WestTEC
POWERED BY WPP

Regional Engagement Committee Meeting

June 12, 2025

Agenda

- Welcome and Agenda
- Tribal Engagement Updates
- Updates from E3
- Updates on Energy Strategies/WATT work
- Next Steps
- Public comment

Tribal Engagement Updates

E3 Update

WestTEC 20-Year Reference Scenario Analysis

E3 Capacity Expansion Results

June 12th, 2025

Arne Olson, Senior Partner
Jack Moore, Senior Director
Femi Sawyerr, Senior Managing Consultant

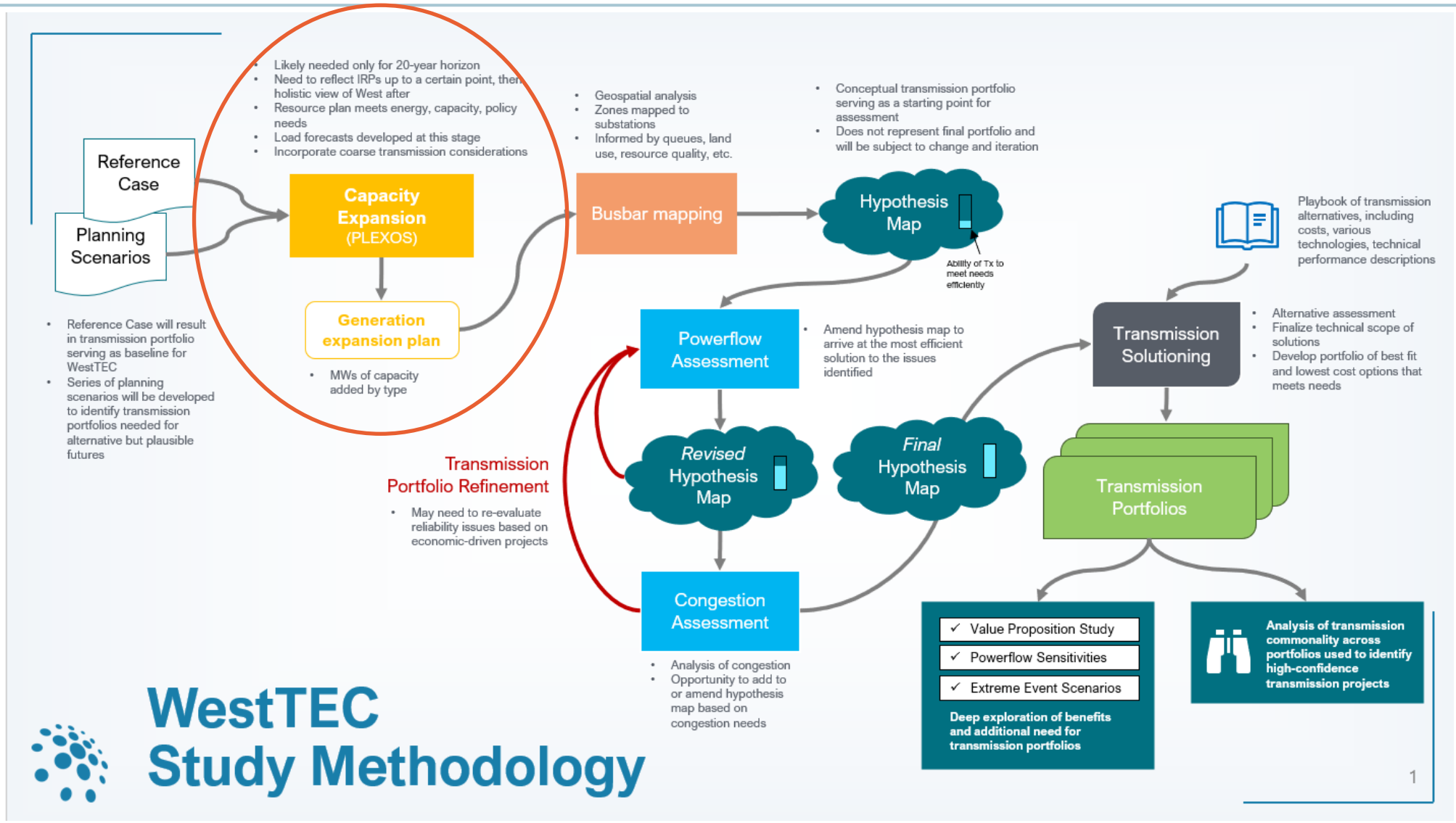
Energy+Environmental Economics

Content

Analytical Background and Scenario Definition

Energy+Environmental Economics

Capacity Expansion Role in WestTEC Project Workflow



Overview of Capacity Expansion Analysis

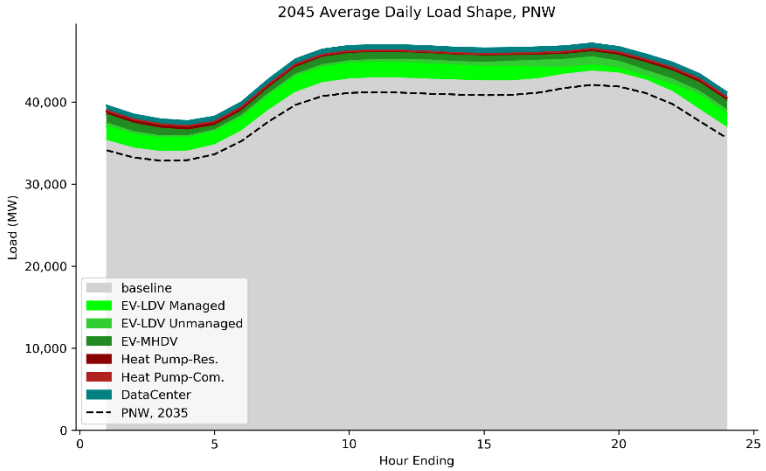
- **E3 is leading the capacity expansion analysis, utilizing the PLEXOS LT model to co-optimize intrazonal generation and storage resource portfolios, and inter-zonal transmission resources over the entire Western Interconnection.**
- **The optimization will create portfolios that will incorporate the following in each of the modeled zones:**
  - Meet hourly load and reserve requirements
  - Respect policy and voluntary goals
  - Respect resource availability limits
  - Result in the lowest Western-system-wide capital, dispatch, and penalty costs (if applicable)
- **The goal of the capacity expansion analysis is to create 20-year resource portfolios for each zone, which:**
  - incorporate generation, load, and transmission information from the 10-year study as base inputs
  - utilize new load forecasts data that are being developed using a bottom-up approach
  - utilize the latest generation, storage, and transmission resource costs and performance assumptions
  - utilize scenario analysis to consider multiple potential future realities

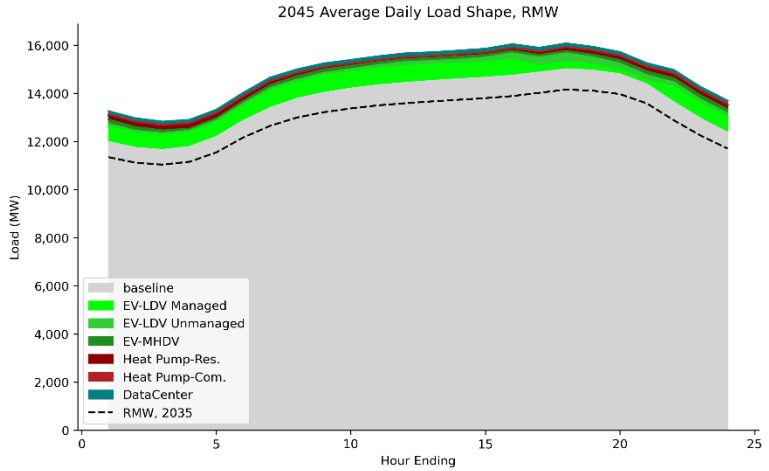
20-Year Reference Scenario Definition

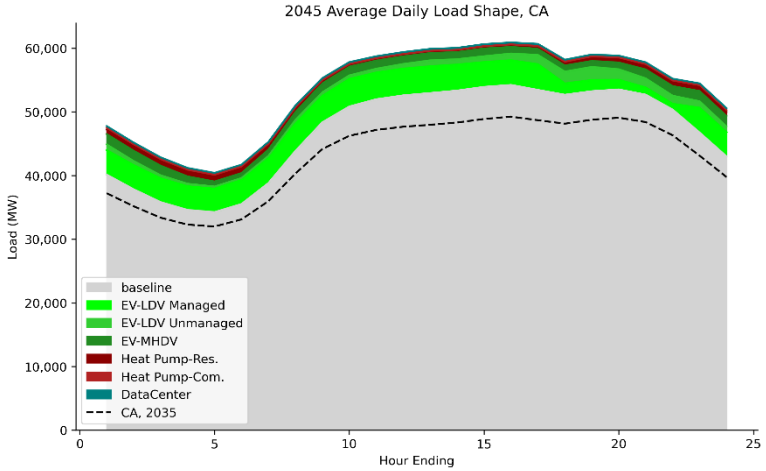
- **The 20-Year Reference Scenario optimizes resource and transmission expansion for 2035 and 2045**
  - The optimization samples 72 days per year with 24 hours per each sample day
- **This 20-Year Reference Scenario uses a load forecast that has a 2.2% CAGR between 2025 and 2045, building on the load forecast used in the 10-Year Reference Scenario**
- **The clean energy standard (CES) adopted represents only the mandatory CES across all the jurisdictions in the WECC**
  - No voluntary utility or balancing area CES commitments are modeled
  - In jurisdictions with no mandatory clean energy standards, all clean energy levels (as a percent share of load) that are achieved by 2035 (in the reference case) are assumed to be preserved through 2045
  - CA, WA, and OR have carbon prices of $57/metric ton in 2035 and $106/metric ton in 2045 (nominal $)
- **Planning reserve margin (PRM) requirements are modeled at a regional level using the perfect capacity (PCAP) method, which can be met by (a) resources located within that region or (b) remote resources selected and specifically dedicate to serve load in that region; regional PRM targets are:**
  - CA – 15.6%
  - Pacific Northwest – 5.6%
  - Rockies – 10.8%
  - Desert Southwest – 12.9%

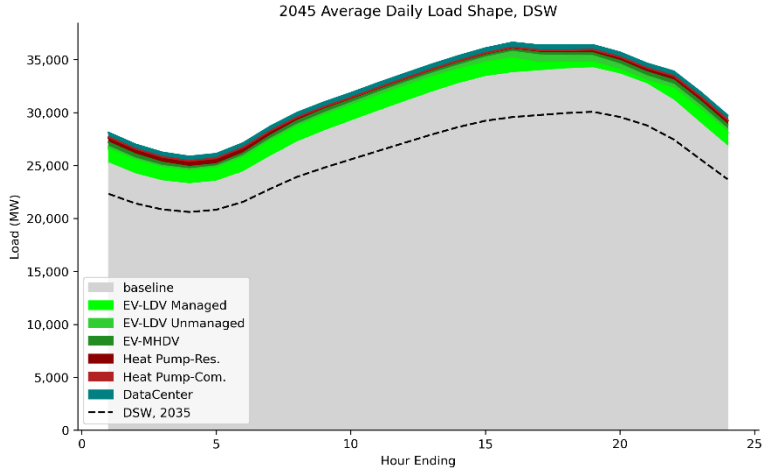
Key Inputs

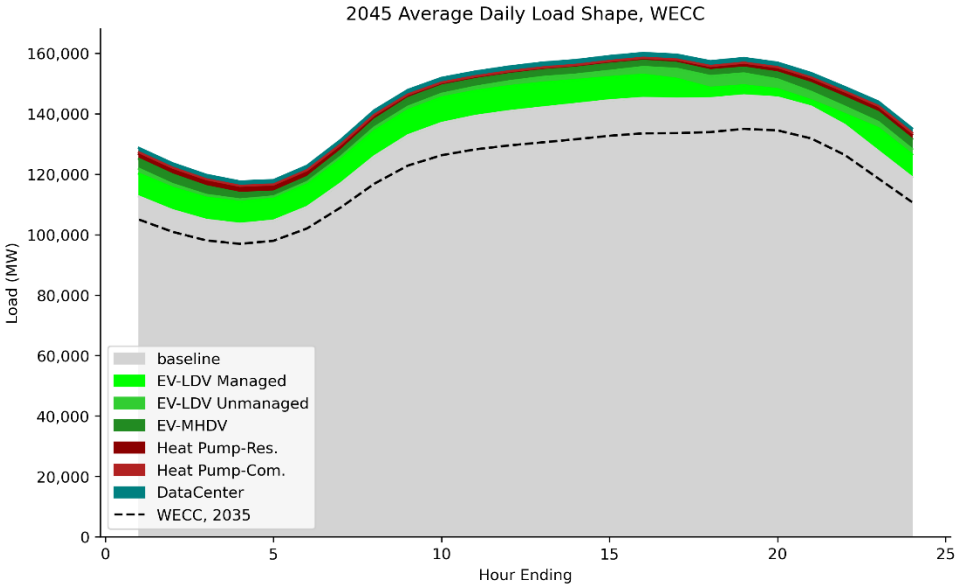
2045 Loads are stacked over the 10-Year Reference Scenario Loads







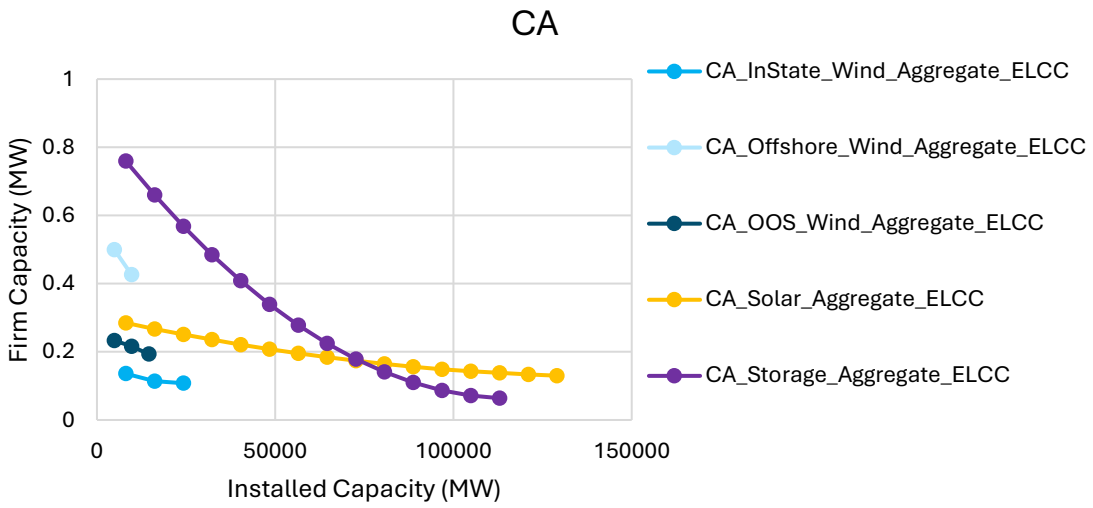


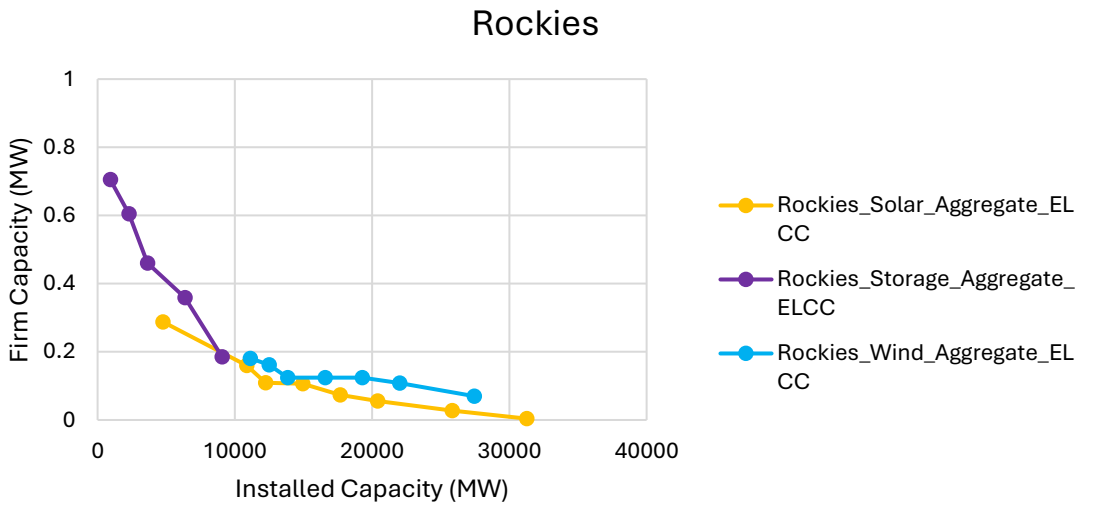


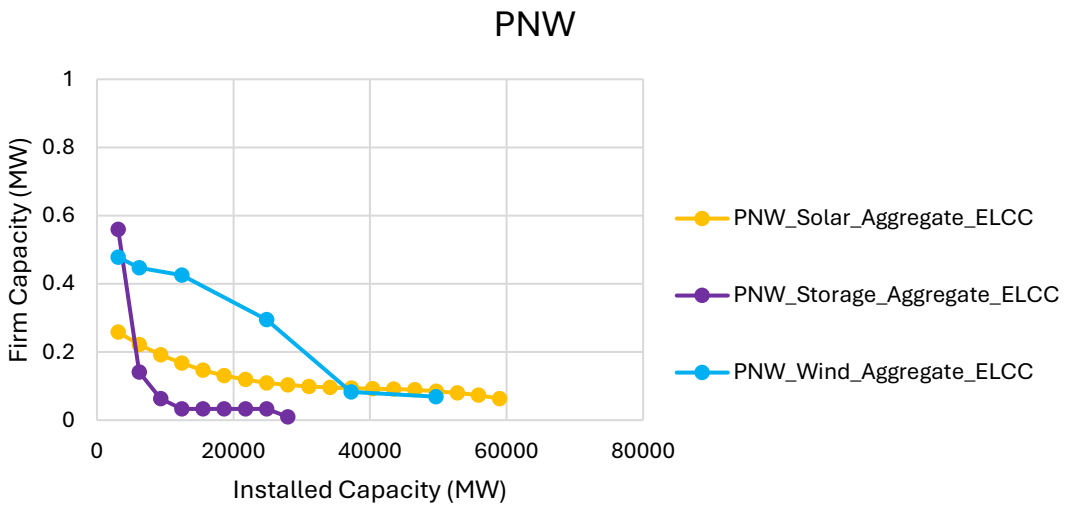
Note: E3 load components above shown for 2035-45 incremental additions

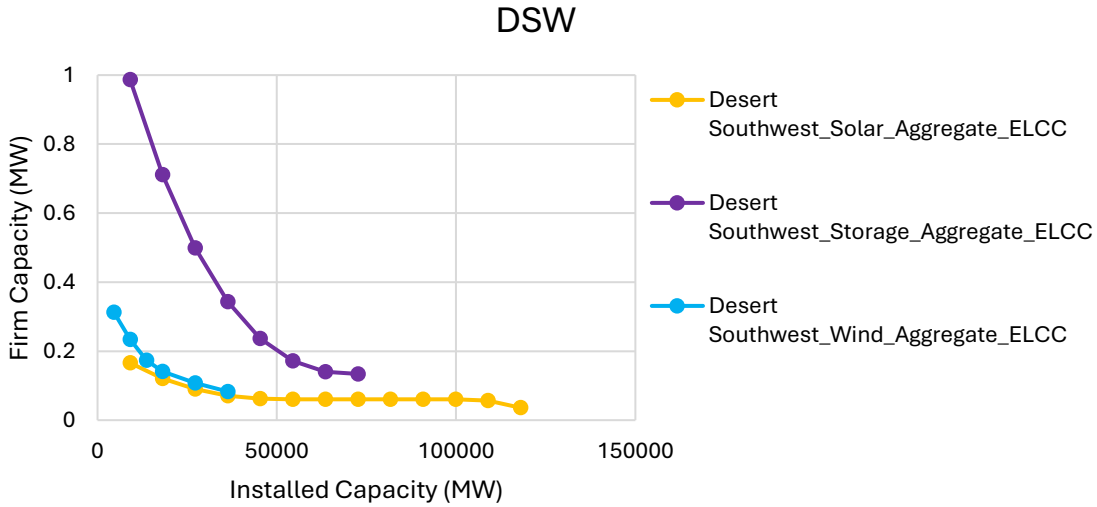
Electrification & data center load components in 2035 ((in previous slide) are included in grey ”baseline” area (broken out in next slide)

