



PCDS Meeting

February 28, 2024

WECC Staff

Announcements

- 2034 ADS PCM V1 —First run complete
- BTM PV —Received the county information from PNNL, now sent to NREL for BTM PV ratios/weightings for each bus
- 2034 L&R update
- No new methods or algorithms from NREL on 2018 data
- March 20 StS meeting—2023 Study Program presentations

Start Costs—Intertek

2020 Dollars

Unit Types	Coal - Small Sub Critical	Coal - Large Sub Critical	Coal - Super Critical	Gas - Steam	Gas - Large Frame CT	Gas - Aero Derivative CT	Typical CC [GT+HRSG+ST]	High Eff. - CC [GT+HRSG+ST]	Fast Start - CC [GT+HRSG+ST]	Gas - Recip. [per Engine]
Typical Cold Start Data										
-C&M cost (\$/MW cap.)										
Median	144	114	126	67	57	28	75	84	72	10
~25th_centile	92	66	85	57	20	11	41	46	39	6
~75th_centile	333	159	154	104	138	66	117	157	112	15

2024 Dollars

Unit Types	Coal - Small Sub Critical	Coal - Large Sub Critical	Coal - Super Critical	Gas - Steam	Gas - Large Frame CT	Gas - Aero Derivative CT	Typical CC [GT+HRSG+ST]	High Eff. - CC [GT+HRSG+ST]	Fast Start - CC [GT+HRSG+ST]	Gas - Recip. [per Engine]
Typical Cold Start Data										
-C&M cost (\$/MW cap.)										
Median	177	155	163	90	73	35	108	111	93	14
~25th_centile	113	99	116	76	26	14	59	61	50	8
~75th_centile	408	238	210	139	177	83	169	207	145	21

Start Cost Compare

2020\$ to 2024\$ Inflator										
1.1953										
Start Costs - Intertek										
	Coal-Small Sub Critical	Coal-Large Sub Critical	Coal-Super Critical	Gas-Steam	Gas-Large Frame CT	Gas-Aero Derivative CT	Typical CC [GT+HRSG+ST]	High Eff. CC [GT+HRSG+ST]	Fast Start CC [GT+HRSG+ST]	Gas-Recip [per Engine]
Old 2020\$	144	114	126	67	57	28	75	84	72	10
Old 2024\$	172	136	151	80	68	33	90	100	86	12
New 2024\$	177	155	163	90	73	35	108	111	93	14
% Change	3%	12%	8%	11%	7%	4%	17%	10%	7%	15%

VOM Costs—Intertek

2020 Dollars

Unit Types	Coal - Small Sub Critical	Coal - Large Sub Critical	Coal - Super Critical	Gas - Steam	Gas - Large Frame CT	Gas - Aero Derivative CT	Typical CC [GT+HRSG+ST]	High Eff. - CC [GT+HRSG+ST]	Fast Start - CC [GT+HRSG+ST]	Gas - Recip. [per Engine]
Typical Non-cycling Related Costs										
- Baseload Variable Cost (\$/MWH)										
Median	1.79	2.40	3.76	0.29	0.56	0.45	2.10	1.80	1.72	0.00
~25th_centile	1.14	1.62	3.15	0.24	0.47	0.18	1.65	1.27	1.30	0.00
~75th_centile	2.70	3.42	4.79	1.74	1.10	0.66	4.42	4.40	4.53	0.00

2024 Dollars

Unit Types	Coal - Small Sub Critical	Coal - Large Sub Critical	Coal - Super Critical	Gas - Steam	Gas - Large Frame CT	Gas - Aero Derivative CT	Typical CC [GT+HRSG+ST]	High Eff. - CC [GT+HRSG+ST]	Fast Start - CC [GT+HRSG+ST]	Gas - Recip. [per Engine]
Typical Non-cycling Related Costs										
- Baseload Variable Cost (\$/MWH)										
Median	2.20	3.30	5.10	0.40	0.80	0.60	2.80	2.40	2.30	
~25th_centile	1.40	2.20	4.30	0.30	0.60	0.20	2.20	1.70	1.70	
~75th_centile	3.30	4.70	6.50	2.30	1.50	0.90	5.90	5.90	6.10	

