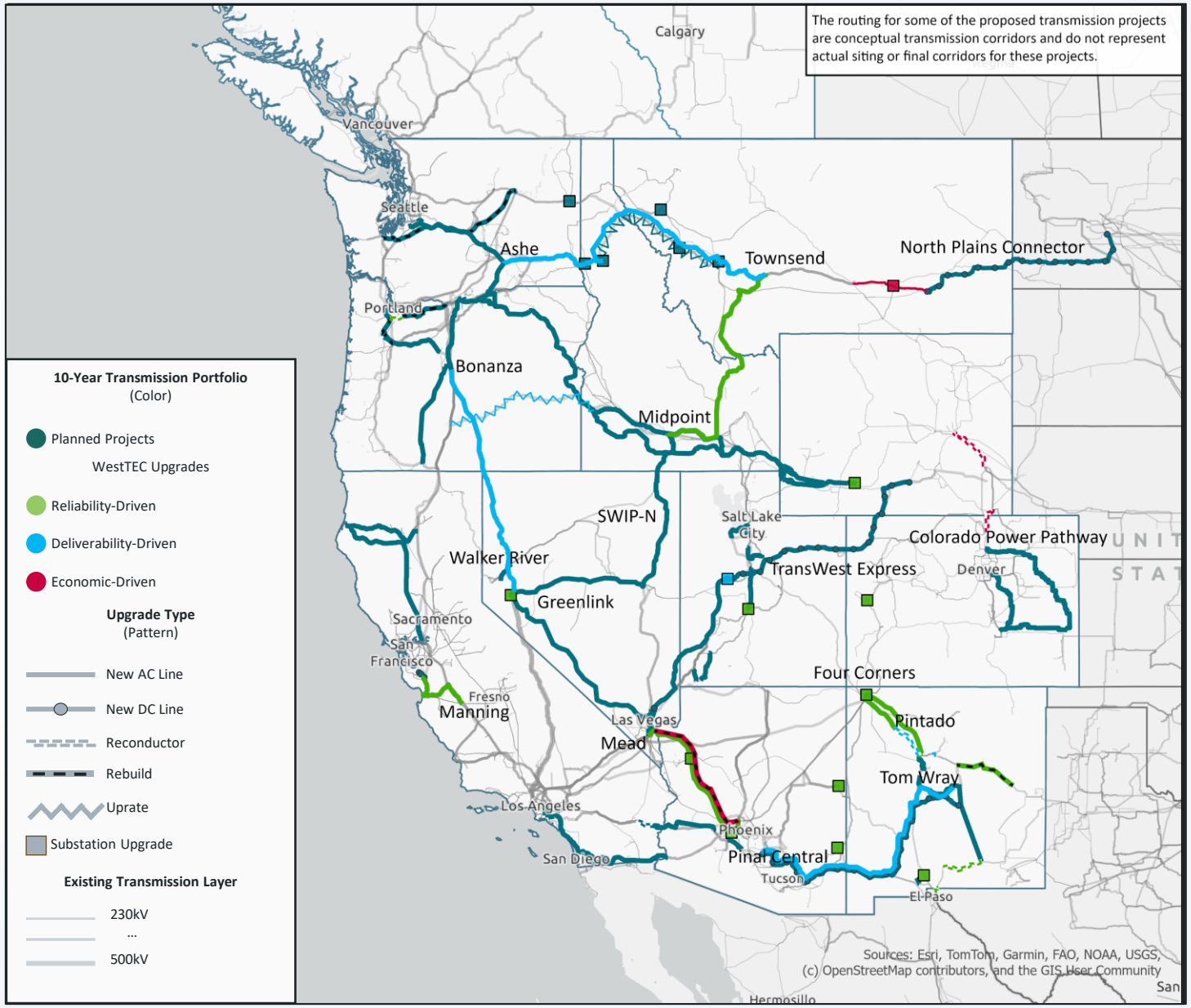
**"Planned projects" are transmission facilities that have already been identified by transmission owners, developers, or regional planning bodies and that exhibit a credible path to implementation**

# 10-Year Horizon Portfolio:

## WestTEC-identified Upgrades Added

**Finding #3:**
Conceptual projects require sponsorship and support

Several high-value projects identified in this study are unsponsored or are at conceptual planning states. These conceptual or unsponsored upgrades address critical interregional needs and require active development on an ambitious timeline.