Marginal ELCC Curves by Region for Achieving PRM Requirement





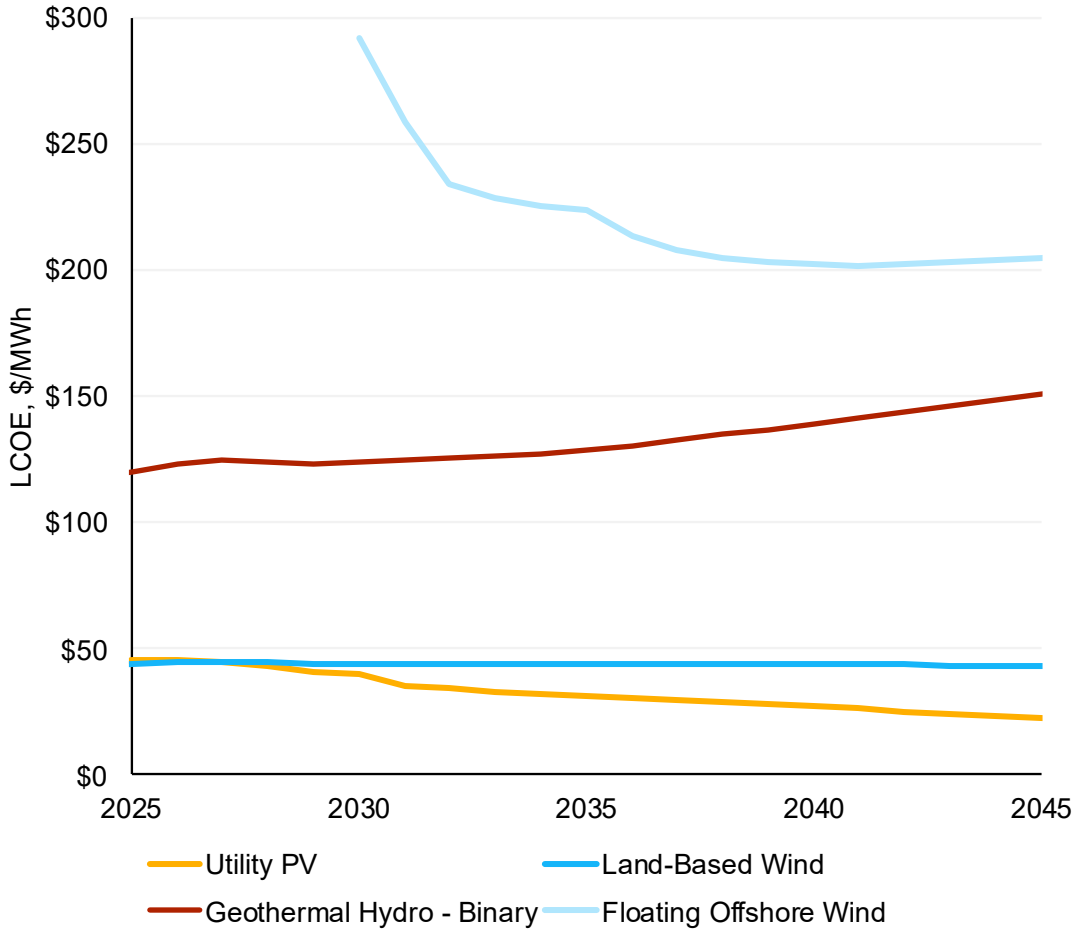




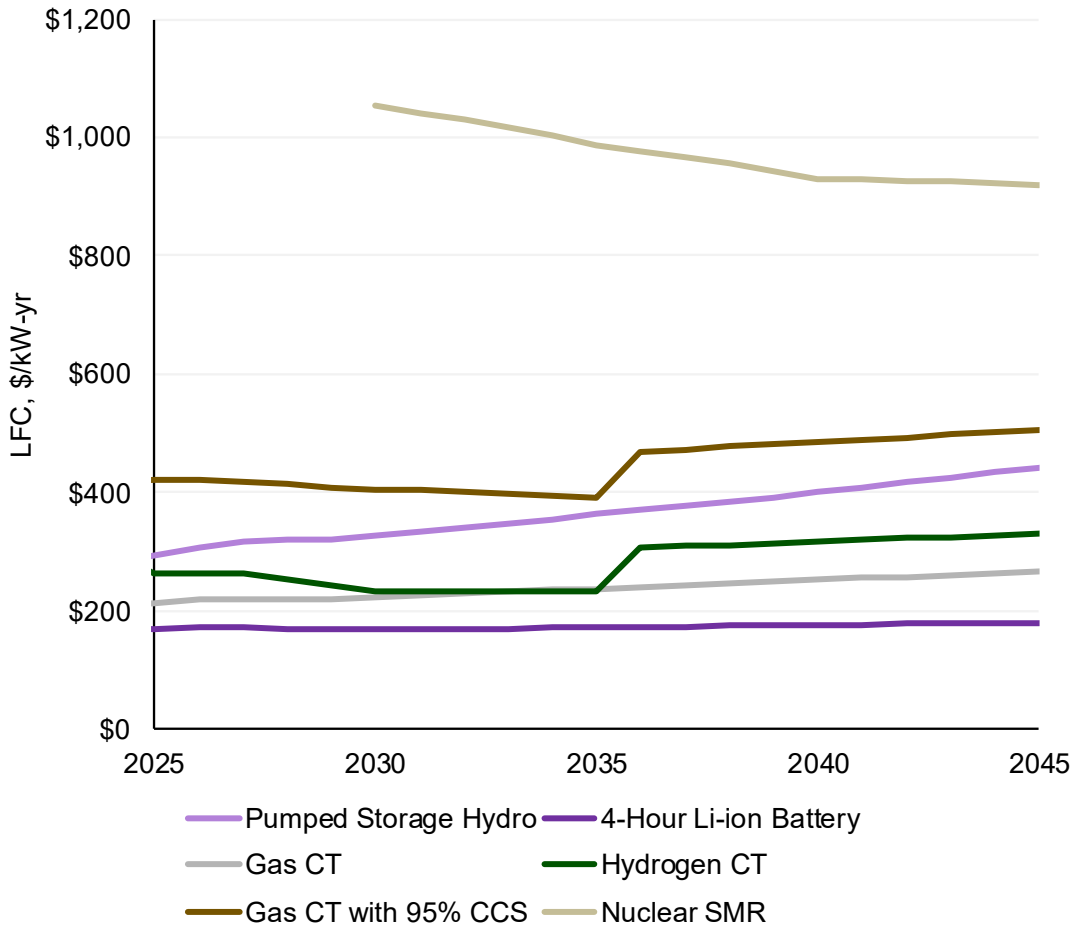
Nominal-Levelized Resource Costs (Average Across Regions)

Years correspond to Project COD (Vintage)

LCOE of Variable Renewable Resources



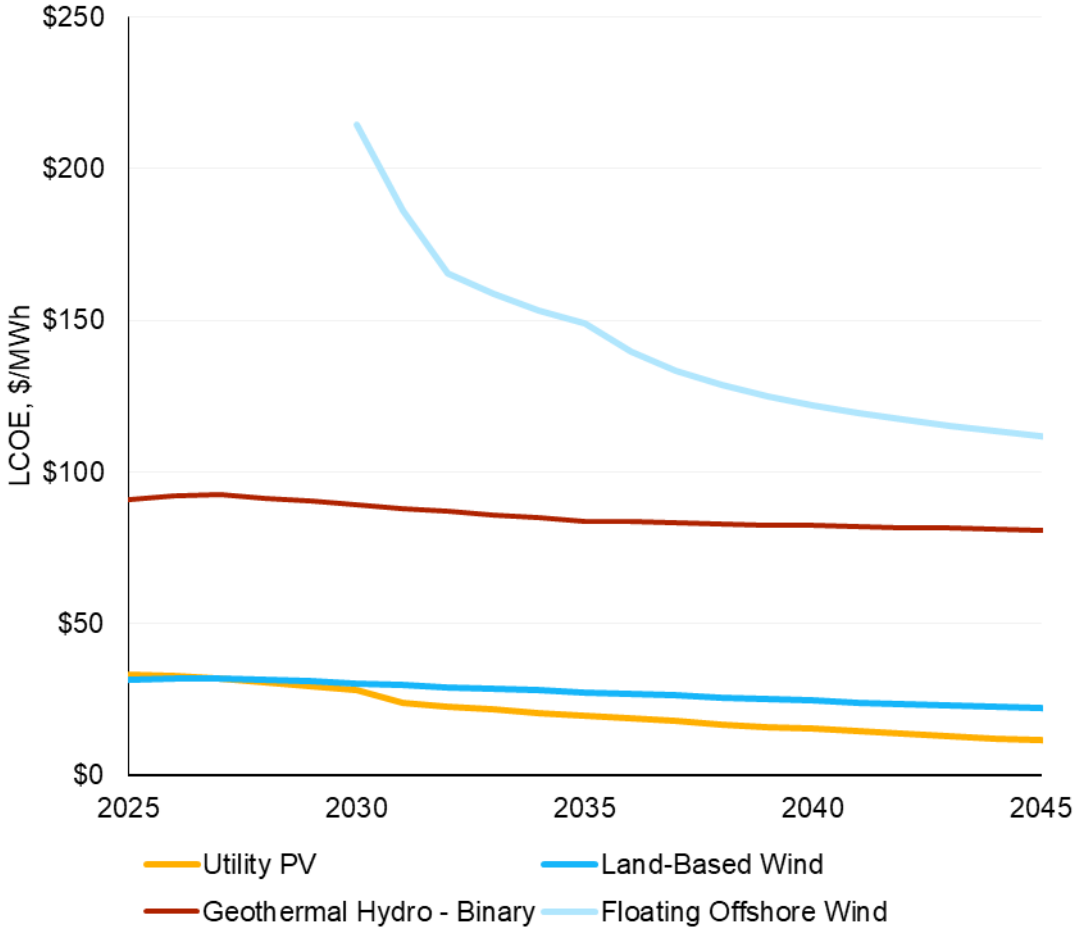
LFC of Firm Capacity Resources



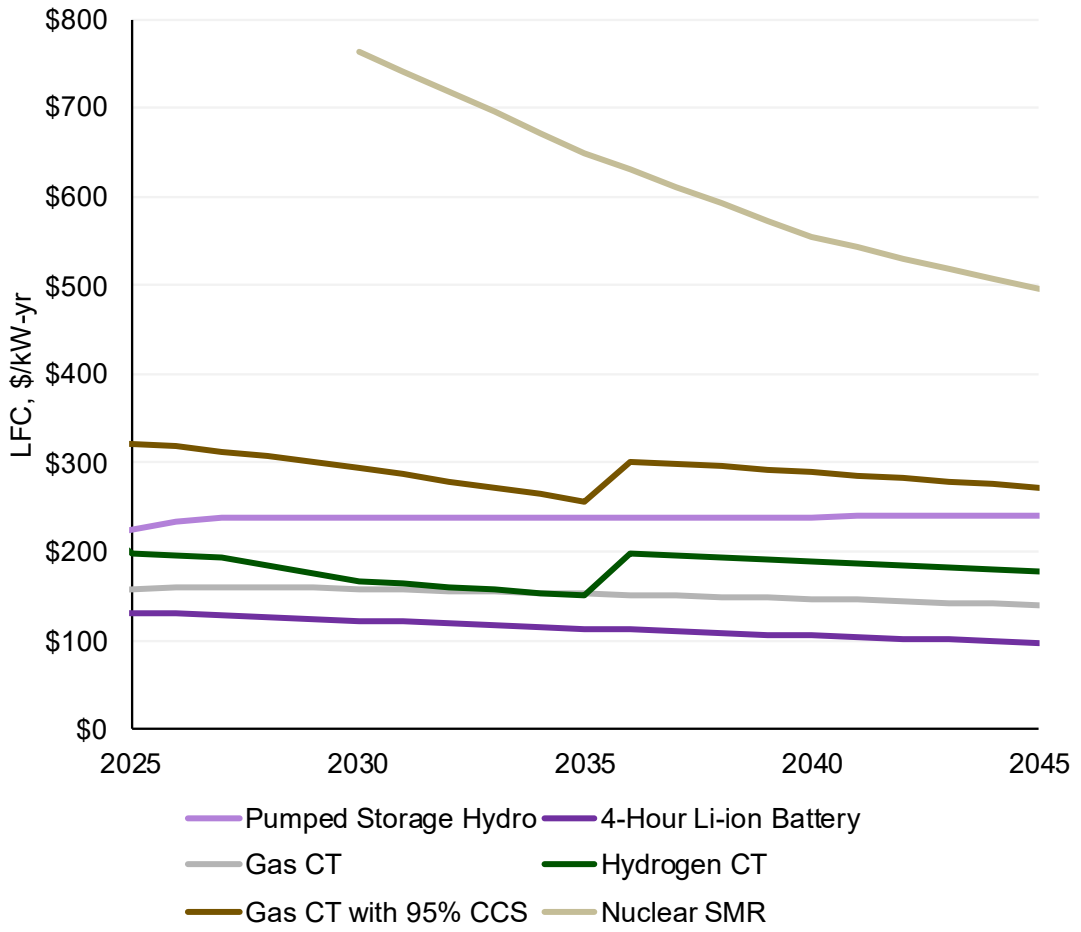
Real-Levelized Resource Costs (Average Across Regions), 2023$

Years correspond to Project COD (Vintage)

LCOE of Variable Renewable Resources



LFC of Firm Capacity Resources

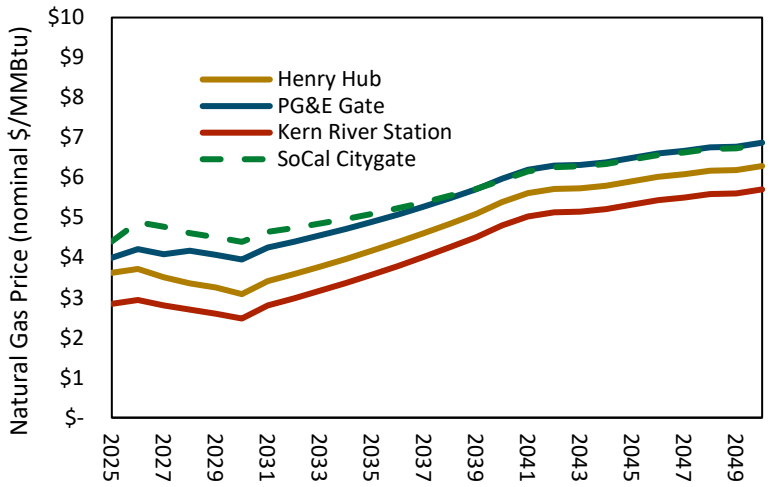


Candidate Resource Availability

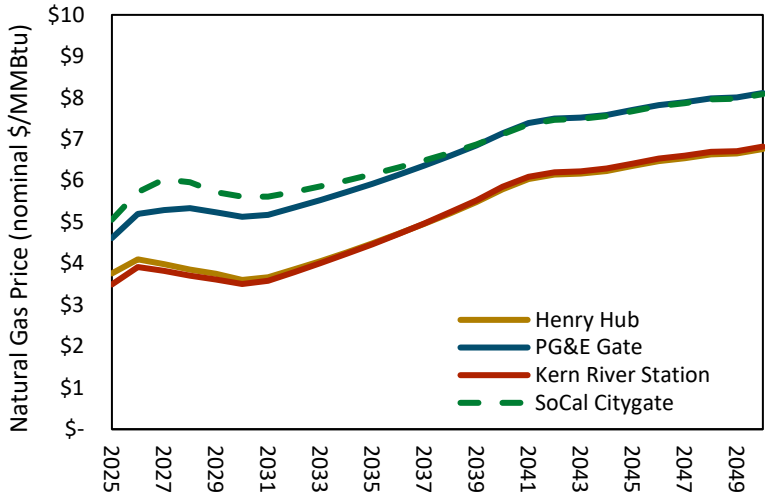
Technology	Notes
Solar	
Wind	Excluded west of Cascades (PNW_NW and PNW_SW)
Offshore Wind	Specific project locations
Geothermal	Specific project locations
EGS	Specific project locations
Pumped Hydro	Specific project locations
Li-ion Battery	
Gas CT	Excluded from CA, WA, OR
Hydrogen	Not available until 2045
CCS	Excluded from CA, WA, OR
Nuclear SMR	Excluded from CA and OR

Fuel Price Forecast

Summer Gas Price (Nominal $/MMBtu)



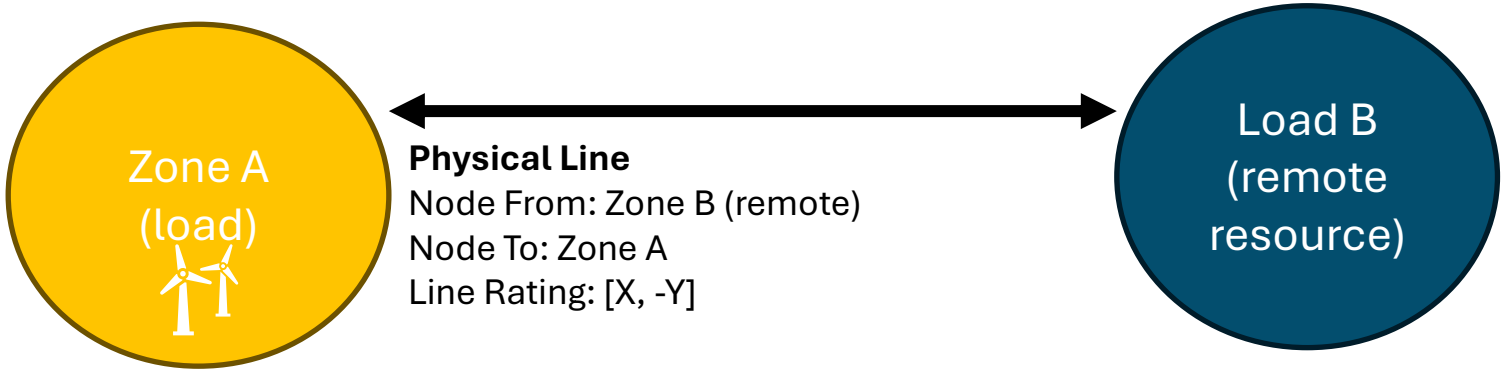
Winter Gas Price (Nominal $/MMBtu)



+ **Core gas prices derived using a combination of forwards in the near-term and AEO fundamentals-based forecasts for the longer term**
  - Monthly SNL forwards for Henry Hub used through 2028
  - Past 2028, Henry Hub forecast is trended to EIA forecasts by 2040
+ **For all other hubs, monthly basis differentials are derived from SNL forwards in the near term**
  - 3 years of monthly basis derived from forwards are averaged and assumed to hold constant through the forecast

Out-of-state/remote resource modeling

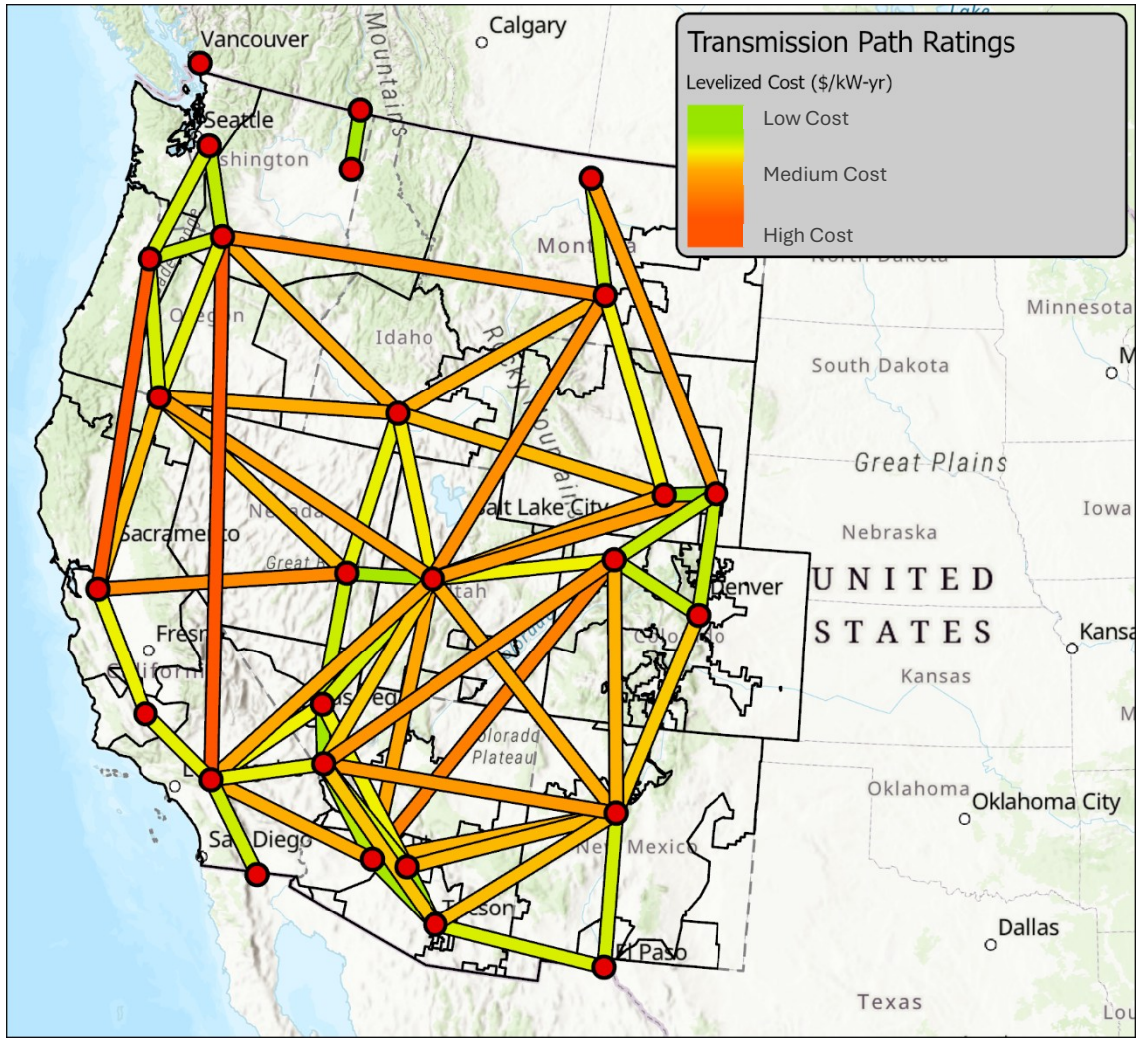
- **Out-of-state resources are placed in the load zone they are contracted to serve, rather than their physical remote zone, in the model. However, the transmission capacity required for the resource to flow from the remote zone to the load zone (which reduces headroom on the transmission line for other flows) is accounted for using the following constraint:**