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# 10-year Horizon Portfolio Summaries and Cost Estimates

- The 10-Year Horizon portfolio includes over 12,600 miles of regionally-significant upgrades or additions with a total cost of ~$60 billion
- About two-thirds of these line miles meet the criteria of planned projects according to the WestTEC study plan
  - Nearly 20% of these are under-construction or are nearing construction
- The remaining one-third of line miles represent upgrades identified as part of WestTEC transmission solutioning efforts

| Transmission Project Category | | Project Count | Total Line Miles | Total Estimated Cost ($M) |
|---|---|---|---|---|
| **Planned upgrades in Portfolio** | | 73 | 9,358 | $46,648 |
| **Upgrades identified by WestTEC in Portfolio** | Reliability-driven | 21 | 1,156 | $6,050 |
| | Deliverability-driven | 8 | 1,742 | $7,239 |
| | Economic-driven | 3 | 394 | $391 |
| **10-Year Horizon Portfolio Total** | | **105** | **12,650** | **$60,328** |

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# 10-year Horizon Portfolio Summaries and Cost Estimates

- Significant portion of the 12,600 line miles upgraded in the portfolio is from development of **planned greenfield lines**
  - This finding speaks to the importance on delivering on these lines, many of which may still have significant development milestones ahead of them
- However, rebuilds of existing lines and reconductoring projects (including advanced conductors) play a key role and help expand grid efficiency at a lower cost per mile

| Upgrade Type | Count | Total Line Miles | Total Estimated Cost ($M) |
|---|---|---|---|
| **10-Year Planned** | **73** | **9,358** | **$46,648** |
| New Line | 53 | 8,457 | $42,125 |
| Rebuild | 11 | 553 | $2,741 |
| Reconductor | 7 | 348 | $687 |
| Substation | 2 | - | $550 |
| Uprate | 1 | 90 | $545 |
| **Congestion** | **3** | **394** | **$391** |
| Reconductor | 3 | 394 | $324 |
| Series Capacitor | 2 | - | $67 |
| **IDA** | **8** | **1,742** | **$7,239** |
| New Line | 3 | 1,425 | $7,052 |
| New Transformer | 1 | - | $41 |
| Reconductor | 3 | 75 | $92 |
| Uprate | 1 | 242 | $55 |
| **SRA** | **21** | **1,156** | **$6,050** |
| New Line | 7 | 947 | $4,834 |
| New Shunt | 2 | - | $26 |
| New Transformer | 8 | 0 | $171 |
| Rebuild | 1 | 110 | $940 |
| Reconductor | 3 | 98 | $79 |
| **Grand Total** | **105** | **12,650** | **$60,328** |

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# Cost Context: How to think about affordability and this portfolio

- WestTEC hopes properly frame the cost of the 10-year Horizon Transmission portfolio
  - Transmission is front-loaded capital that is repaid over decades, which allows benefits to be realized over time
- Using typical financing assumptions, the portfolio is estimated to cost roughly $5.3 billion per year
  - This is quite small as compared to total Western electricity spending, which was nearly $120B in 2024
- **Finding #4**: The 10-year portfolio cost is substantial but financially proportionate and feasible — comparable to other large public works and justified by the durable reliability and resource value it unlocks.

| WestTEC 10-year Horizon Transmission Portfolio Cost Metrics | Cost Benchmarks | WestTEC Transmission Cost vs Benchmark |
|---|---|---|
| **Capital cost = $60 billion** | • Comparable to other megaprojects, such as California's high-speed rail system (~$100B) and three Portland-area bridge replacements (~$12B) | • ~60% of California high-speed rail cost<br>• ~5x the Portland bridge program cost |
| **Levelized cost = $5.3 billion per year** | • Western U.S. customers spend roughly $117 billion annually<br>• GDP of Western states exceeds $7.4 trillion.<br>• The annualized fixed cost of new generation deployment in the WestTEC 2035 Reference Case is ~$44 billion per year | • ~4.5% of today's annual electricity spending<br>• 0.1% of regional GDP<br>• 17% of the annualized fixed cost of new generation |
| **Cost per kWh of electric demand in 2035 = $0.004/kWh** | • The load-weighted average retail price in the West is ~$0.16/kWh. | • ~2.5% of today's average retail electricity price |

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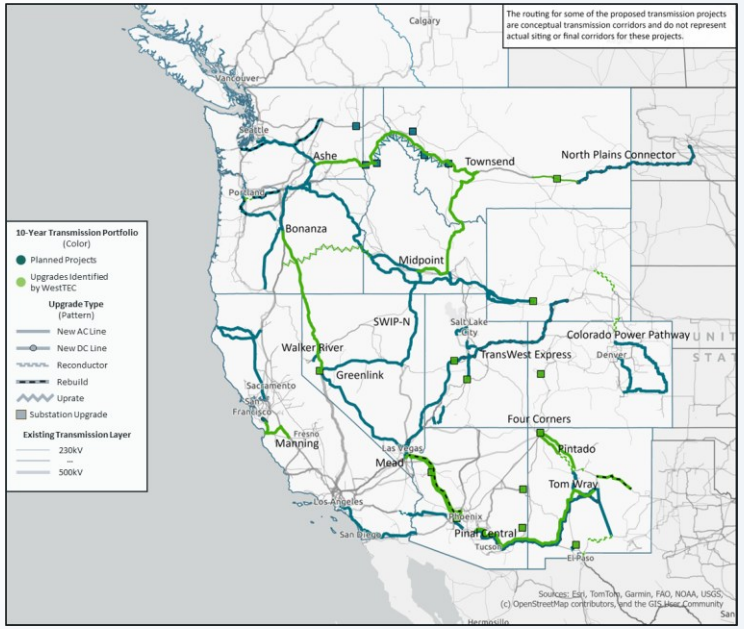
# What does the transmission provide to the Western region?

## The 10-year Horizon portfolio offers….

- Ability for the region to **accommodate over 30% growth in electricity demand** with a portfolio of resources consistent with Western Utility resource plans.
- Support for **10-years of sustained economic growth**.
- **Reduced threat of reliability-driven power supply disruptions** through the mitigation of over 75 steady-state power flow violations that would occur but for the construction of upgrades identified by WestTEC.
- **Operational improvements** relative to planned lines alone, including a $500 million per year decrease in power production costs
- **Reduction in  grid congestion costs** and generation curtailment by 20% and 17%, respectively – these metrics are inherently conservative and do not reflect the full extent of savings and efficiencies that could occur.
- **Ability to reliably transfer an additional ~10 GW of power** across key interregional interfaces during times of system need, which can reduce the risk of power shortages and enable lower planning reserve margins.

## 10-year Horizon Transmission Portfolio



# Implementation and Challenges that Lie Ahead

- **Finding #5: Coordinated Action Can Overcome Development Challenge**
  - Report recommends collaboration on long-lead equipment procurement, regulatory support for early-stage activities, innovative business models, streamlined permitting, and transparent cost allocation and engagement on business case development.

# **10-year Horizon Report:** Recapping Key Takeaways

» WestTEC's participant-led process allowed it to respond to technical findings and deliver an **actionable** 10-year horizon study

» In doing so, it concludes that:

1. The 10-year horizon portfolio positions the West to meet growing demand, integrate new resources, and strengthen reliability
2. Timely completion of planned projects in the portfolio is essential
3. Uncommitted projects require sponsorship and support
4. Transmission costs are manageable in the right context
5. Coordinated action can help overcome development challenges

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# 20-Year Horizon: Study Updates and What to Expect

# **20-year Horizon:** What is different?

- Focus of 2026 is a 20-year horizon assessment, concluding in ~Q3 with publication of report detailing long-term interregional transmission needs for the West
- This assessment:
  - Explores long-term planning scenarios – a solution to address the significant amount of uncertainty facing planners
  - Help understand how transmission needs change in response to planning variables
  - Allows for continued evaluation and right-sizing of 10-year horizon upgrades
  - Identify long-lead transmission that is “least regrets”
  - Forecasts benefits of key transmission portfolios