- **Subtract remote wind generator's generation from the line rating**
  - Physical Line Flow Coefficient * 1 + remote wind Generator Generation Coefficient * 1 <= X
  - This should not be applied to candidate remote gen that comes with dedicated new Tx
  - Can be applied to multiple lines in a selected path between the load zone and the remote resource zone

Transmission Expansion Costs Methodology

1. Identify a major high-voltage substation within each PLEXOS region to represent each region as a single node (presented previously)
2. Calculate the straight-line path between each region's representative node
3. Calculate routing distance multipliers that consider both greenfield and existing ROW alternative paths[1]
4. Using single-circuit compensated 500-kV per unit costs and transfer capabilities from MISO 2024 MTEP [2] with the line distance, adjusted by routing multipliers (from 3), for overnight project costs in $/MW
5. Using the cost levelization parameters from the CPUC Draft I&A,[3] to then calculate the LFC (2024 $/kW-yr) for each line using the overnight projects costs (from 4) and additional regional cost adjustments

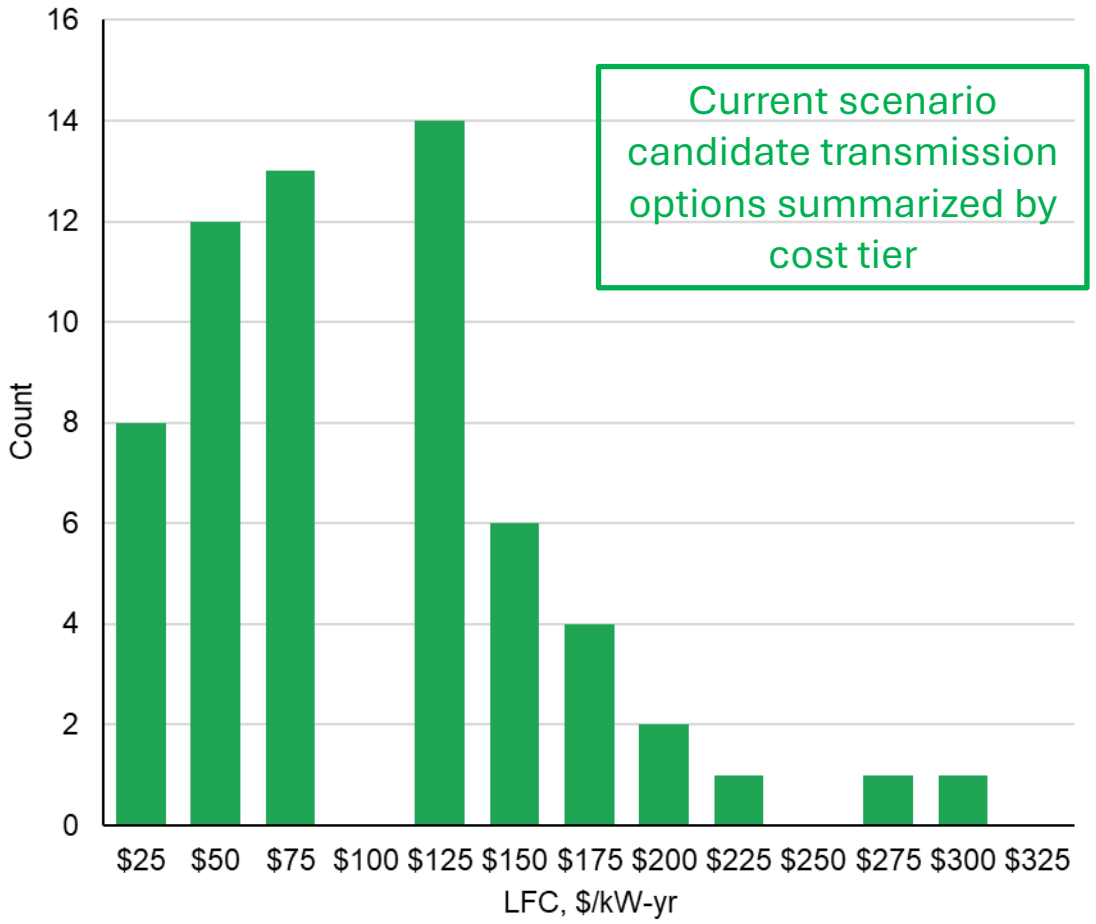


[1] https://www.pnas.org/doi/10.1073/pnas.2204098120
[2] https://www.energy.gov/gdo/national-transmission-needs-study
[3] https://www.caiso.com/documents/2024-20-year-transmission-outlook-jul-31-2024.pdf

Transmission Cost Benchmarking

+ ***The generic transmission expansion costs we calculated were consistently in alignment with costs shown for certain in-development reference projects including:***
  - *SWIP North*
  - *New ONLine*
  - *Transwest*
  - *SunZia*

Histogram of Candidate Transmission Costs



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Resource Expansion Results

Total Resource Capacity and Generation Summaries

2045 Total Resource Capacity

WECC - US	Solar	Customer Solar	Wind	Offshore Wind	Battery Storage	Geothermal	Hydro	Hydrogen	Nuclear	Pumped Hydro	Gas CCS	Gas	Oil	Coal	Other	Total
Baseline Capacity *(10-yr Reference Portfolio)*	103,411	56,943	74,104	3,855	67,243	6,255	52,250	-	5,433	6,860	-	70,415	1,726	4,111	260	452,867
2035 Selected Candidate Resource Capacity *(Incremental to Baseline)*	383		16,432									2,925				19,740
2045 Selected Candidate Resource Capacity *(Incremental to Baseline and 2035 Selected)*	86,731		36,969	676	22,693			7,654		50		9,022				163,795
2045 Total Capacity	**190,525**	**56,943**	**127,505**	**4,531**	**89,936**	**6,255**	**52,250**	**7,654**	**5,433**	**6,910**	**-**	**82,362**	**1,726**	**4,111**	**260**	**636,401**

For simplicity, "Baseline Capacity" above includes the existing/planned resources remaining online in 2045 in the 10-yr Reference Portfolio. While the model does not optimize for economic retirement, it accounts for planned retirements of some baseline resources from 2035 to 2045, which can be found by comparing the next two slides.

2035 Total Resource Capacity (MW) (10-yr Reference Portfolio + Selected Candidate Resources)

+ ***Note***
  - *Generators built for a remote load center are included in the origination zone. E.g. NM wind for CA shows up in PNM.*
  - *There are 5 regional capacity/PRM zones – CA, PNW Core, Rest of PNW, DSW, and Rockies. Resources built in any of the regions within the same capacity zone can contribute equally to meeting that region's PRM.*
+ ***Total builds in 2035 largely reflect portfolios identified in the 10-Year Reference Scenario with some additional wind resources added primarily based on economics***
  - *Model runs intertemporally so 2035 builds include consideration & anticipation of 2045 needs and value*

	Solar	Customer Solar	Wind	Offshore Wind	Battery Storage	Geothermal	Hydro	Hydrogen	Nuclear	Pumped Hydro	Gas CCS	Gas	Oil	Coal	Other	Total
CA																
WECC_CA-NP15+	7,113	11,228	4,710	931	7,113	1,275	8,699	-	-	2,047	-	12,658	335	-	694	56,803
WECC_CA-SP15+	34,252	16,909	13,805	-	30,391	3,483	1,585	-	-	2,302	-	18,216	59	25	762	121,788
WECC_CA_PGandE_ZP26	5,778	4,728	411	2,924	1,974	-	28	-	-	-	-	3,209	-	-	44	19,097
PNW NW																
BPA-NW	-	-	6	-	4	-	238	-	-	-	-	850	-	-	230	1,329
PNW Core_NW	-	-	0	-	-	-	677	-	-	-	-	1,586	-	-	-	2,264
PugetSound	16	1,059	1,423	-	1,992	-	368	-	-	400	-	1,493	3	-	35	6,788
SeattleCL	-	73	-	-	-	-	844	-	-	-	-	3	12	-	5	937
TacomaPower	-	27	-	-	-	-	697	-	-	-	-	-	-	-	-	724
PNW NE																
Avista	19	46	609	-	1	-	1,252	-	-	-	-	753	3	-	131	2,814
BPA-NE	828	-	5,530	-	1,215	-	20,165	-	1,151	314	-	615	-	-	27	29,844
ChelanCountyPUD	-	1	-	-	-	-	1,984	-	-	-	-	-	-	-	-	1,985
DouglasCountyPUD	-	2	-	-	-	-	840	-	-	-	-	-	-	-	-	842
GrantCountyPUD	280	3	144	-	-	-	2,192	-	-	-	-	-	-	-	-	2,619
PACW-NE	1,246	942	4,026	-	940	-	2	-	-	-	-	464	-	-	-	7,620
PNW Core_NE	1,890	-	10,237	-	-	-	1,104	-	-	-	-	924	-	-	-	14,155
PNW SW																
BPA-SW	-	-	-	-	-	-	1,913	-	-	-	-	235	-	-	121	2,268
PACW-SW	3	-	-	-	-	-	269	-	-	-	-	-	-	-	163	435
PNW Core_SW	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
PortlandGeneral	81	145	334	-	645	-	241	-	-	-	-	-	-	-	19	1,464
PNW SE																
BPA-SE	679	15	-	-	-	38	2	-	-	-	-	-	-	-	-	735
PACW-SE	565	-	21	-	-	-	15	-	-	-	-	-	-	-	-	601
PNW Core_SE	1,811	-	2,516	-	-	-	482	-	-	-	-	590	-	-	-	5,399
Rest of PNW																
IdahoPower	2,397	154	3,399	-	1,055	36	2,344	-	-	-	-	723	5	-	35	10,149
NWMT	418	171	3,253	-	100	-	751	-	-	-	-	186	-	1,587	132	6,598
PacificorpEast	5,118	2,077	2,631	-	844	484	281	-	-	-	-	3,811	28	2,730	109	18,112
PacificorpEastWY	92	133	11,581	-	660	-	4	-	345	-	-	2,762	1	1,711	112	17,401
MISO																
North Dakota Wind (forced-in)			3,000													3,000
DSW																
NevadaNorth	6,192	151	150	-	2,380	903	1	-	-	-	-	1,530	-	219	3	11,529
NevadaSouth	3,982	1,667	-	-	2,473	4	1,039	-	-	-	-	4,981	-	-	13	14,160
AZPublicService	8,103	3,765	2,902	-	3,819	-	-	-	3,937	-	-	6,469	1,086	-	25	30,106
ElPasoElectric	1,888	162	159	-	1,141	-	-	-	-	-	-	1,091	2	-	54	4,497
PublicServiceNM	4,350	527	7,959	-	2,856	29	62	-	-	-	-	1,680	31	-	2	17,496
SaltRiverProject	11,837	1,270	880	-	4,635	-	80	-	-	1,176	-	9,003	2	-	-	28,883
TucsonElectric	2,408	478	1,003	-	1,956	-	-	-	-	40	-	1,316	-	415	3	7,619
WAPA_LwrCO	3,682	144	680	-	275	-	2,746	-	-	-	-	1,552	-	-	-	9,078
Rockies																
PublicServiceCO	4,757	2,765	9,992	-	2,707	5	33	-	-	342	-	5,992	51	-	32	26,676
WAPA_ColMo	1,680	164	748	-	609	-	1,368	-	-	239	-	886	100	-	6	5,800
WAPA_ColMo_WY	-	-	3,113	-	0	-	-	-	-	-	-	2,008	10	1,822	1	6,954
WAPA_UprMO	-	12	110	-	0	-	226	-	-	-	-	7	5	-	2	361
Total	**111,466**	**48,818**	**95,332**	**3,855**	**69,783**	**6,255**	**52,533**	**-**	**5,433**	**6,860**	**-**	**85,595**	**1,732**	**8,509**	**2,757**	**498,928**

Preliminary results. Subject to change.

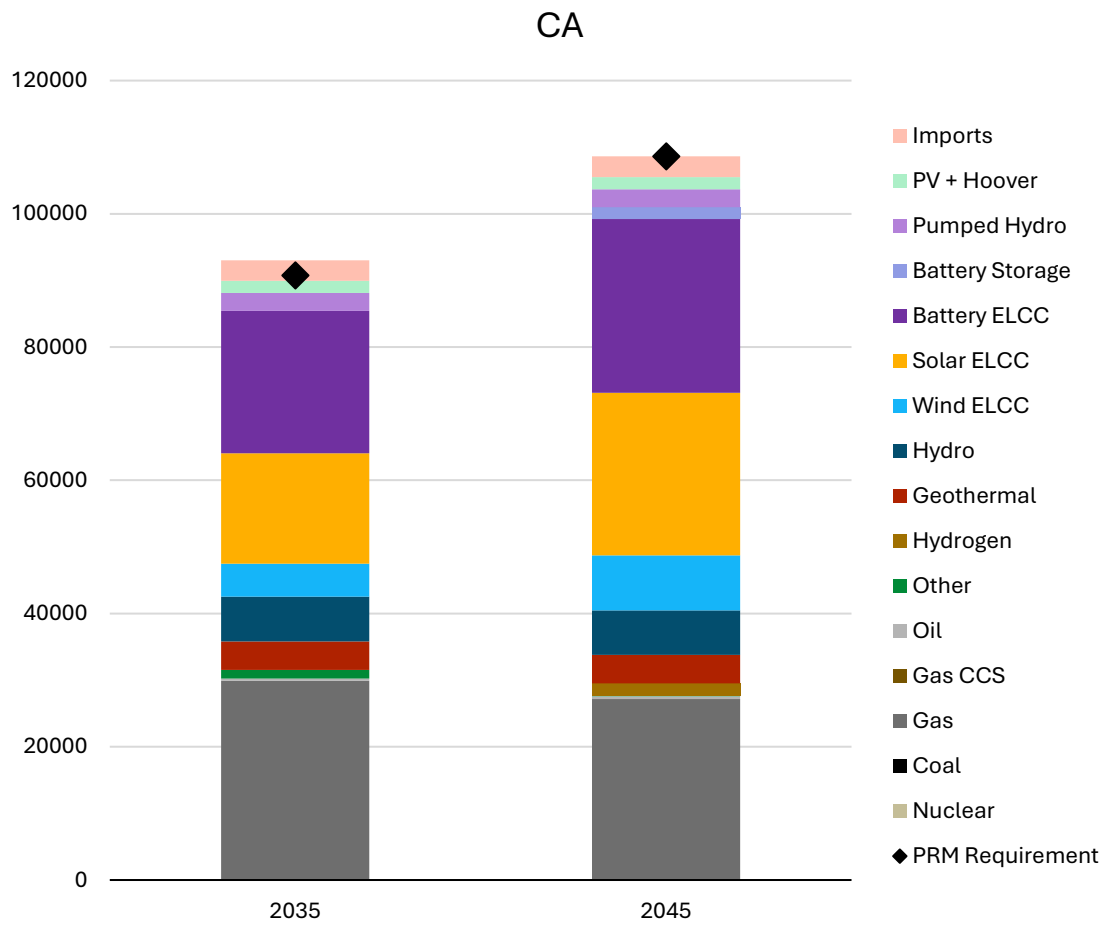
2045 Total Resource Capacity (MW) (10-yr Reference Portfolio + Selected Candidate Resources)

+ ***Note***
  - *Generators built for a remote load center are included in the origination zone. E.g. NM wind for CA shows up in PNM.*
  - *There are 5 regional capacity/PRM zones – CA, PNW Core, Rest of PNW, DSW, and Rockies. Resources built in any of the regions within the same capacity zone can contribute equally to meeting that region's PRM.*
+ ***Total builds in 2045 represent significant resource additions relative to 2035, with a diverse set of generation and capacity resources***

	Solar	Customer Solar	Wind	Offshore Wind	Battery Storage	Geothermal	Hydro	Hydrogen	Nuclear	Pumped Hydro	Gas CCS	Gas	Oil	Coal	Other	Total
CA																
WECC_CA-NP15+	24,555	12,809	7,813	1,607	12,111	1,275	8,699	2,182	-	2,047	-	11,561	335	-	3	84,996
WECC_CA-SP15+	41,119	19,766	15,385	-	36,055	3,483	1,585	0	-	2,352	-	16,757	57	25	97	136,681
WECC_CA_PGandE_ZP26	17,606	5,601	1,885	2,924	3,633	-	28	0	-	-	-	2,664	-	-	-	34,341
PNW NW																
BPA-NW	-	-	6	-	4	-	238	-	-	-	-	850	-	-	2	1,100
PNW Core_NW	-	-	0	-	-	-	512	0	-	-	-	1,109	-	-	-	1,621
PugetSound	16	1,270	1,423	-	1,792	-	368	-	-	400	-	1,214	3	-	-	6,485
SeattleCL	-	82	-	-	-	-	844	-	-	-	-	3	12	-	-	941
TacomaPower	-	28	-	-	-	-	697	-	-	-	-	-	-	-	-	725
PNW NE																
Avista	19	49	609	-	1	-	1,252	-	-	-	-	576	3	-	-	2,510
BPA-NE	818	-	5,530	-	1,215	-	20,125	-	1,151	314	-	615	-	-	2	29,768
ChelanCountyPUD	-	1	-	-	-	-	1,984	-	-	-	-	-	-	-	-	1,985
DouglasCountyPUD	-	3	-	-	-	-	840	-	-	-	-	-	-	-	-	843
GrantCountyPUD	280	4	144	-	-	-	2,192	-	-	-	-	-	-	-	-	2,620
PACW-NE	946	1,130	3,976	-	940	-	1	-	-	-	-	464	-	-	-	7,458
PNW Core_NE	15,920	-	16,954	-	-	-	1,104	0	-	-	-	924	-	-	-	34,902
PNW SW																
BPA-SW	-	-	-	-	-	-	1,909	-	-	-	-	235	-	-	-	2,144
PACW-SW	3	-	-	-	-	-	203	-	-	-	-	-	-	-	-	206
PNW Core_SW	1,005	-	-	-	-	-	-	5,472	-	-	-	-	-	-	-	6,477
PortlandGeneral	81	174	334	-	645	-	241	-	-	-	-	-	-	-	1	1,476
PNW SE																
BPA-SE	679	16	-	-	-	38	2	-	-	-	-	-	-	-	-	736
PACW-SE	565	-	21	-	-	-	12	-	-	-	-	-	-	-	-	597
PNW Core_SE	10,247	-	2,516	-	-	-	482	0	-	-	-	100	-	-	-	13,345
Rest of PNW																
IdahoPower	2,397	169	7,031	-	1,055	36	2,344	-	-	-	-	723	5	-	-	13,761
NWMT	418	198	4,702	-	100	-	751	-	-	-	-	186	-	1,587	38	7,981
PacificorpEast	9,431	2,337	2,714	-	844	484	279	-	-	-	-	4,429	28	458	2	21,005
PacificorpEastWY	92	143	12,408	-	660	-	3	-	345	-	-	5,043	1	-	112	18,807
MISO																
North Dakota Wind (forced-in)			3,000													3,000
DSW																
NevadaNorth	5,912	170	150	-	2,615	903	1	-	-	-	-	737	-	219	-	10,706
NevadaSouth	2,882	1,924	1,485	-	2,193	4	1,039	-	-	-	-	2,611	-	-	-	12,138
AZPublicService	8,103	4,568	4,044	-	4,702	-	-	-	3,937	-	-	5,073	1,086	-	-	31,512
ElPasoElectric	5,086	196	1,433	-	3,445	-	-	-	-	-	-	1,138	2	-	4	11,305
PublicServiceNM	4,797	652	9,631	-	2,386	29	62	-	-	-	-	4,501	31	-	-	22,088
SaltRiverProject	10,697	1,474	880	-	3,658	-	80	-	-	1,176	-	8,995	2	-	-	26,961
TucsonElectric	11,599	564	873	-	7,580	-	-	-	-	40	-	1,155	-	-	-	21,811
WAPA_LwrCO	3,622	187	680	-	662	-	2,746	-	-	-	-	1,552	-	-	-	9,448
Rockies																
PublicServiceCO	8,052	3,225	11,602	-	3,031	5	33	-	-	342	-	5,043	48	-	-	31,382
WAPA_ColMo	3,580	187	4,697	-	609	-	1,368	-	-	239	-	886	100	-	-	11,665
WAPA_ColMo_WY	0	-	5,468	-	0	-	-	-	-	-	-	3,212	10	1,822	-	10,512
WAPA_UprMO	-	16	110	-	0	-	226	-	-	-	-	7	5	-	-	363
Total	**190,525**	**56,943**	**127,505**	**4,531**	**89,936**	**6,255**	**52,250**	**7,654**	**5,433**	**6,910**	**-**	**82,362**	**1,726**	**4,111**	**260**	**636,401**

Preliminary results. Subject to change.

PRM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2045
Imports
PV + Hoover
Pumped Hydro
Battery Storage
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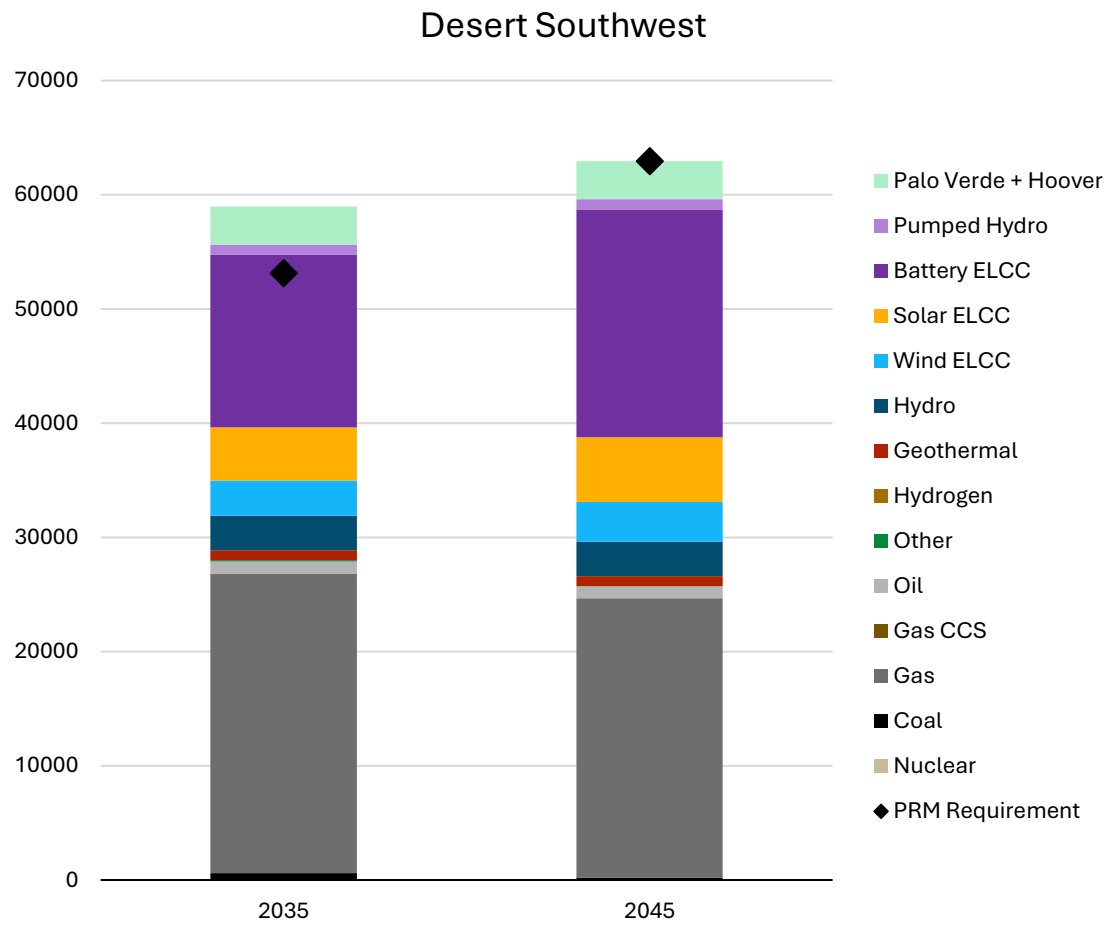
Wind ELCC
Hydro
Geothermal
Hydrogen
Other
Oil
Gas CCS
Gas
Coal
Nuclear
PRM Requirement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Palo Verde + Hoover
Pumped Hydro
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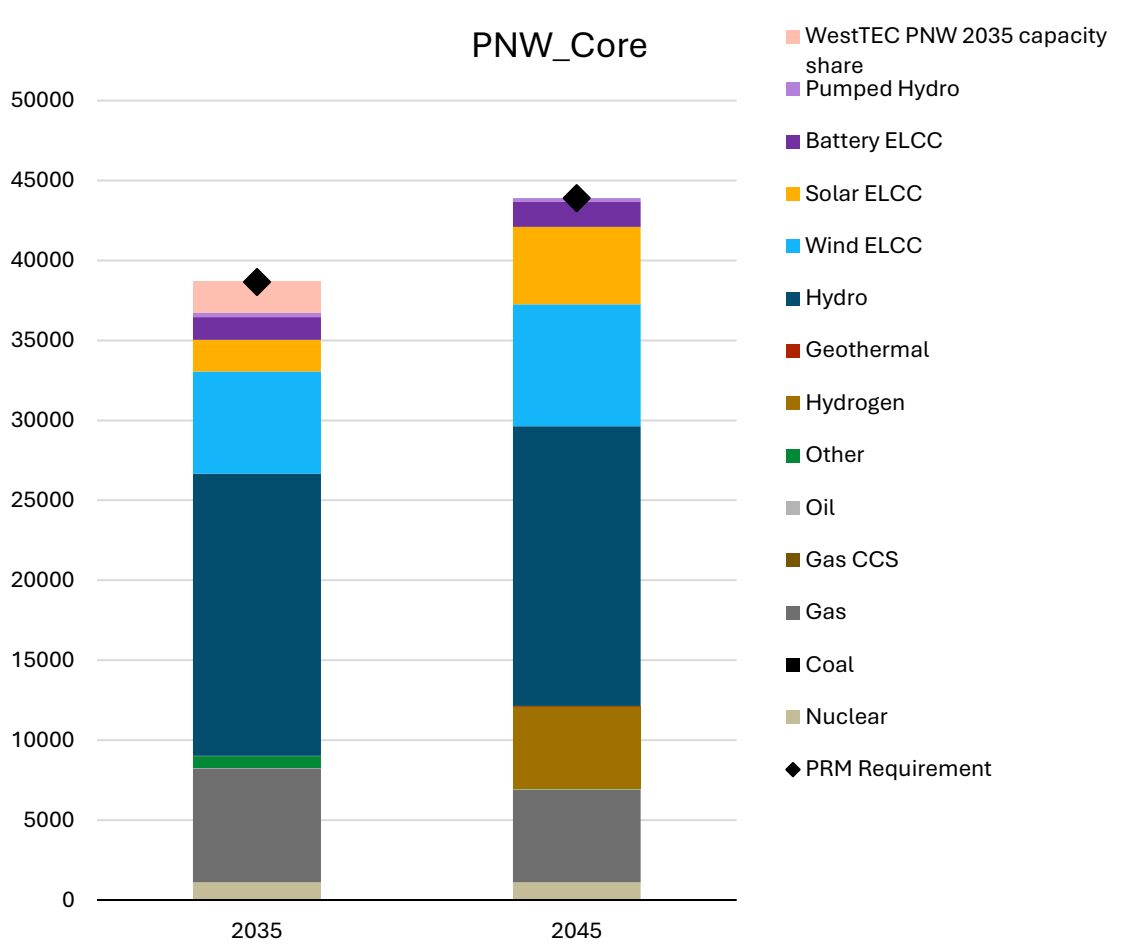
Hydrogen
Other
Oil
Gas CCS
Gas
Coal
Nuclear
PRM Requirement

PRM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2035
2045
WestTEC PNW 2035 capacity share
Pumped Hydro
Battery ELCC
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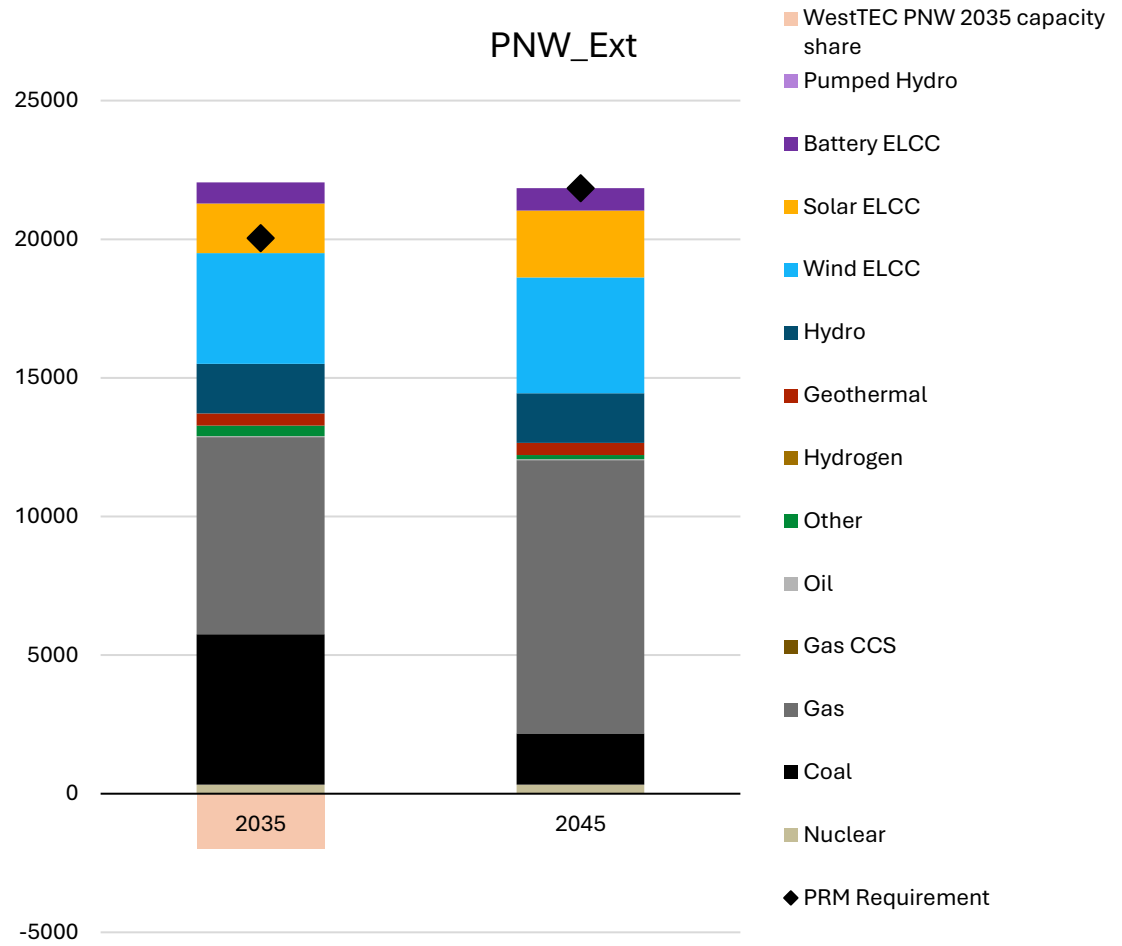
Geothermal
Hydrogen
Other
Oil
Gas CCS
Gas
Coal
Nuclear
PRM Requirement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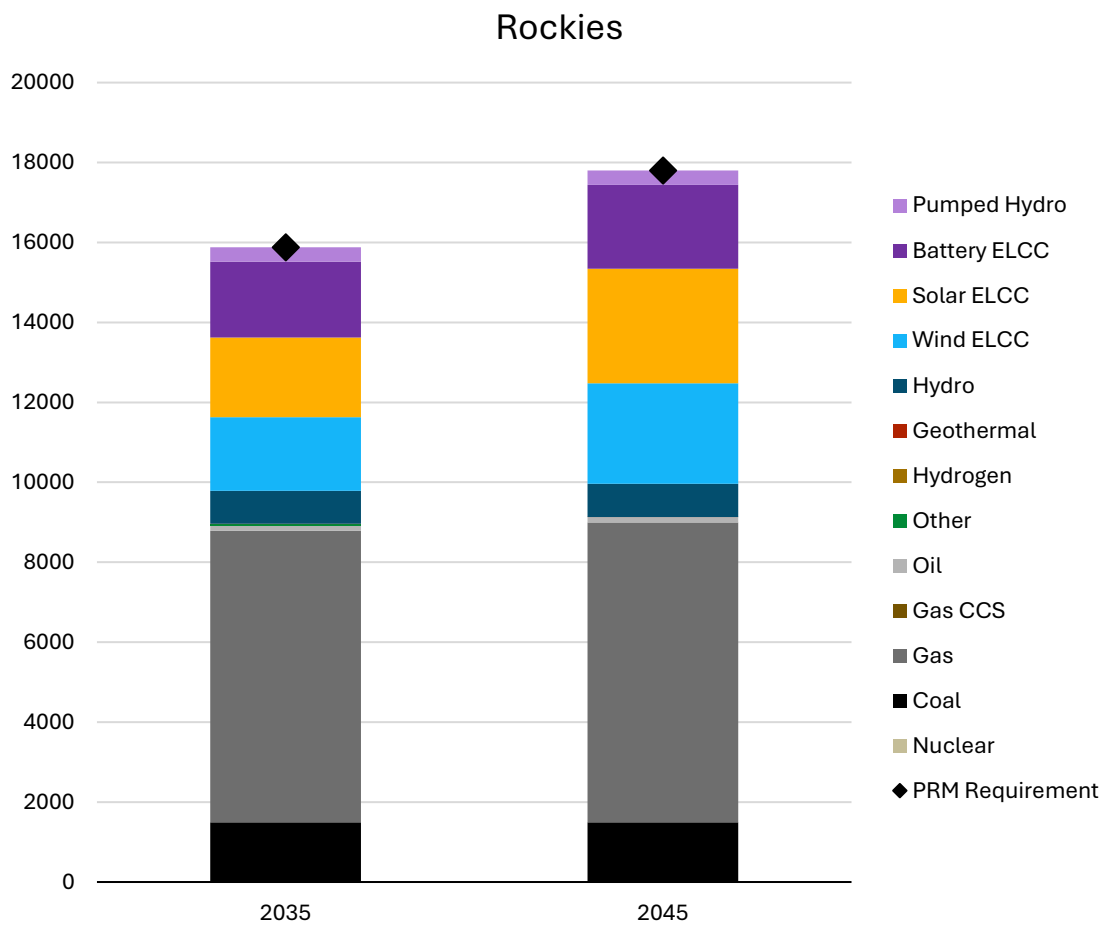
Gas CCS
Gas
Coal
Nuclear
PRM Requirement

PRM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4000
2000
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2035
2045
Pumped Hydro
Battery ELCC
Solar ELCC
Wind ELCC
Hydro
Geothermal
Hydrogen
Other
Oil
Gas CCS
Gas
Coal
Nuclear
PRM Requirement

2035 Total Resource Generation (GWh)
(10-yr Reference Portfolio + Selected Candidate Resources)

+ ***Note***
  - *For this energy generation summary, the generators built for a remote load center are included in the load delivery zone. E.g. NM wind for CA shows up in CA.*

+ ***The significant portion of generation is from renewable resources***
  - *Fossil generation accounts for about 15% of total generation*

	Solar	Customer Solar	Wind	Offshore Wind	Battery Storage	Hydro	Geothermal	Hydrogen	Nuclear	Pumped Hydro	Gas CCS	Gas	Coal	Oil	Other	Total
CA																
WECC_CA-NP15+	19,265	20,681	13,986	1,739	(1,232)	20,957	6,124	-	-	(760)	-	19,266	-	-	4,957	104,982
WECC_CA-SP15+	87,782	31,144	48,078	-	(8,265)	4,188	26,210	-	-	(1,351)	-	8,005	66	-	4,842	200,699
WECC_CA_PGandE_ZP26	13,957	8,708	1,159	11,482	(539)	74	-	-	-	-	-	4,468	-	-	302	39,612
PNW NW																
BPA-NW	-	-	18	-	(0)	874	-	-	-	-	-	1,596	-	-	1,626	4,114
PNW Core_NW	0	-	2,144	-	(0)	1,949	-	-	-	-	-	2,681	-	-	-	6,774
PugetSound	28	1,610	5,443	-	(47)	1,133	-	-	-	(12)	-	3,176	-	-	236	11,566
SeattleCL	-	111	-	-	-	2,663	-	-	-	-	-	6	-	-	34	2,814
TacomaPower	-	41	-	-	-	2,368	-	-	-	-	-	-	-	-	-	2,409
PNW NE																
Avista	38	70	2,038	-	(0)	4,476	-	-	-	-	-	1,116	-	-	889	8,626
BPA-NE	1,683	-	15,541	-	(191)	73,922	-	-	8,282	(186)	-	570	-	-	189	99,809
ChelanCountyPUD	-	2	-	-	-	9,856	-	-	-	-	-	-	-	-	-	9,857
DouglasCountyPUD	-	3	-	-	-	4,451	-	-	-	-	-	-	-	-	-	4,454
GrantCountyPUD	502	5	392	-	-	10,284	-	-	-	-	-	-	-	-	-	11,183
PACW-NE	2,752	1,432	9,073	-	(138)	6	-	-	-	-	-	1,704	-	-	-	14,829
PNW Core_NE	3,265	-	30,787	-	(0)	3,482	-	-	-	-	-	1,062	-	-	-	38,597
PNW SW																
BPA-SW	-	-	-	-	-	7,012	-	-	-	-	-	22	-	-	893	7,927
PACW-SW	5	-	-	-	-	773	-	-	-	-	-	-	-	-	1,217	1,995
PNW Core_SW	0	-	-	-	(0)	-	-	-	-	-	-	-	-	-	-	0
PortlandGeneral	150	220	1,161	-	(22)	668	-	-	-	-	-	-	-	-	109	2,286
PNW SE																
BPA-SE	1,556	25	-	-	-	7	288	-	-	-	-	-	-	-	-	1,875
PACW-SE	1,395	-	45	-	-	44	-	-	-	-	-	-	-	-	-	1,484
PNW Core_SE	3,738	-	7,455	-	(0)	1,339	-	-	-	-	-	1,454	-	-	-	13,986
Rest of PNW																
IdahoPower	4,180	253	10,347	-	(337)	9,495	271	-	-	-	-	542	-	-	212	24,964
NWMT	623	261	6,821	-	(45)	4,364	-	-	-	-	-	133	244	-	650	13,052
PacificorpEast	11,790	3,822	8,106	-	(241)	1,050	3,640	-	-	-	-	6,930	2,805	-	760	38,662
PacificorpEastWY	108	219	37,986	-	(362)	3	-	-	2,186	-	-	24	82	-	354	40,600
MISO																
North Dakota Wind (forced-in)			10,776													10,776
DSW																
NevadaNorth	16,407	279	370	-	(705)	3	6,793	-	-	-	-	1,665	414	-	21	25,245
NevadaSouth	11,888	2,760	0	-	(899)	1,766	26	-	-	-	-	10,174	-	-	91	25,807
AZPublicService	15,740	7,436	7,898	-	(1,198)	-	-	-	27,127	-	-	1,388	-	-	165	58,556
ElPasoElectric	5,624	316	617	-	(300)	-	-	-	-	-	-	2,335	-	6	403	9,000
PublicServiceNM	8,977	1,028	31,375	-	(974)	102	220	-	-	-	-	2,985	-	-	10	43,723
SaltRiverProject	32,087	2,508	3,662	-	(1,347)	113	-	-	-	(659)	-	6,276	-	-	-	42,641
TucsonElectric	7,029	944	2,785	-	(504)	-	-	-	-	(30)	-	15	537	-	17	10,794
WAPA_LwrCO	7,502	241	1,768	-	(85)	7,330	-	-	-	-	-	529	-	-	-	17,284
Rockies																
PublicServiceCO	11,407	4,629	34,092	-	(675)	110	34	-	-	(199)	-	11,225	-	-	251	60,875
WAPA_ColMo	4,057	275	3,239	-	(161)	4,048	-	-	-	(160)	-	1,270	-	-	41	12,608
WAPA_ColMo_WY	0	-	4,114	-	(0)	-	-	-	-	-	-	150	573	-	6	4,844
WAPA_UprMO	-	18	335	-	(0)	619	-	-	-	-	-	0	-	-	11	983
Total	**273,535**	**89,041**	**301,611**	**13,221**	**(18,269)**	**179,528**	**43,606**	**-**	**37,594**	**(3,356)**	**-**	**90,769**	**4,721**	**6**	**18,288**	**1,030,295**

2045 Total Resource Generation (GWh)
(10-yr Reference Portfolio + Selected Candidate Resources)

+ ***Note***
  - *For this energy generation summary, the generators built for a remote load center are included in the load delivery zone. E.g. NM wind for CA shows up in CA.*

+ ***Even more of the total generation is from renewable resources***
  - *Fossil generation now accounts for less than 10% of the total generation*