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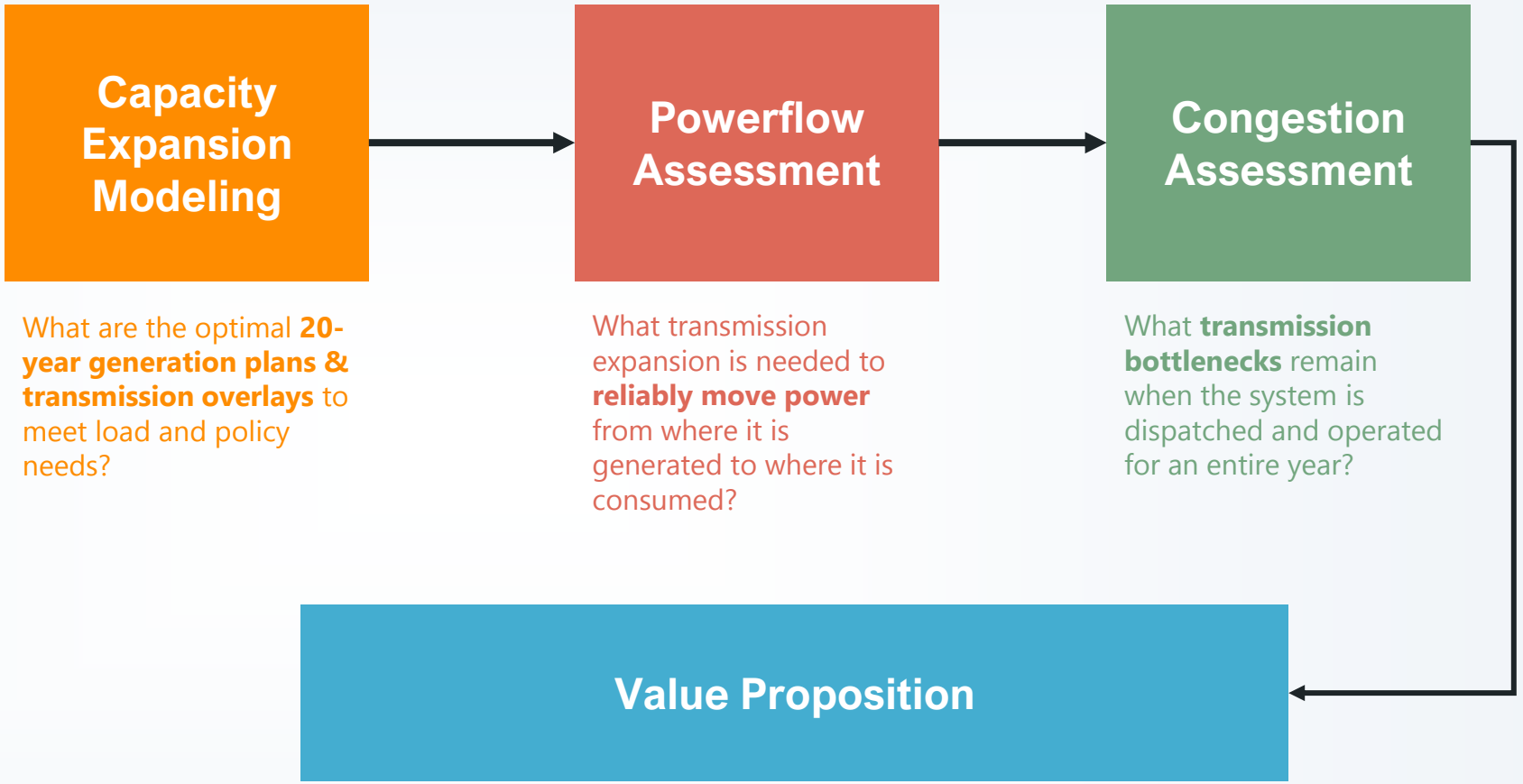
# **20-year Horizon:** Simplified Modeling Platform




What are the optimal **20-year generation plans & transmission overlays** to meet load and policy needs?

What transmission expansion is needed to **reliably move power** from where it is generated to where it is consumed?

What **transmission bottlenecks** remain when the system is dispatched and operated for an entire year?