	Solar	Customer Solar	Wind	Offshore Wind	Battery Storage	Hydro	Geothermal	Hydrogen	Nuclear	Pumped Hydro	Gas CCS	Gas	Coal	Oil	Other	Total
CA																
WECC_CA-NP15+	68,258	23,593	26,828	5,029	(3,786)	20,904	5,766	417	-	(1,233)	-	7,008	-	-	4	152,786
WECC_CA-SP15+	109,050	36,407	77,001	-	(10,347)	4,257	26,287	0	-	(1,539)	-	4,450	0	-	357	245,922
WECC_CA_PGandE_ZP26	20,380	10,316	5,128	9,249	(1,216)	74	-	0	-	-	-	1,058	-	-	-	44,988
PNW NW																
BPA-NW	-	-	18	-	(1)	861	-	-	-	-	-	968	-	-	10	1,856
PNW Core_NW	0	-	7,352	-	(0)	1,920	-	0	-	-	-	784	-	-	-	10,056
PugetSound	29	1,930	5,359	-	(213)	1,155	-	-	-	(91)	-	812	-	-	-	8,981
SeattleCL	-	125	-	-	-	2,624	-	-	-	-	-	2	-	-	-	2,751
TacomaPower	-	43	-	-	-	2,270	-	-	-	-	-	-	-	-	-	2,313
PNW NE																
Avista	39	74	1,808	-	(0)	4,425	-	-	-	-	-	535	-	-	-	6,881
BPA-NE	1,198	-	12,354	-	(438)	72,788	-	-	7,872	(407)	-	450	-	-	2	93,819
ChelanCountyPUD	-	2	-	-	-	9,816	-	-	-	-	-	-	-	-	-	9,818
DouglasCountyPUD	-	5	-	-	-	4,434	-	-	-	-	-	-	-	-	-	4,438
GrantCountyPUD	456	6	306	-	-	10,243	-	-	-	-	-	-	-	-	-	11,011
PACW-NE	2,070	1,718	7,733	-	(271)	5	-	-	-	-	-	464	-	-	-	11,719
PNW Core_NE	31,027	-	55,343	-	(0)	3,431	-	0	-	-	-	674	-	-	-	90,475
PNW SW																
BPA-SW	-	-	-	-	-	6,904	-	-	-	-	-	9	-	-	-	6,913
PACW-SW	5	-	-	-	-	762	-	-	-	-	-	-	-	-	-	767
PNW Core_SW	2,225	-	-	-	(0)	-	-	967	-	-	-	-	-	-	-	3,192
PortlandGeneral	153	264	1,141	-	(97)	657	-	-	-	-	-	-	-	-	5	2,124
PNW SE																
BPA-SE	1,108	26	-	-	-	7	288	-	-	-	-	-	-	-	-	1,429
PACW-SE	1,411	-	45	-	-	44	-	-	-	-	-	-	-	-	-	1,500
PNW Core_SE	16,665	-	7,479	-	(0)	1,317	-	0	-	-	-	0	-	-	-	25,461
Rest of PNW																
IdahoPower	5,461	278	10,643	-	(277)	9,265	272	0	-	-	0	745	-	-	-	26,386
NWMT	904	302	7,697	-	(32)	4,350	-	-	-	-	-	111	471	-	181	13,984
PacificorpEast	21,721	4,300	7,626	-	(261)	1,034	3,651	0	-	-	0	6,828	760	-	7	45,668
PacificorpEastWY	134	235	36,660	-	(284)	3	-	-	2,219	-	0	242	-	-	355	39,565
MISO																
North Dakota Wind (forced-in)			6,109													6,109
DSW																
NevadaNorth	16,783	314	394	-	(764)	3	6,813	-	-	-	0	677	719	-	-	24,938
NevadaSouth	8,767	3,186	4,657	-	(812)	1,764	26	-	-	-	0	7,205	-	-	-	24,794
AZPublicService	18,817	9,022	10,173	-	(1,446)	-	-	-	27,133	-	-	3,252	-	-	-	66,951
ElPasoElectric	12,469	382	4,951	-	(1,120)	-	-	-	-	-	0	1,893	-	0	27	18,602
PublicServiceNM	10,633	1,272	21,931	-	(791)	102	220	-	-	-	0	2,124	-	-	-	35,491
SaltRiverProject	31,236	2,911	3,588	-	(975)	113	-	-	-	(674)	-	14,667	-	-	-	50,865
TucsonElectric	27,368	1,114	2,085	-	(2,375)	-	-	-	-	(29)	-	17	-	-	-	28,180
WAPA_LwrCO	9,567	313	1,617	-	(199)	7,279	-	-	-	-	-	2,393	-	-	-	20,970
Rockies																
PublicServiceCO	19,512	5,400	39,414	-	(941)	111	34	0	-	(272)	0	4,931	-	-	-	68,189
WAPA_ColMo	4,380	313	17,600	-	(247)	4,021	-	-	-	(207)	-	742	-	-	-	26,602
WAPA_ColMo_WY	0	-	3,895	-	(0)	-	-	0	-	-	0	152	807	-	-	4,853
WAPA_UprMO	-	24	333	-	(0)	627	-	-	-	-	0	0	-	-	-	984
Total	**441,826**	**103,875**	**387,265**	**14,278**	**(26,892)**	**177,571**	**43,358**	**1,384**	**37,224**	**(4,452)**	**0**	**63,192**	**2,757**	**0**	**947**	**1,242,332**

Incremental Selected Capacity (Beyond 10-Year Reference Portfolio)

2035 Selected Candidate Resource Capacity (MW) (Incremental to 10-yr Reference Portfolio)

+ ***The model choses to primarily add wind beyond the resources in the 10-year Reference portfolio***
  - ***Note:*** *Generators built for a remote load center are included in the origination zone. E.g. NM wind for CA shows up in PNM.*
  - *Model runs intertemporally so 2035 builds include consideration & anticipation of 2045 needs and value*
+ ***The optimization also adds some capacity resources in the PNW and in the Rockies, which are capacity short***
  - *There are 5 regional capacity/PRM zones – CA, PNW Core, Rest of PNW, DSW, and Rockies. Resources built in any of the regions within the same capacity zone can contribute to the regional PRM.*
  - *Busbar mapping and powerflow analyses will determine the final placement of gas and hydrogen capacity resources within regions*

	Solar	Wind	Offshore Wind	Battery Storage	Geothermal	Hydrogen	Nuclear	Pumped Hydro	Gas CCS	Gas	Total
CA											
WECC_CA-NP15+	-	0	-	-	-	-	-	-	-	-	0
WECC_CA-SP15+	-	(0)	-	-	-	-	-	0	-	-	(0)
WECC_CA_PGandE_ZP26	-	0	-	-	-	-	-	-	-	-	0
PNW NW											
PNW Core_NW	-	0	-	-	-	-	-	-	-	-	0
PNW NE											
PNW Core_NE	0	4,170	-	-	-	-	-	-	-	-	4,170
PNW SW											
PNW Core_SW	0	-	-	-	-	-	-	-	-	-	0
PNW SE											
PNW Core_SE	383	2,516	-	-	-	-	-	-	-	-	2,899
Rest of PNW											
IdahoPower	-	-	-	-	-	-	-	-	-	0	0
NWMT	-	617	-	-	-	-	-	-	-	-	617
PacificorpEast	-	0	-	-	-	-	-	-	-	0	0
PacificorpEastWY	-	-	-	-	-	-	-	-	-	1,335	1,335
MISO											
North Dakota Wind (forced-in)		3,000									3,000
DSW											
NevadaNorth	-	-	-	-	-	-	-	-	-	-	-
NevadaSouth	-	-	-	-	-	-	-	-	-	-	-
AZPublicService	-	-	-	-	-	-	-	-	-	-	-
ElPasoElectric	-	0	-	-	-	-	-	-	-	-	0
PublicServiceNM	-	0	-	-	-	-	-	-	-	-	0
SaltRiverProject	-	-	-	-	-	-	-	-	-	-	-
TucsonElectric	-	-	-	-	-	-	-	-	-	-	-
WAPA_LwrCO	-	-	-	-	-	-	-	-	-	-	-
Rockies											
PublicServiceCO	-	3,981	-	0	-	-	-	-	-	0	3,981
WAPA_ColMo	-	0	-	0	-	-	-	-	-	0	0
WAPA_ColMo_WY	-	2,147	-	0	-	-	-	-	-	1,590	3,737
WAPA_UprMO	-	-	-	0	-	-	-	-	-	-	0
Total	**383**	**16,432**	**-**	**0**	**-**	**-**	**-**	**0**	**-**	**2,925**	**19,740**

Preliminary results. Subject to change.

2045 Selected Candidate Resource Capacity (MW) (Incremental to 10-yr Reference Portfolio)

+ ***Solar and wind comprise the bulk of new resource additions***
  - ***Note:*** *Generators built for a remote load center are included in the origination zone. E.g. NM wind for CA shows up in PNM.*
+ ***In most regions, new gas is the primary capacity resource added to meet PRM, along with some reliance on battery storage***
  - *Hydrogen is added as new capacity in California and PNW Core likely because new gas build is not allowed for 2045*
  - *There are 5 regional capacity/PRM zones – CA, PNW Core, Rest of PNW, DSW, and Rockies. Resources built in any of the regions within the same capacity zone can contribute to the regional PRM.*
  - *Busbar mapping and powerflow analyses will determine the final placement of gas and hydrogen capacity resources within regions*

	Solar	Wind	Offshore Wind	Battery Storage	Geothermal	Hydrogen	Nuclear	Pumped Hydro	Gas CCS	Gas	Total
CA											
WECC_CA-NP15+	17,441	3,103	676	4,998	-	2,182	-	-	-	-	28,400
WECC_CA-SP15+	6,867	1,580	-	5,664	-	0	-	50	-	-	14,161
WECC_CA_PGandE_ZP26	11,828	1,474	-	1,659	-	0	-	-	-	-	14,961
PNW NW											
PNW Core_NW	-	0	-	-	-	0	-	-	-	-	0
PNW NE											
PNW Core_NE	14,030	10,888	-	-	-	0	-	-	-	-	24,918
PNW SW											
PNW Core_SW	1,005	-	-	-	-	5,472	-	-	-	-	6,477
PNW SE											
PNW Core_SE	8,829	2,516	-	-	-	0	-	-	-	-	11,345
Rest of PNW											
IdahoPower	0	3,632	-	-	-	-	-	-	-	0	3,632
NWMT	-	2,106	-	-	-	-	-	-	-	-	2,106
PacificorpEast	5,504	143	-	-	-	-	-	-	-	648	6,295
PacificorpEastWY	0	1,237	-	-	-	-	-	-	-	4,686	5,923
MISO											
North Dakota Wind (forced-in)		3,000									3,000
DSW											
NevadaNorth	-	-	-	235	-	-	-	-	-	-	235
NevadaSouth	-	1,485	-	0	-	-	-	-	-	-	1,485
AZPublicService	0	1,141	-	974	-	-	-	-	-	-	2,115
ElPasoElectric	3,978	1,274	-	2,424	-	-	-	-	-	47	7,724
PublicServiceNM	1,656	3,582	-	320	-	-	-	-	-	3,772	9,331
SaltRiverProject	0	-	-	33	-	-	-	-	-	-	33
TucsonElectric	9,592	-	-	5,674	-	-	-	-	-	-	15,266
WAPA_LwrCO	0	0	-	387	-	-	-	-	-	-	387
Rockies											
PublicServiceCO	4,255	7,280	-	324	-	-	-	-	-	0	11,859
WAPA_ColMo	2,129	3,948	-	0	-	-	-	-	-	0	6,078
WAPA_ColMo_WY	0	5,010	-	0	-	-	-	-	-	2,793	7,803
WAPA_UprMO	-	-	-	0	-	-	-	-	-	-	0
Total	**87,114**	**53,400**	**676**	**22,693**	**-**	**7,654**	**-**	**50**	**-**	**11,947**	**183,535**

Preliminary results. Subject to change.

2045 Selected Candidate Resource Capacity (Incremental to 10-yr Reference Portfolio)

- **A significant amount of remote wind is developed through 2045 for delivery to load zones mostly in CA and the PNW**
- **This is largely driven by the availability of existing and planned transmission connected to the regions with high capacity factor wind**
  - This remote wind complements the solar and storage and local wind developed in these zones

Remote Resources and their Delivery Zones

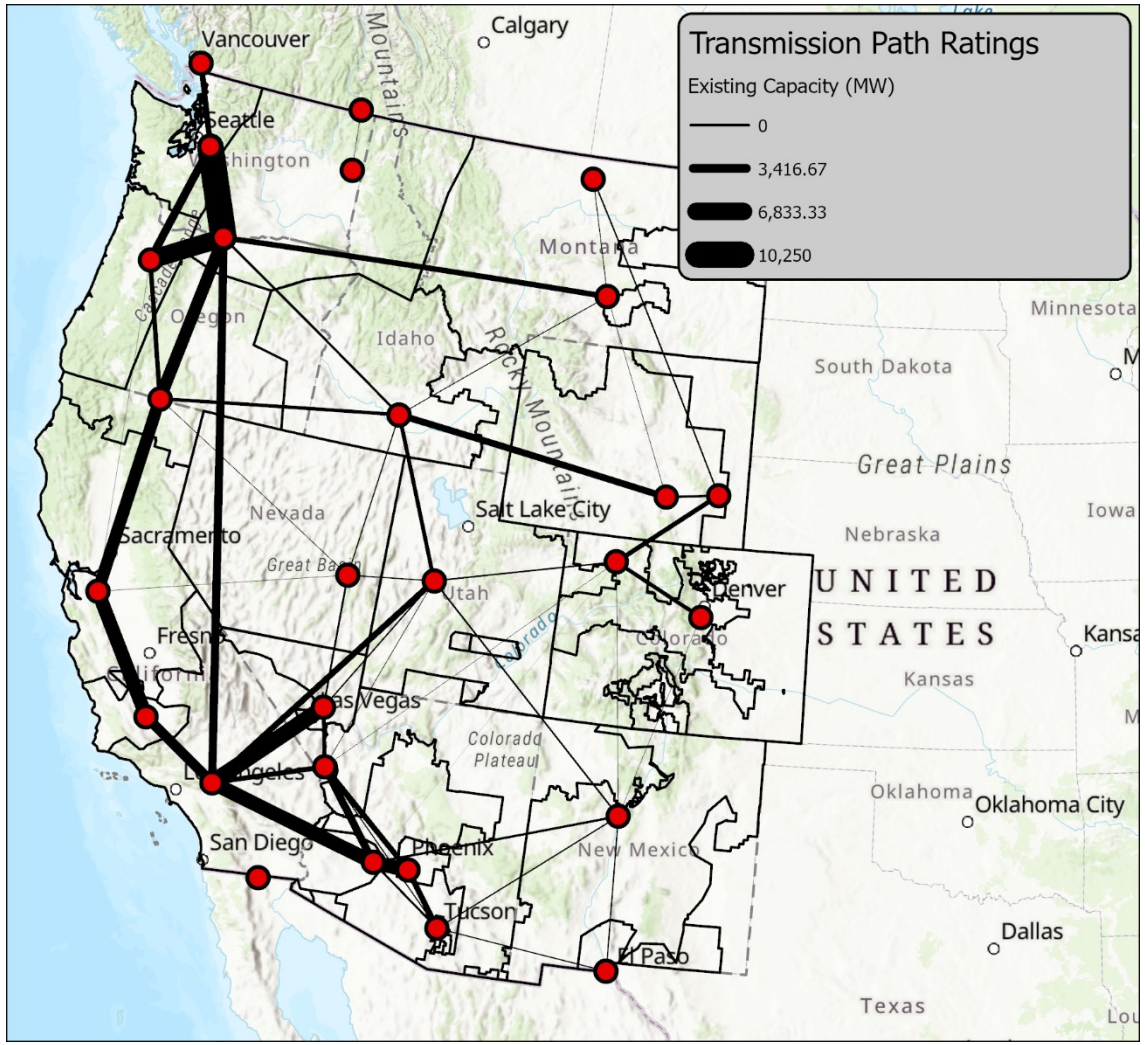
Remote Gen	Load Region	2035	2045
WY Wind	WECC_CA-NP15+	163	1,500
WY Wind	WECC_CA-SP15+	1,984	3,129
WY Wind	PNW Core_NE	-	1,094
WY Wind	NevadaSouth	-	-
WY Wind	PublicServiceCO	-	-
WY Wind	WAPA_ColMo	-	-
NM Wind	WECC_CA-SP15+	-	3,534
ID Wind	WECC_CA-SP15+	-	3,566
ID Wind	PNW Core_NE	-	209
ID Wind	PNW Core_SE	-	-
ID Wind	NevadaSouth	-	-
MT Wind	PNW Core_NW	617	2,106
AZ Solar	PNW Core_SE	-	-
NV Geo	WECC_CA-NP15+	-	-
NV Geo	WECC_CA-SP15+	-	-
UT Geo	WECC_CA-SP15+	-	-
ND Wind (forced-in)	PNW Core_NW	1,000	1,000
Total		*3,764*	*16,139*

Transmission Expansion Results

Energy+Environmental Economics

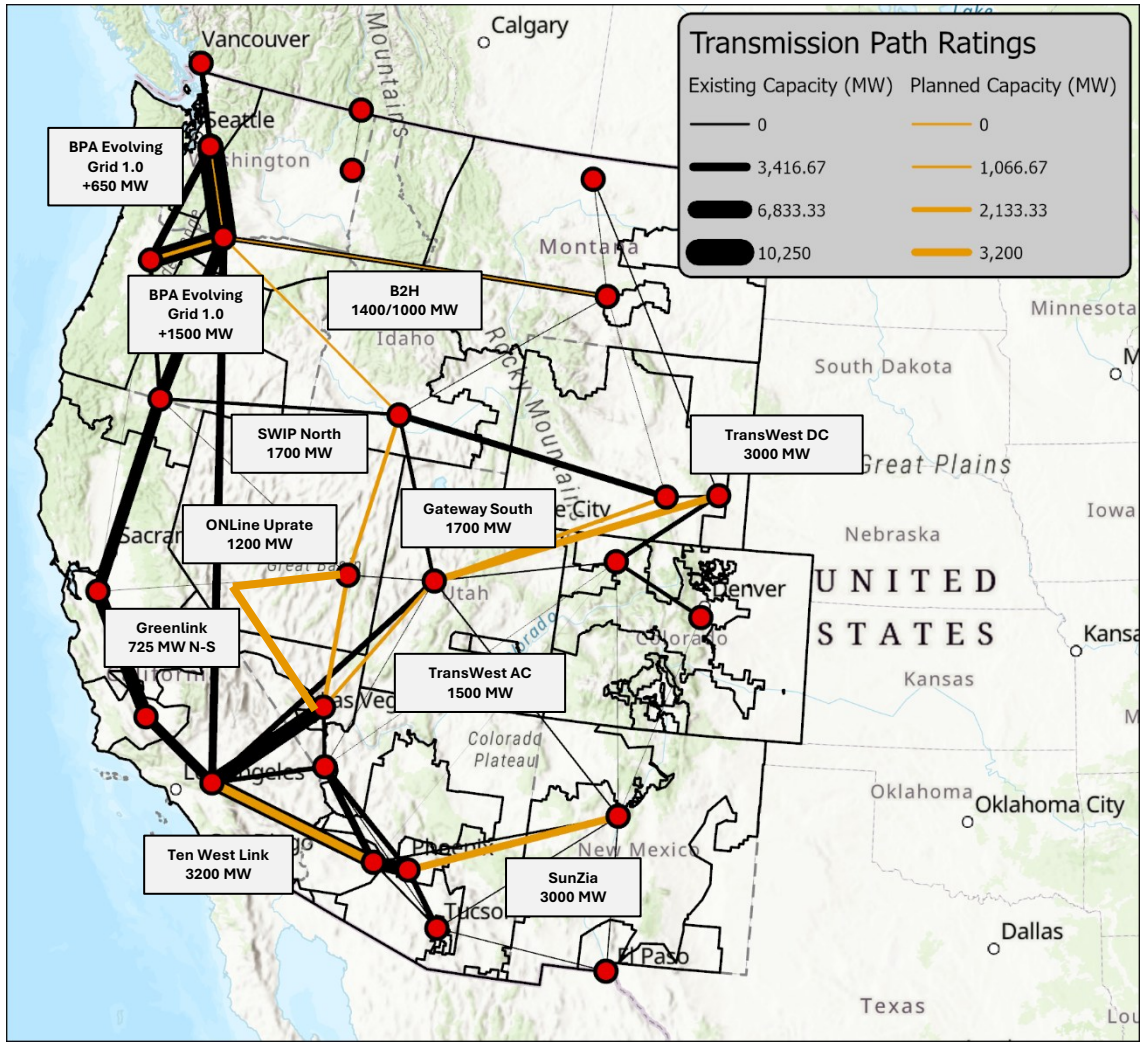
Existing Transmission Path Ratings

- The existing transmission path ratings represent present-day limits on interzonal power flow, excluding planned or in-development interregional transmission projects
- Existing transmission path ratings were primarily taken by reviewing the WECC Path Ratings
- For other interties, the maximum historical BA-BA interchange over recent historical years (2018-2024) is used to infer a path rating



Planned and In-Development Transmission Projects

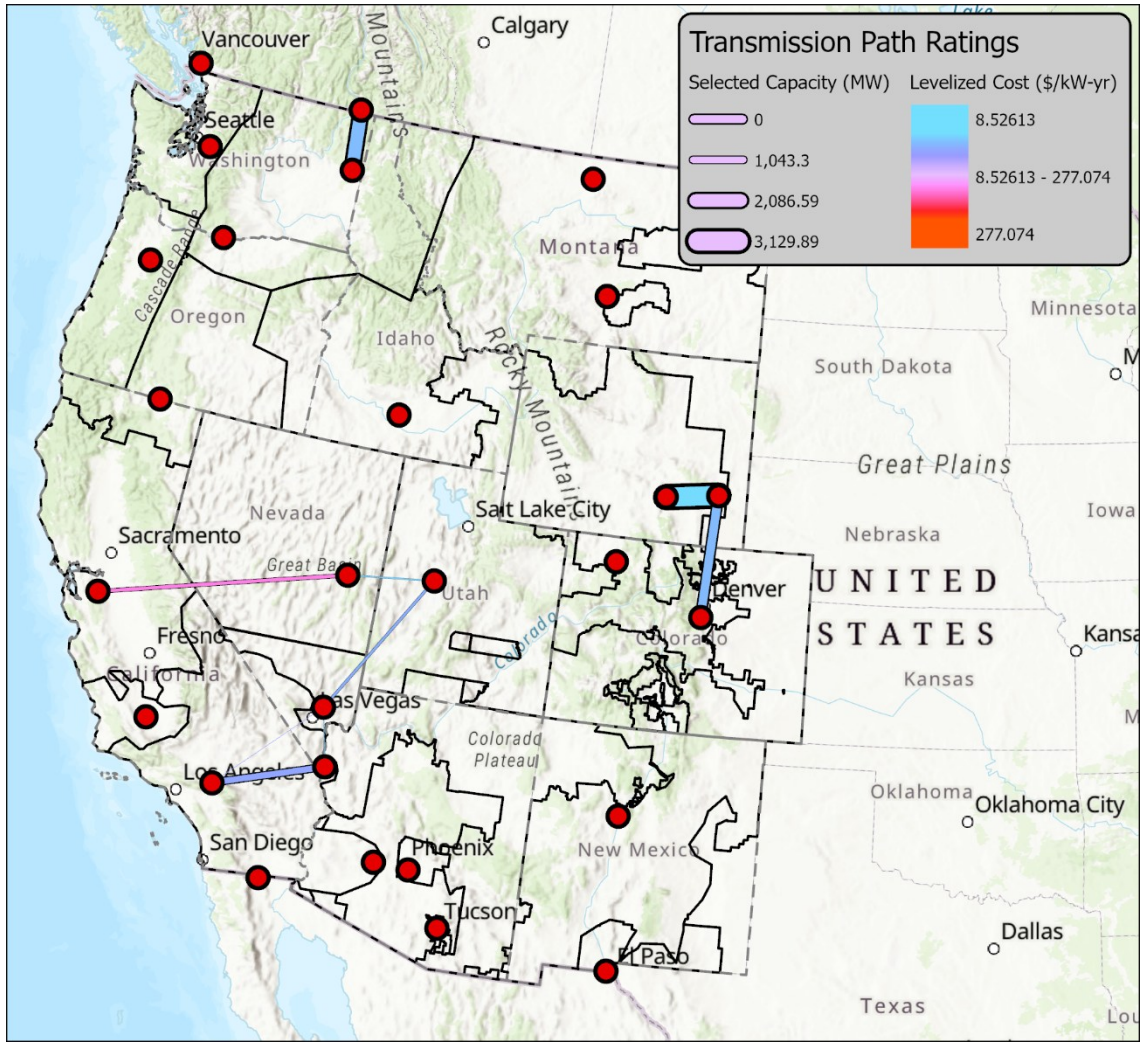
- **Major planned and in-development transmission projects are incremental to the existing transmission path ratings**
- **Major interregional transmission projects are assumed to be online by 2035 and add to the total path ratings:**
  - BPA Evolving Grid 1.0
  - B2H
  - Gateway
  - TransWest Express
  - SWIP North
  - Greenlink
  - ONLine Uprate
  - SunZia
  - Ten West Link



Selected Transmission Lines, 2045

- Due to the significant amount of existing and planned transmission, the optimization selects about 9 GW of transmission expansion/new lines
- Lines are selected primarily to deliver WY wind to loads in Colorado and Nevada/California and to deliver resources from BC Hydro to the PNW

Path	LFC ($/kW-	New Capacity (MW
BCHA_to_PNW_NE	$ 34.79	2,100
NevadaNorth_to_PacificorpEast	$ 19.12	205
NevadaNorth_to_WECC_CA_NP15	$ 183.08	555
NevadaSouth_to_WECC_CA_SP15	$ 66.88	49
NevadaSouth_to_PacificorpEast	$ 50.08	382
NevadaSouth_to_WAPA_LwrCO	$ 14.64	113
PacificorpEastWY_to_WAPA_WY	$ 11.77	3,130
PublicServiceCO_to_WAPA_WY	$ 37.54	1,400
WAPA_LwrCO_to_WECC_CA_SP15	$ 61.33	997



Preliminary results. Subject to change.

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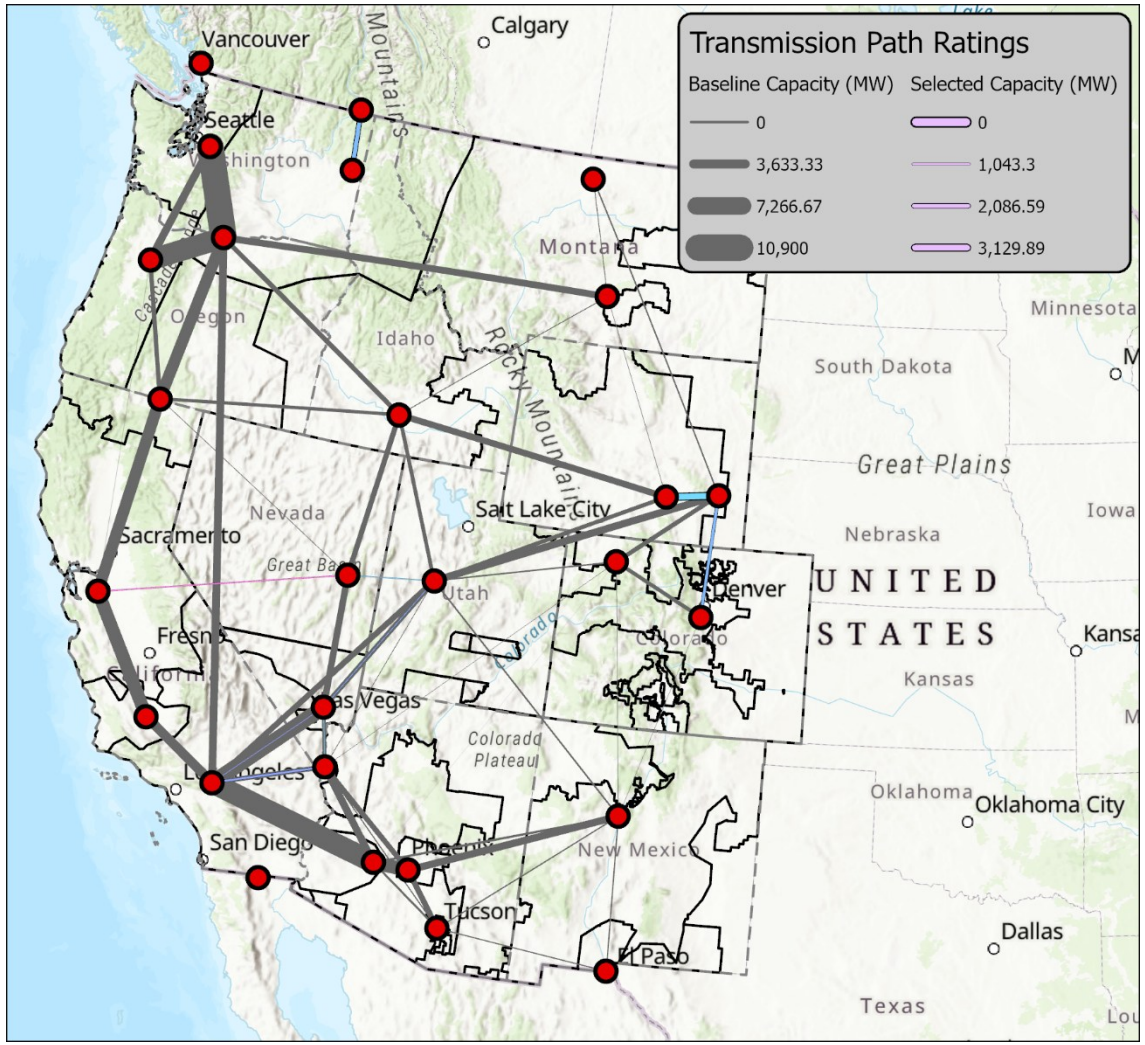


Preliminary results. Subject to change.

Energy+Environmental Economics

Thank You

If you have any questions or feedback, please feel free contact us.

Arne Olson, arne@ethree.com

Jack Moore, jack@ethree.com

Femi Sawyerr, femi@ethree.com

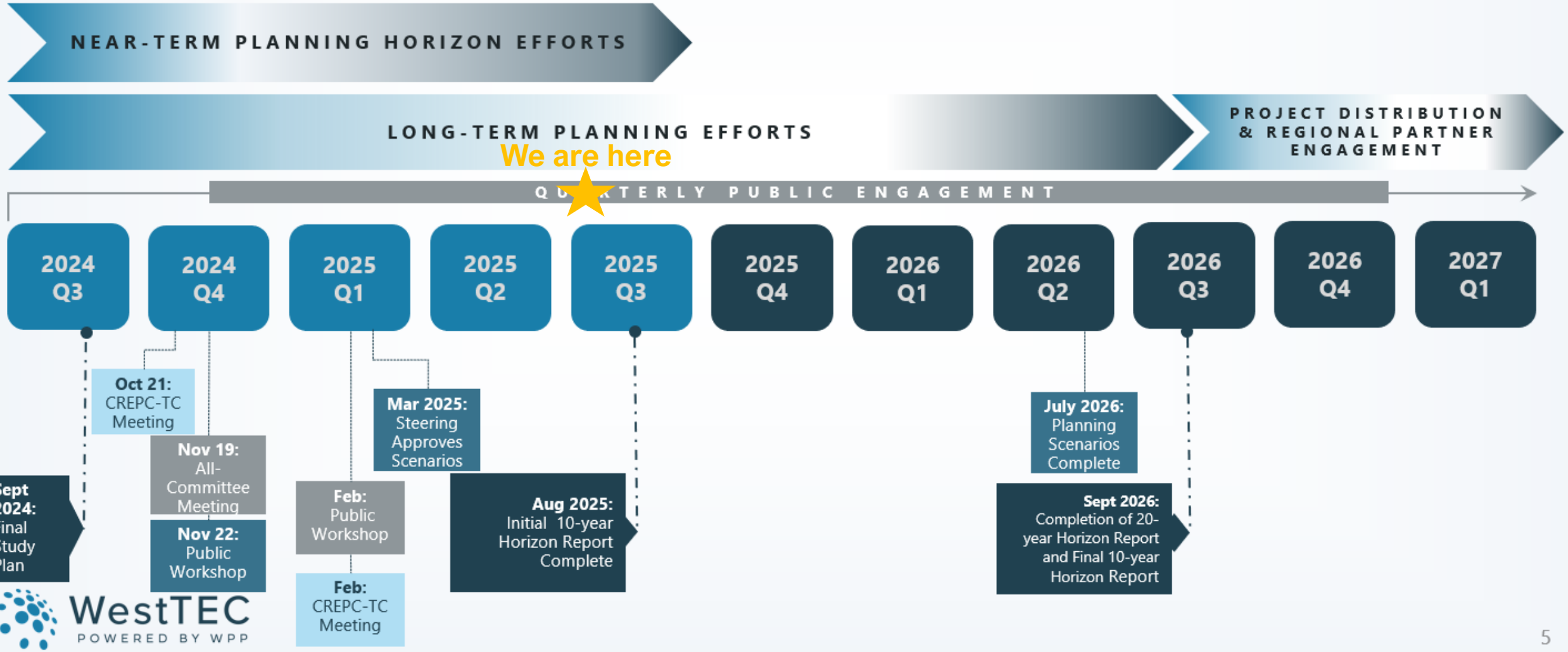
Energy Strategies REC Update

June 12th, 2025 Meeting

REC Feedback Prompts (10-15 mins)

- How do you feel WestTEC is going?
- How well do you feel you understand the process?
- Has the level of communication with REC met your expectations?
- How can consultants improve your experience moving forward?
- How are we falling short of your expectations?
- Have you raised a concern that hasn’t been addressed?
- Red flags/deal breakers?
- How has the western transmission planning landscape changed since we started the study?

Study Timeline

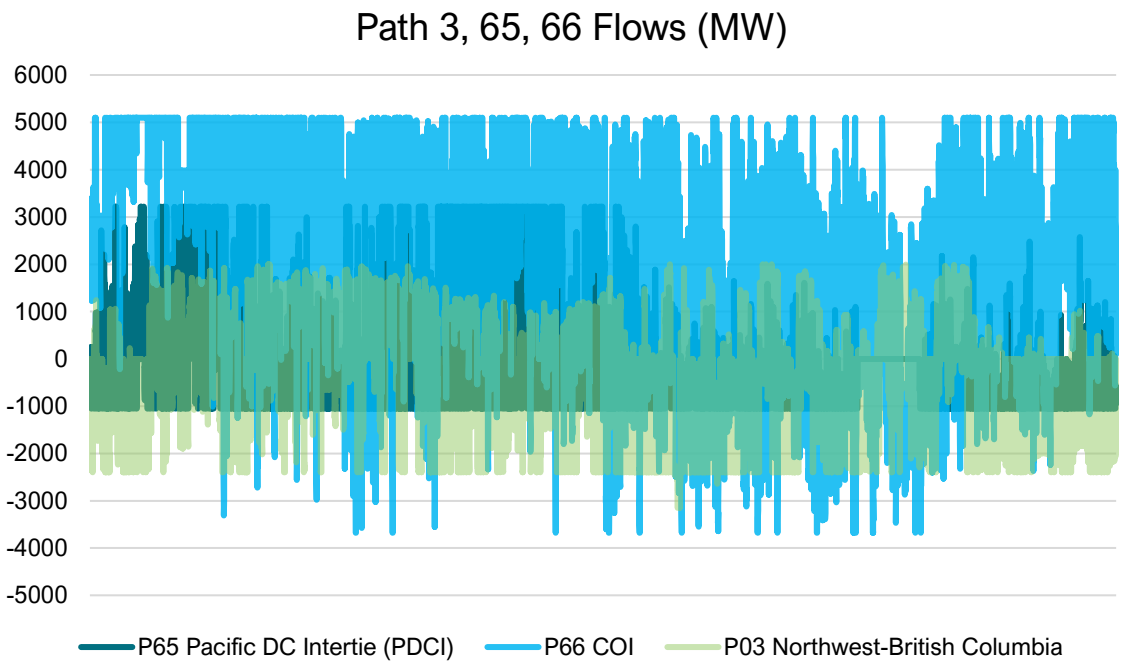


Congestion Penalty Issue

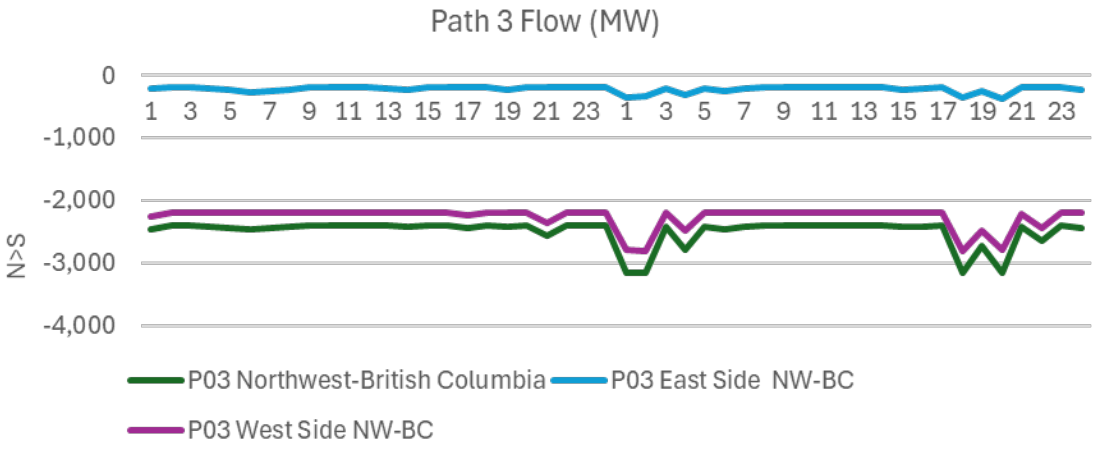
10-Year Study Updates

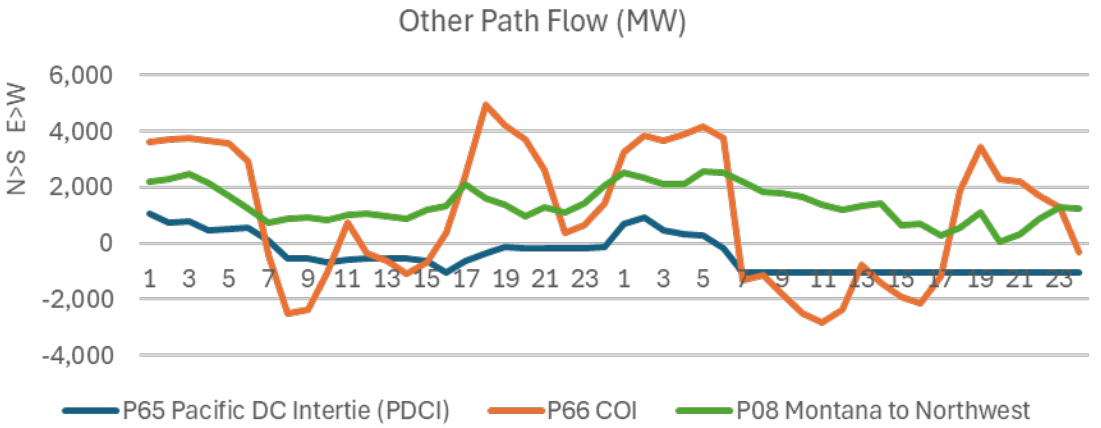
Other system congestion during times of Path 3 overloading (Pre-BC Hydro Weekly Energy Allocation)

- There is not a high correlation between flows on Path 3 and flows on COI, PDCI, or Path 8.



July 28 and 29

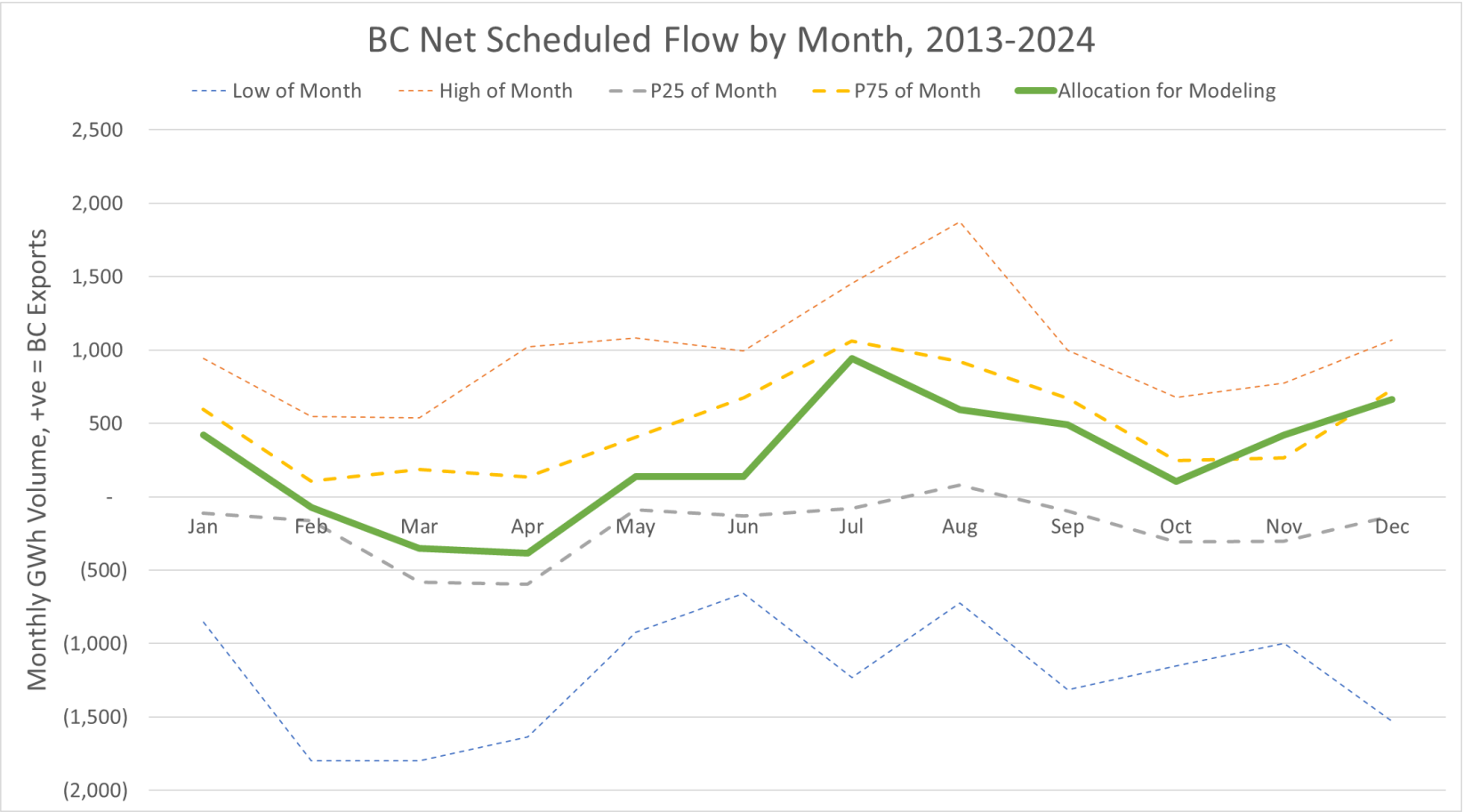




BC Hydro Implementation and Validation

10-Year Study Updates

BC Monthly Interchange 2013 to 2024



- Annual Net Interchange has ranged from
  -10,750GWh to +7,350GWh
- Model uses +3100 GWh
- Very large historical range of Imports/Exports by month
- Dependent on external market signals and annual snow/water conditions

Proposed Deliverability Scenarios

10-Year Study Updates

Powerflow Assessments will identify many of the study's transmission needs

- **System Reliability Assessment (SRA)** is a holistic system analysis that focuses on three system conditions that address unique load & resource conditions: Summer peak load, winter peak load, and max renewable
  - Ensures that the Western transmission system has interregional and interarea transmission sufficient to ensure the grid is robust and flexible enough to manage complex stressed conditions
    - Requires focusing on the most severe and credible conditions that could impact the Western region
  - WestTEC will leverage hourly wind, solar, and load data to explore various load and generation dispatch conditions, adopting a data driven approach to reflecting stressful operational patterns
  - SRA focuses on steady-state contingency analysis with monitoring for thermal and voltage limit violations