Given the resulting transmission portfolios, what value do their 'common upgrades' provide, are they robust to certain assumptions, and can they withstand extreme weather events?

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# WestTEC 20-Year Scenarios

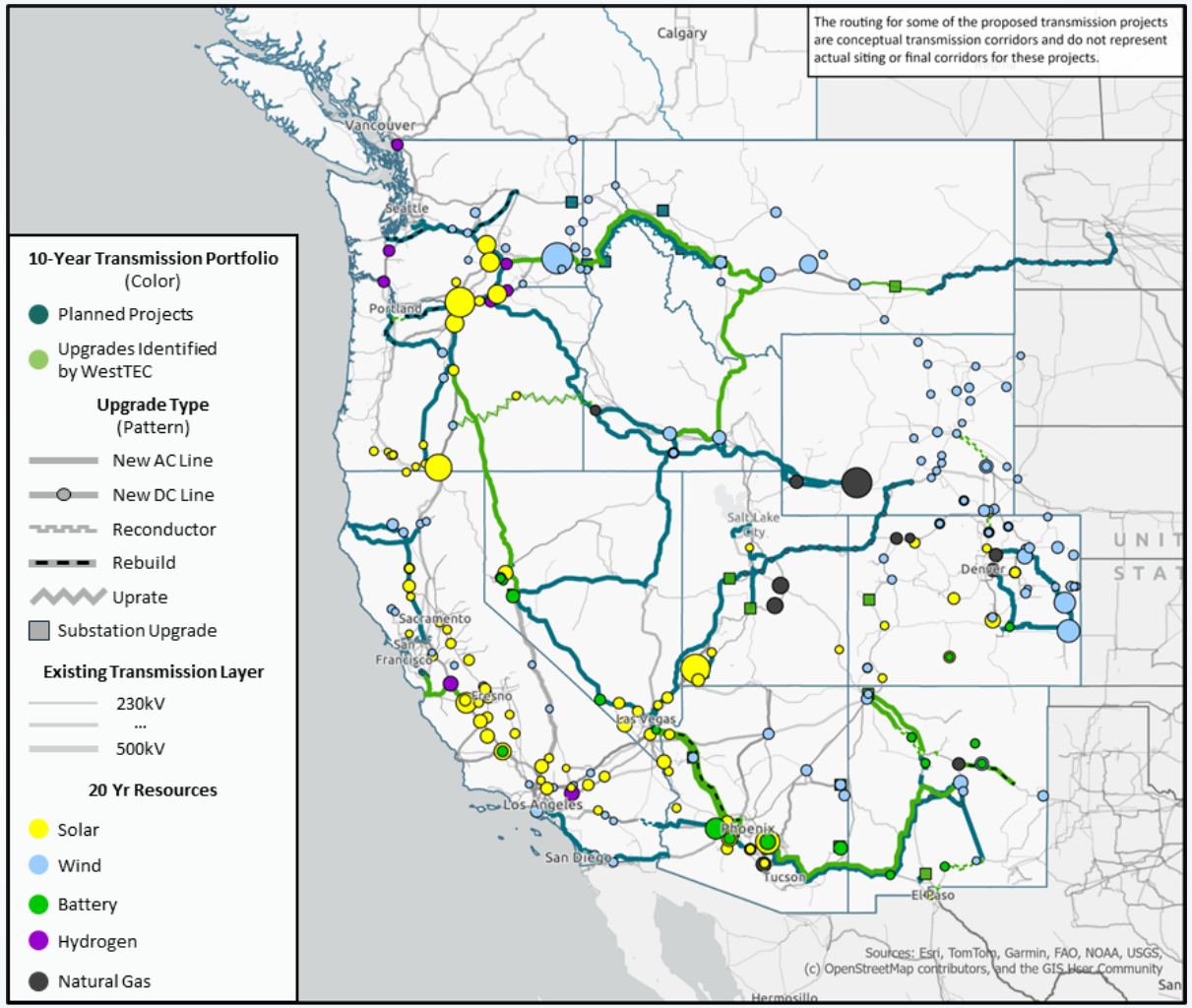
| | Reference | Flux | Core |
|---|---|---|---|
| **Narrative** | **A baseline scenario reflecting reasonably anticipated trends in load growth, technology, and policy** | **A high-growth scenario reflecting rapid changes in power demand and technology innovation** | **A moderate-growth scenario with select technology breakthroughs** |
| **Load Growth (2025-2045)** | 2.2% per year<br>(56% increase) | 3% per year<br>(80% increase) | 2% per year<br>(48% increase) |
| **Technology Costs** | Moderate innovation trajectory | Advanced innovation trajectory | Conservative innovation trajectory*<br>(No Tax Credits)<br><br>*Breakthroughs in Storage, Advanced Geothermal, Nuclear SMRs, and CCS |
| **GHG Policies** | Statutory | Statutory & voluntary | Statutory with 5-year compliance delay |