- **Interarea Deliverability Assessment (IDA)** is a targeted analysis that identifies transmission needed to ensure resources can be reliably transferred to load in expected quantities during times of system need
  - Ensures that resources that are needed to support resource adequacy have the transmission to do so
  - Will not be performed for every area
    - WATT will review study results and will decide which areas may benefit from IDA
  - Will not focus on intra-area transmission constraints
  - IDA will focus primarily on transmission constraints associated with
    - Zones that are critical exporters of energy,
    - Zones that may be transmission short and generation long;
    - Zones that may require the import of power during system stress events

Transfer-based Deliverability Workflow

Assess system reliability under unique grid conditions causing major interregional transfers

Define conditions

- Review of preliminary PCM results / dispatch
- Seeking conditions that result in high interregional flows
- Stakeholder input supported by data & analysis

Constrain and setup TARA

- Custom Source/sink modeling for each scenario
- Scaling of source/sinks bounded by constraints sourced from GridView or other data

Solve TARA models for high transfer conditions

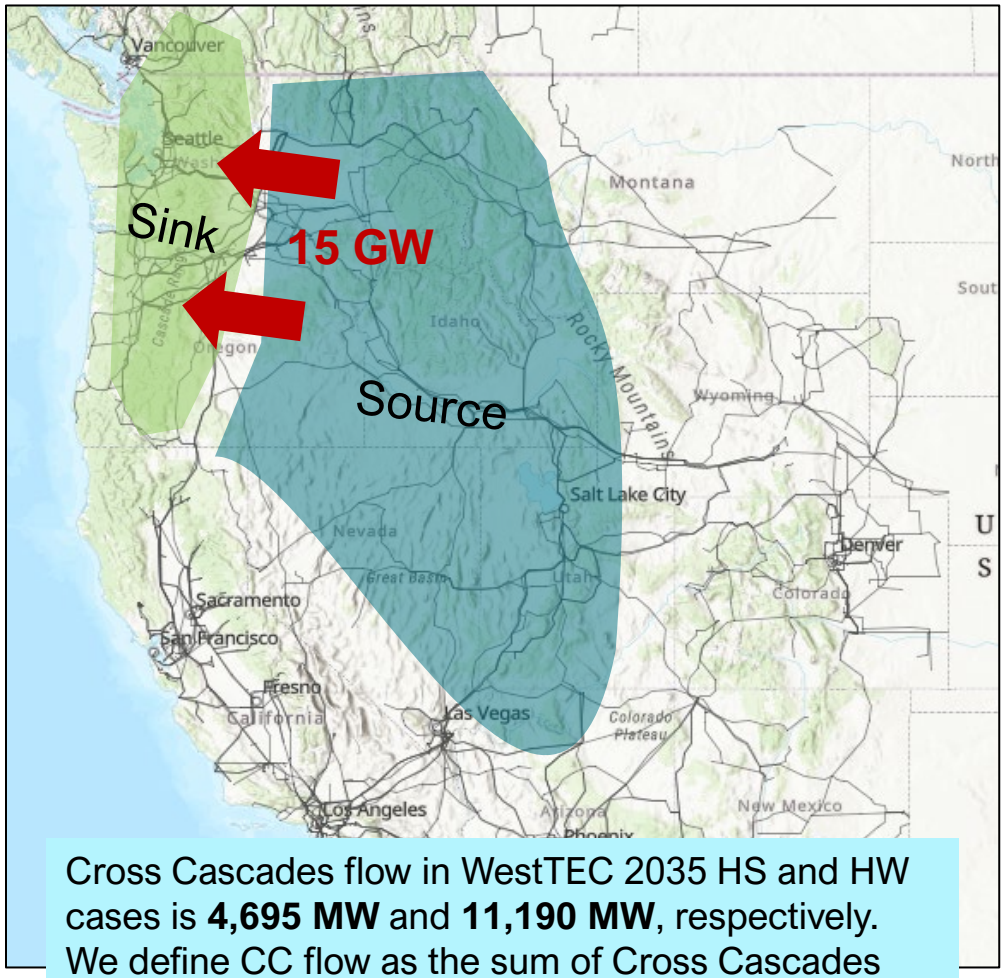
- Make the following adjustments as necessary:
  - Add reactive support
  - Adjust location of conceptual generation
  - Adjust loads
  - Add new transmission projects

Perform N-1 contingency analysis

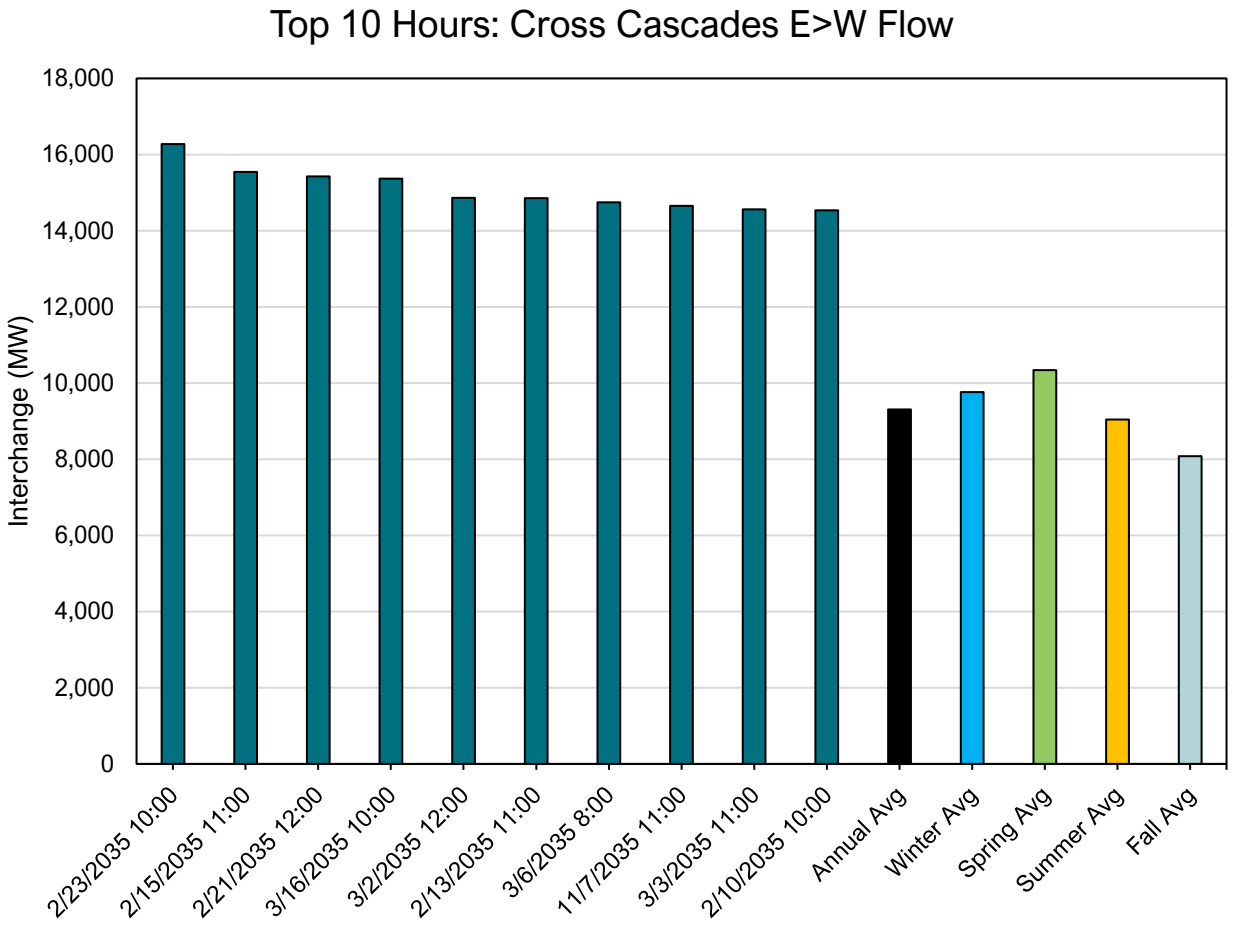
- Same contingencies as SRA (N-1 only for transfer analysis)
- Study will identify multiple elements that limit transfer conditions and will seek solution for all of them

- Transfer analysis helps assess system performance of interregional import and export capabilities during high regional power transfer scenarios that will arise when geographic diversity is needed to manage volatility and uncertainty in power supply. Since generation patterns will significantly shift between day and night, hour to hour, as well as seasonally, the ability of load in one area to be supported by generation from a remote area will become increasingly important for ensuring ongoing system reliability.

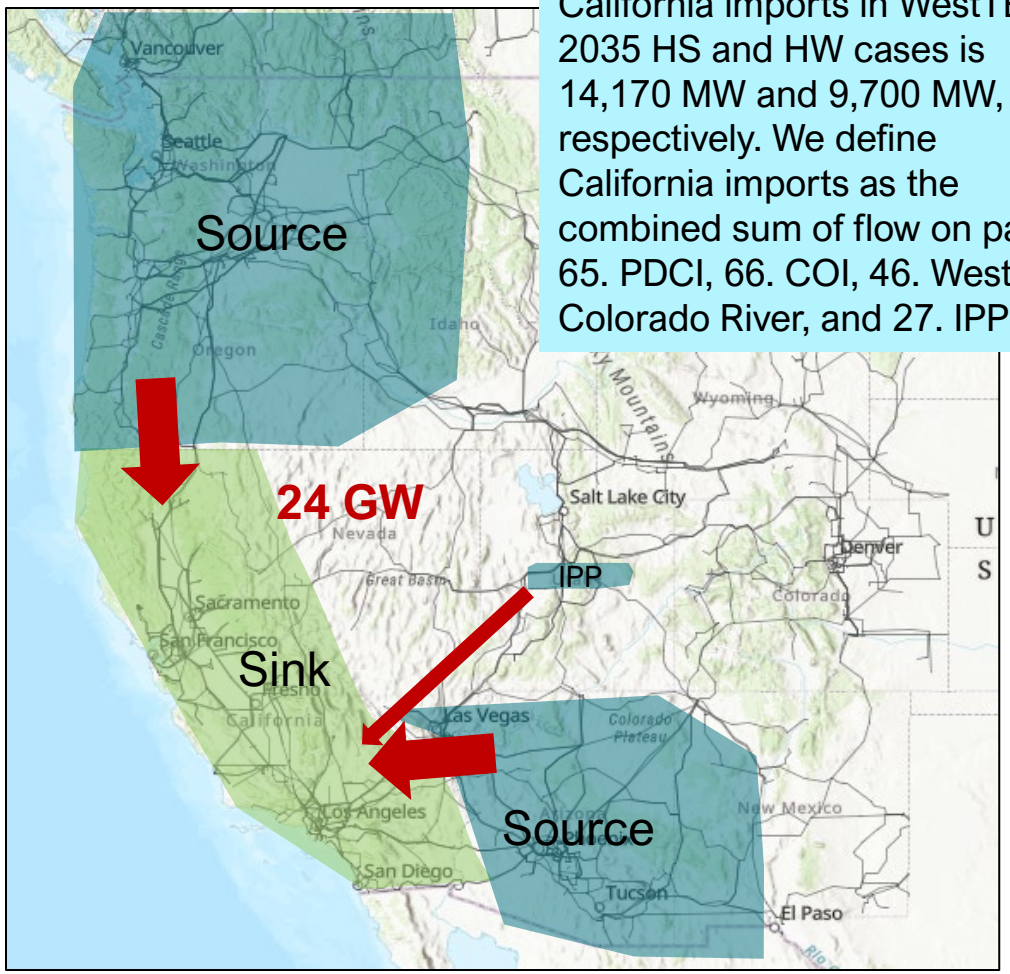
High Cross Cascades scenario captures hours where PNW coastal loads rely heavily on imports



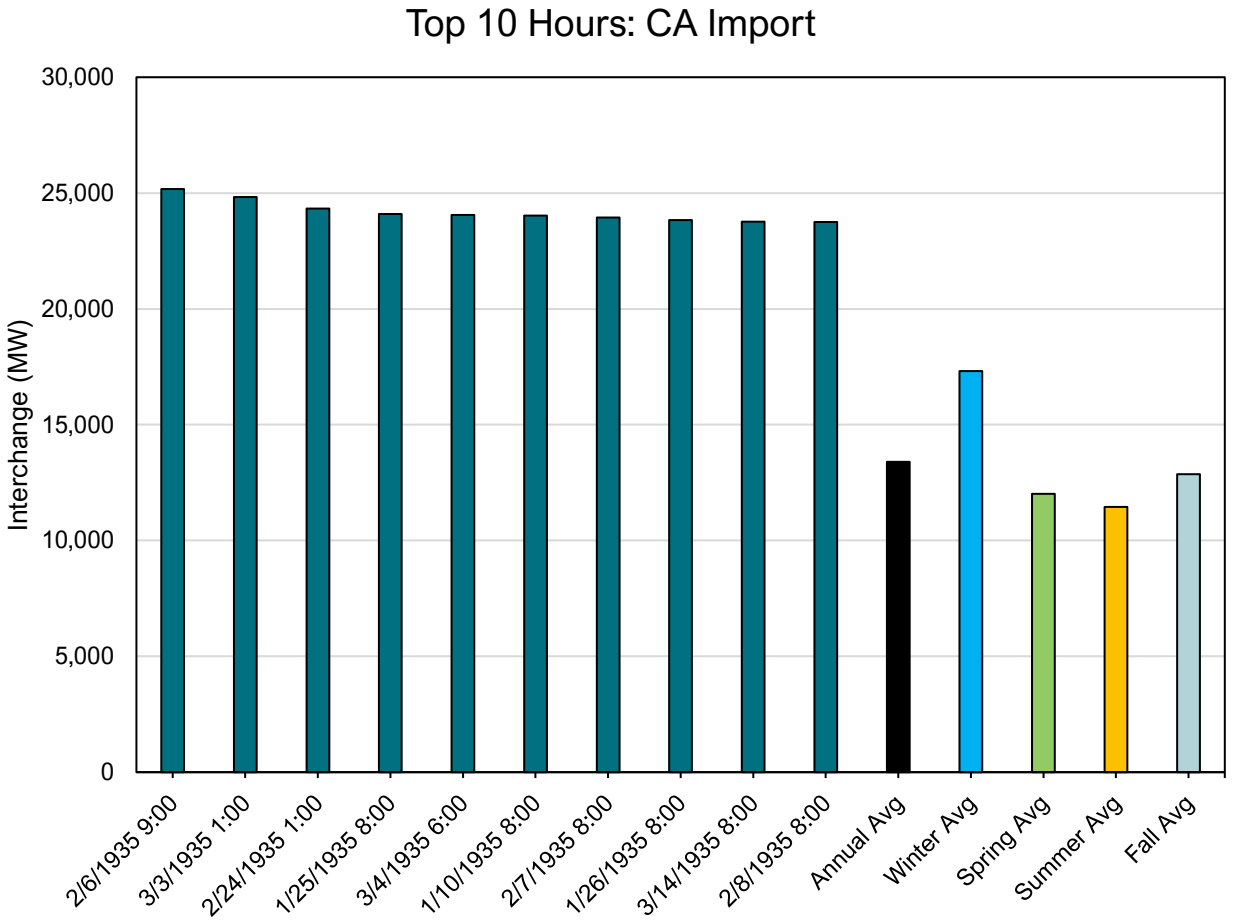
Cross Cascades flow in WestTEC 2035 HS and HW cases is **4,695 MW** and **11,190 MW**, respectively. We define CC flow as the sum of Cross Cascades North and Cross Cascades South.



High California Imports



California imports in WestTEC 2035 HS and HW cases is 14,170 MW and 9,700 MW, respectively. We define California imports as the combined sum of flow on paths 65. PDCI, 66. COI, 46. West of Colorado River, and 27. IPP DC.



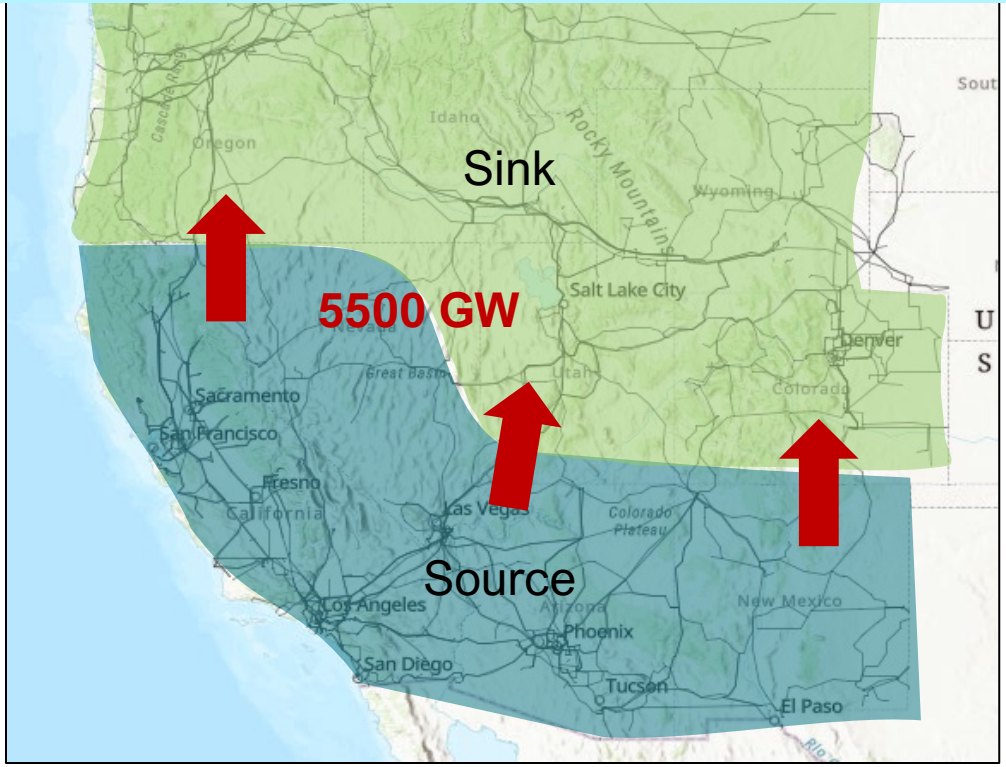
High California Imports

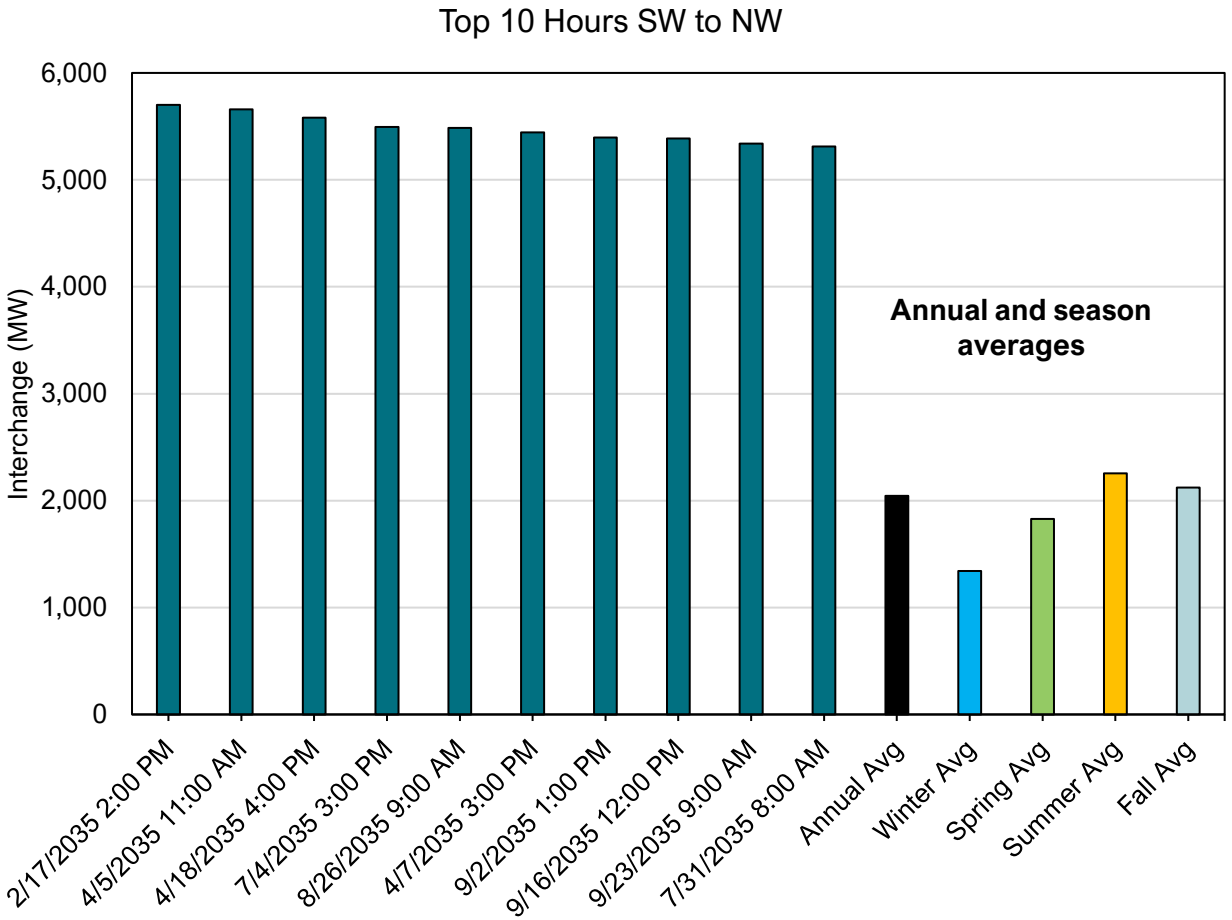
- During High CA import scenario 3 hours have Paths 46, 65, and 66 all congested
- Path Limits
  - 27. IPP DC
    - UT > CA: 2400
    - CA > UT: 1400
  - 46. West Of Colorado River
    - E > W and W > E: 14,450
  - 65. Pacific DC Intertie
    - N > S: 3,220
    - S > N: 1,050
  - 66. COI
    - N > S: 5,100
    - S > N: 3,675

Path (MW flow)	27. IPP DC	46. WOR	65. PDCI	66. COI
2/6/2035 9:00 am	2,400	14,450	3,220	5,100
3/3/2035 1:00 am	2,053	14,450	3,220	5,100
2/24/2035 10:00 am	2,400	13,606	3,220	5,100

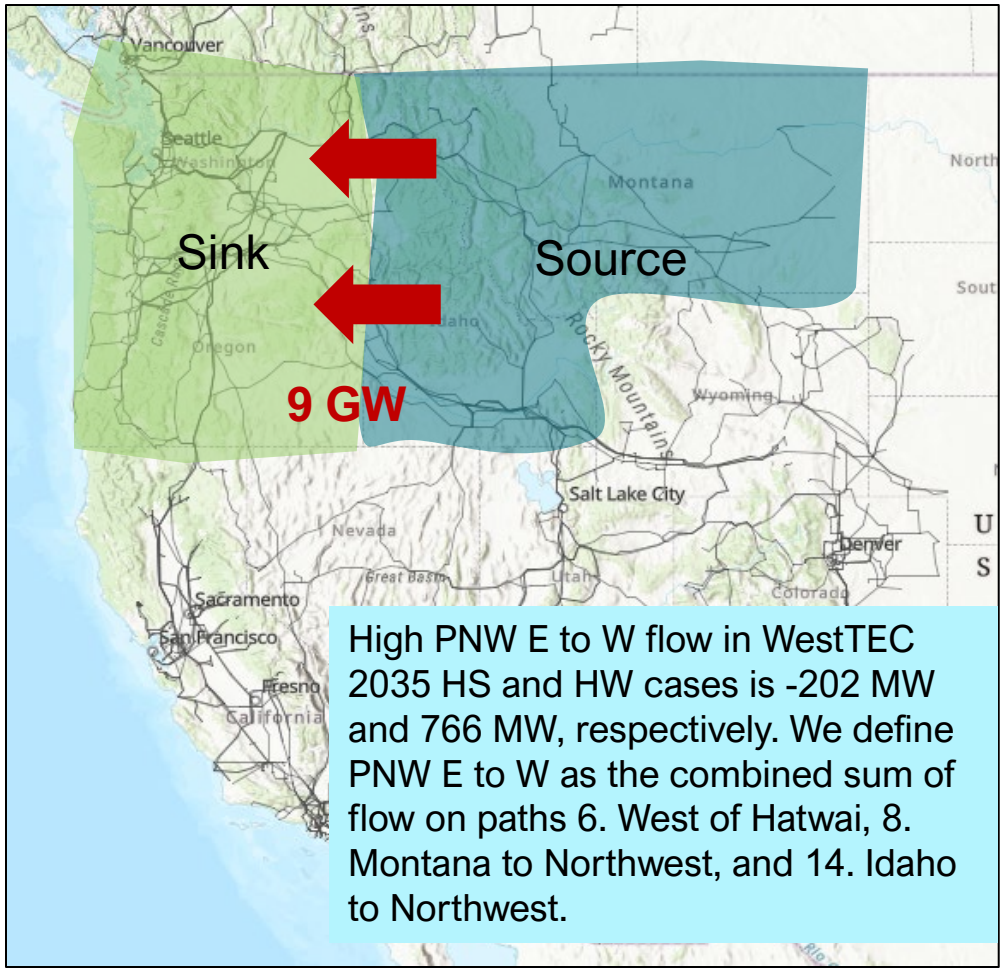
High Southwest to Northwest Flows

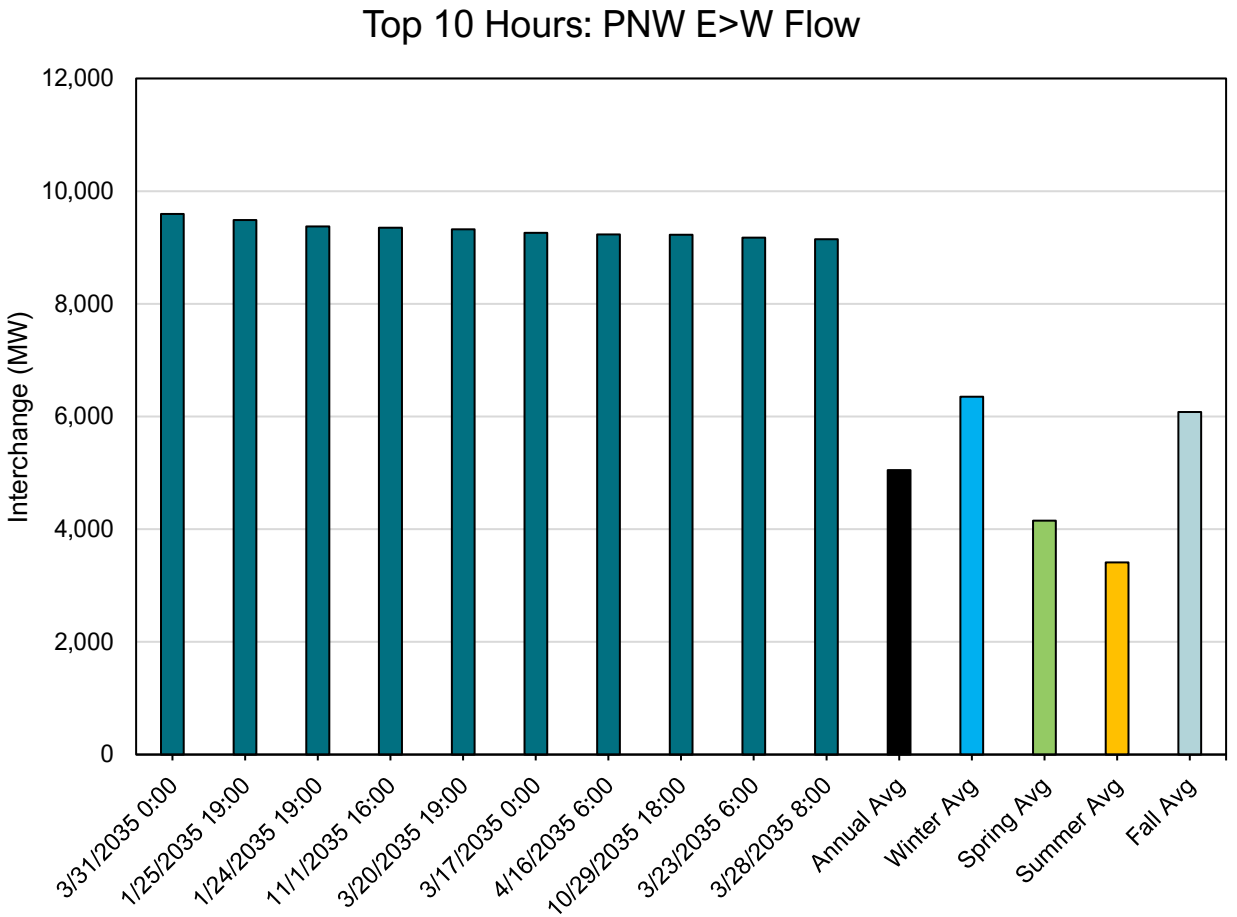
High SW to NW flows in WestTEC 2035 HS and HW cases is 6,170 MW and 2,150 MW, respectively. We define High SW to NW flows as the combined sum of flow on paths 65. PDCI, 66. COI, 78. TOT2B1, 79. TOT2B2, and 31. TOT 2A.





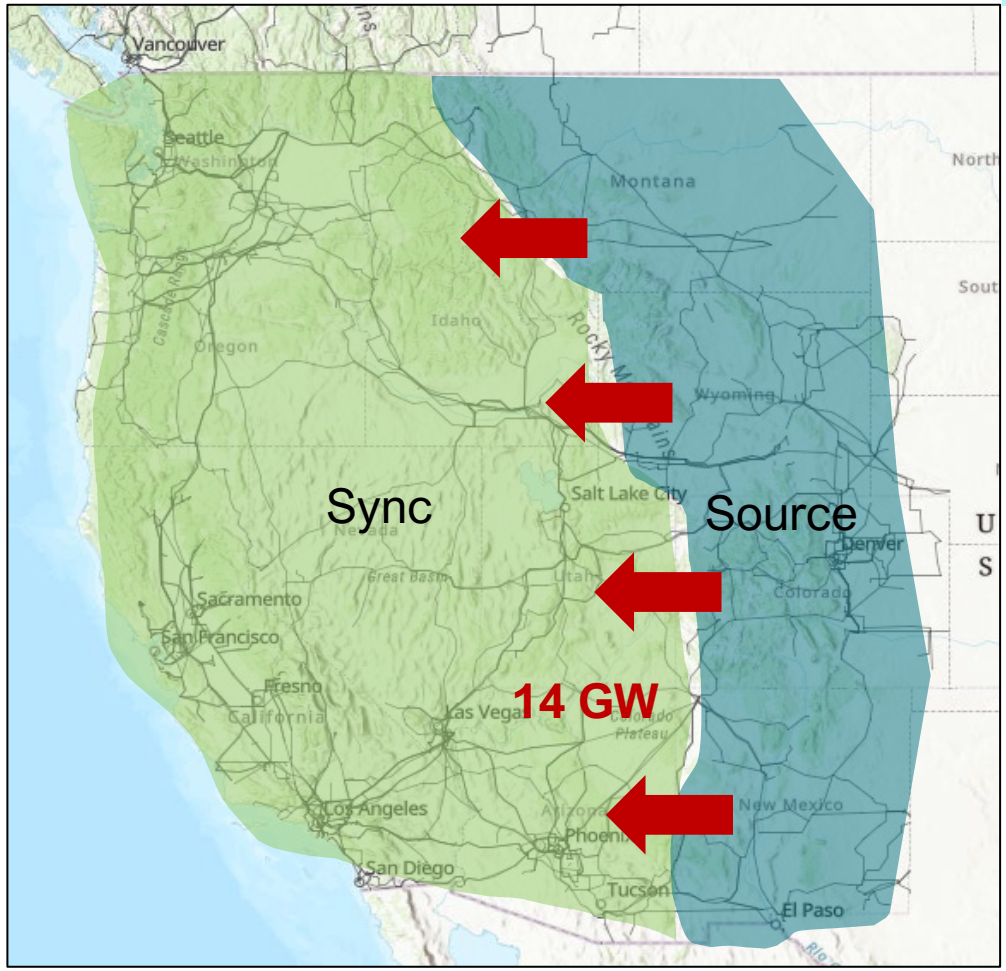
High Pacific Northwest East to West Flow

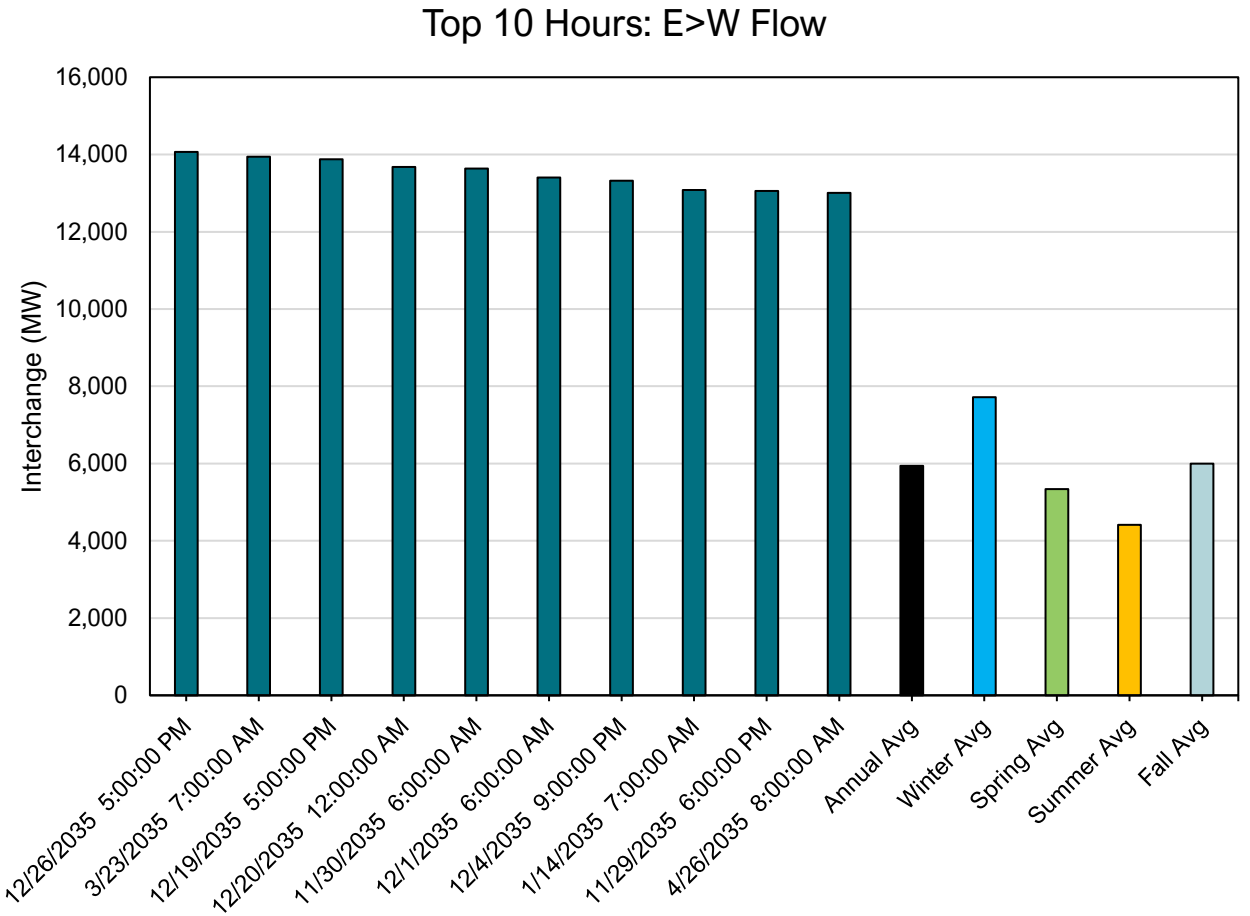




High East to West Flow

High E to W flows in WestTEC 2035 HS and HW cases is 9,420 MW and 10,270 MW, respectively. We define high E to W flows as the combined flow from NWMT, PAC WY, WACM, and PNM to BPA, AVA, IPCO, PAC UT, PAC ID, AZPS, WALC, SPR, and TEP.





Recommendations

We propose the following IDA conditions:

1. High East to West Flow
   - Captures known grid constraints in NM, Wyoming, and Montana, considering need to move power Westward
     - Generally exporting areas
   - Explores related issues when Colorado is exporting significant wind
2. High Cross Cascades
   - Explores growing need to transfer power across critical constraints
   - Projects are planned in Reference Case, but unclear if this is sufficient capacity
   - IRPs in region indicate long-term need for expansion
3. High California Imports
   - Very high imports observed – unclear if system can accommodate this level reliably
   - IRPs in region indicate long-term need for expansion

Identified these based on:

- Understanding of current and evolving transmission constraints in the region identified in IRPs and other long-range transmission studies
- Location and amount of conceptual resources added to create 2035 Reference Case
- Preference to have a geographically diverse set of inter-area transmission studies

Recognize:

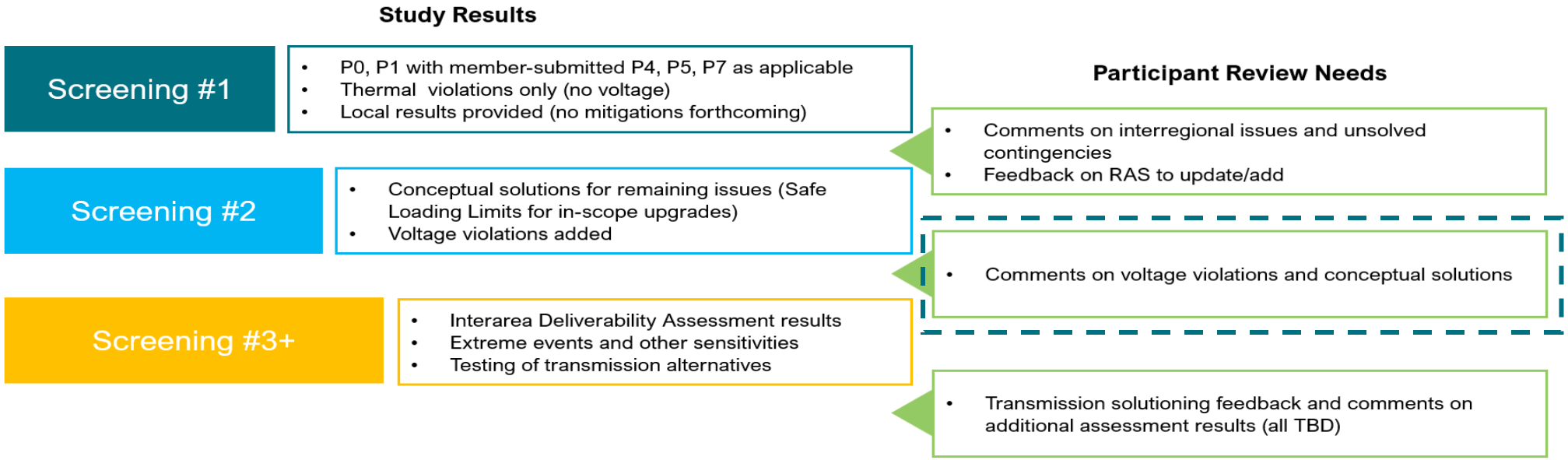
- IDA is not the only assessment – the summer, wind, wind, and solar SRA cases could identify issues, as well as the congestion assessment
- A key purpose of this work is to prepare ourselves to perform this analysis on a 20-year horizon

Screening #2 Update

10-Year horizon updates

Update on Screening #2 Results

- Energy expects to post the high solar and high wind power flow cases and contingency analysis results on June 27th.
- Screening #2 results will include:
  - An updated list of local and inter-regional overloads
  - Local and inter-regional voltage violations
  - Conceptual solutions to mitigate violations



Busbar Mapping

20-Year Study

Approach to Busbar Mapping

20-Year Resource Portfolio	Energy Strategies Busbar Mapping Process	WATT Review & Adjustments	Nodal Resource Busbar Mappings
• Zonal PLEXOS outputs; need to be assigned to buses	• Energy Strategies' busbar mapping decisions will be treated as suggestions	• WATT will have final authority over busbar mapping decisions	• Used in 20-Year Reference Case Congestion & Reliability Studies

Busbar Mapping Timeline

- E3 delivered 20-year reference case resource portfolio **on Tuesday, June 3rd**
- 15 business-day WATT review period: **Tuesday, June 3rd – Friday June 20th**
  - Review period included a methodology whitepaper, workbook, and interactive maps outlining Energy Strategies efforts
    - Files uploaded to the WestTEC Sharepoint > WATT > Reference Case Data and Review > 20-Year Busbar Mapping (link)
  - WATT reviewers have the opportunity to review, comment, and adjust siting decisions for the 20-year reference case
- Present outcomes of WATT review in WATT meeting **on Tuesday, June 24th**
- Finalize 20-year reference case busbar mapping **by Friday, July 4th.**

Busbar Mapping Working Sessions

- Energy Strategies consultants facilitated these *optional* sessions open to WATT members
  - Session 1: California & Desert Southwest (CA, AZ, NM, NV) (complete)
    - **Wednesday, June 4th at 10:00 – 11:00am MT**
  - Session 2: Northwest (WA, OR, ID, MT) (complete)
    - **Friday, June 6th at 10:00 – 11:00am MT**
  - Session 3: Basin & Rockies (ID, UT, WY, CO) (complete)
    - **Tuesday, June 10th at 10:00 – 11:00am MT**
- Meeting recordings available on Sharepoint
- Please submit remaining comments and re-mappings by using the template in the WATT review workbook

Open Items (Map)

- California
  - Energy Strategies is aligning 24-25 TPP portfolio with 20-year reference case resources.. We will site resources through 2039 consistent with TPP and work with California reviewers to site incremental capacity needed through 2045
- Southwest
  - Plan to re-site batteries across more commercial interest buses
  - Some of group concerned about wind in APS
- Northwest
  - Plan to work with Northwest leads to site ~5GW hydrogen in the PNW_Core regions in WA/OR
  - Some of group concerned about limited value of 4-hour storage
  - Some of group concerned about limited 20-year wind buildout in Montana

Thank you. Questions?

Updates from Energy Strategies/WATT Work

Next Steps

- Next REC meeting July 10th
- Any feedback on scenario development, please email GDS:
  - gillian.biedler@gdsassociates.com
  - kyra.green@gdsassociates.com

Public Comment