# 20-Year Reference Case

## Installed Capacity by Type (GW)

| Resource Type | Reference 2035 | Reference 2045 |
|---|---|---|
| Natural Gas | 97 | 113 |
| Hydro | 70 | 70 |
| Solar PV | 115 | 191 |
| Wind | 87 | 138 |
| Coal | 9 | 9 |
| Battery Storage | 70 | 81 |
| Nuclear | 6 | 6 |
| Hydrogen & Other | 35 | 44 |
| Geothermal | 7 | 7 |
| **Total (GW)** | **495** | **659** |

## 20-Year Reference Incremental Resources & 10-Year Transmission Upgrades

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# Overview of Scenario Resources: Installed Capacity by Type (GW)

| Resource Type | 2024 (today) | Reference 2035 | Reference 2045 | Core 2045 | Flux 2045 |
|---|---|---|---|---|---|
| Natural Gas | 109 | 97 | 113 | 115 | 104 |
| Hydro | 75 | 70 | 70 | 70 | 70 |
| Solar PV | 44 | 115 | 191 | 145 | 252 |
| Wind | 39 | 87 | 138 | 99 | 177 |
| Coal | 22 | 9 | 9 | 9 | 9 |
| Battery Storage | 16 | 70 | 81 | 91 | 127 |
| Nuclear | 7 | 6 | 6 | 13 | 6 |
| Hydrogen & Other* | 5 | 35 | 44 | 35 | 66 |
| Geothermal | 4 | 7 | 7 | 7 | 7 |
| **Total (GW)** | **322** | **495** | **659** | **584** | **818** |

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Note: The “Other” category includes pumped storage, behind-the-meter generation, solar thermal, biomass, and alternative-fuel thermal generators.

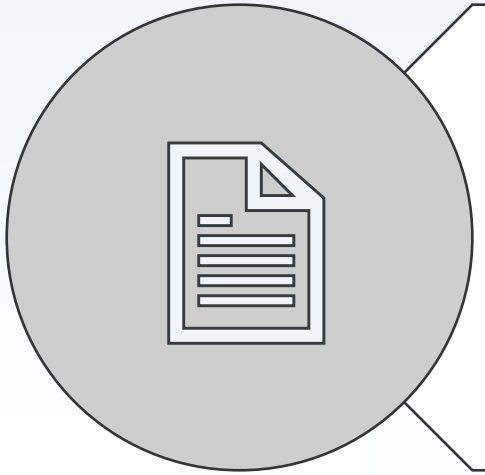
# **20-year Horizon:** Ongoing Work Areas

- Development of 20-year horizon Reference Case models is nearly complete (Q1), with transmission solutioning ongoing in Q2
  - Test studies are underway
- Model development of scenario is underway (Q1 and Q2)
- Other key issues and work streams
  - Hypothesis map development for Reference Case
  - "Busbar mapping" of resources in scenarios
  - Modeling of large point loads across scenarios
  - Refinement of benefit study scope and methodology

# Discussion/Q&A

Admin-WTEC@westernpowerpool.org

# Action Items & Next Steps



**The 20-Year Horizon model building activity has commenced.**

**The 20-Year Horizon Study is expected to be complete by Q4 2026.**

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# Wrap-Up

- This webinar has been recorded and will be posted along with this presentation to the WestTEC website in the coming days at WPP
- Look for the next Public Webinar to be scheduled in Q2 2026
- Thank you for your support and participation!