VOM Cost Compare

VOM - Intertek										
	Coal-Small Sub Critical	Coal-Large Sub Critical	Coal-Super Critical	Gas-Steam	Gas-Large Frame CT	Gas-Aero Derivative CT	Typical CC [GT+HRSG+ST]	High Eff. CC [GT+HRSG+ST]	Fast Start CC [GT+HRSG+ST]	Gas-Recip [per Engine]
Old 2020\$	1.79	2.4	3.76	0.29	0.56	0.45	2.1	1.8	1.72	0
Old 2024\$	2.14	2.87	4.49	0.35	0.67	0.54	2.51	2.15	2.06	0.00
New 2024\$	2.20	3.30	5.10	0.40	0.80	0.60	2.80	2.40	2.30	Blank
% Change	3%	13%	12%	13%	16%	10%	10%	10%	11%	0%

Approval Item

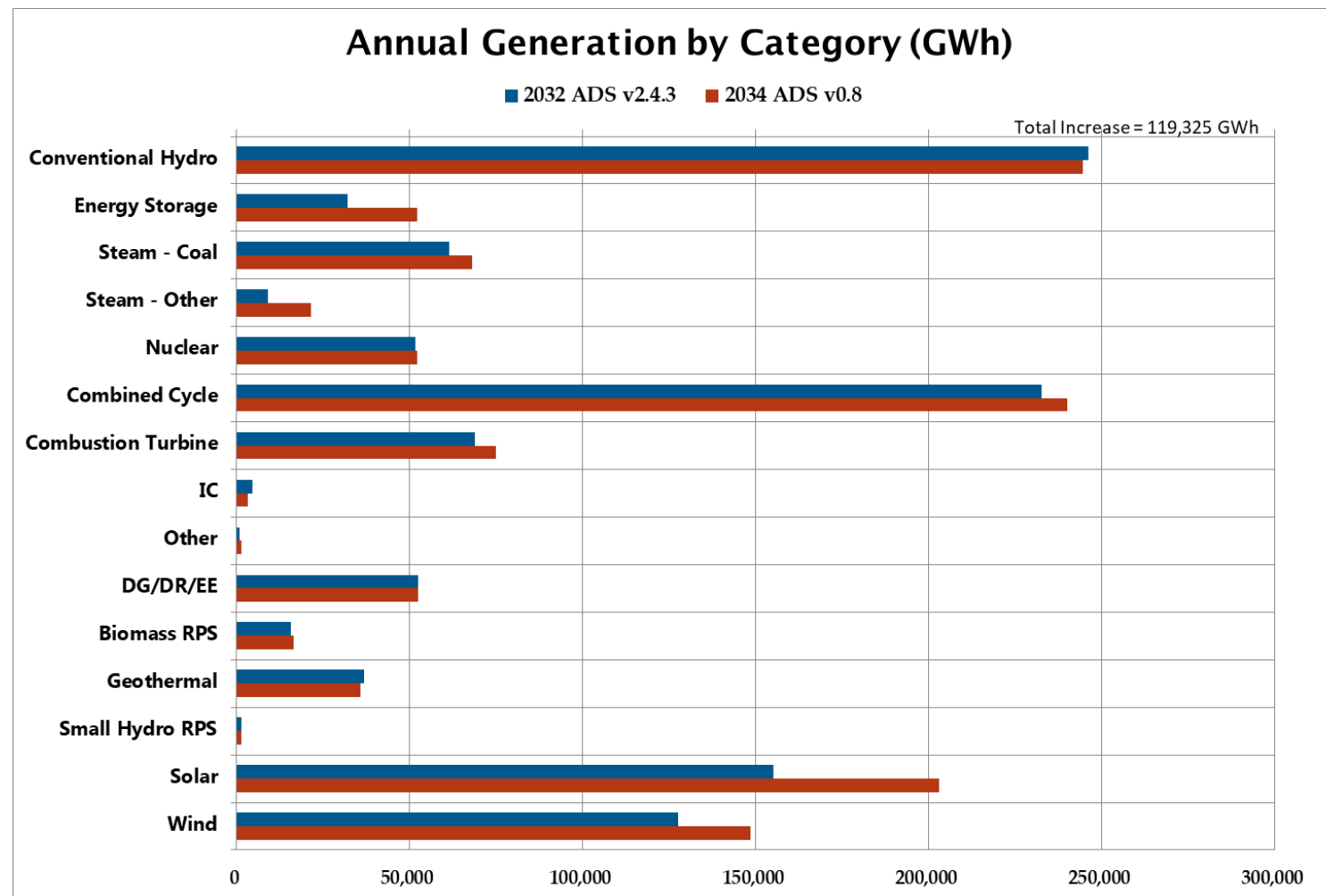
Use latest data from Intertek for VOM and Start Cost (February 2024)

2034 ADS V1

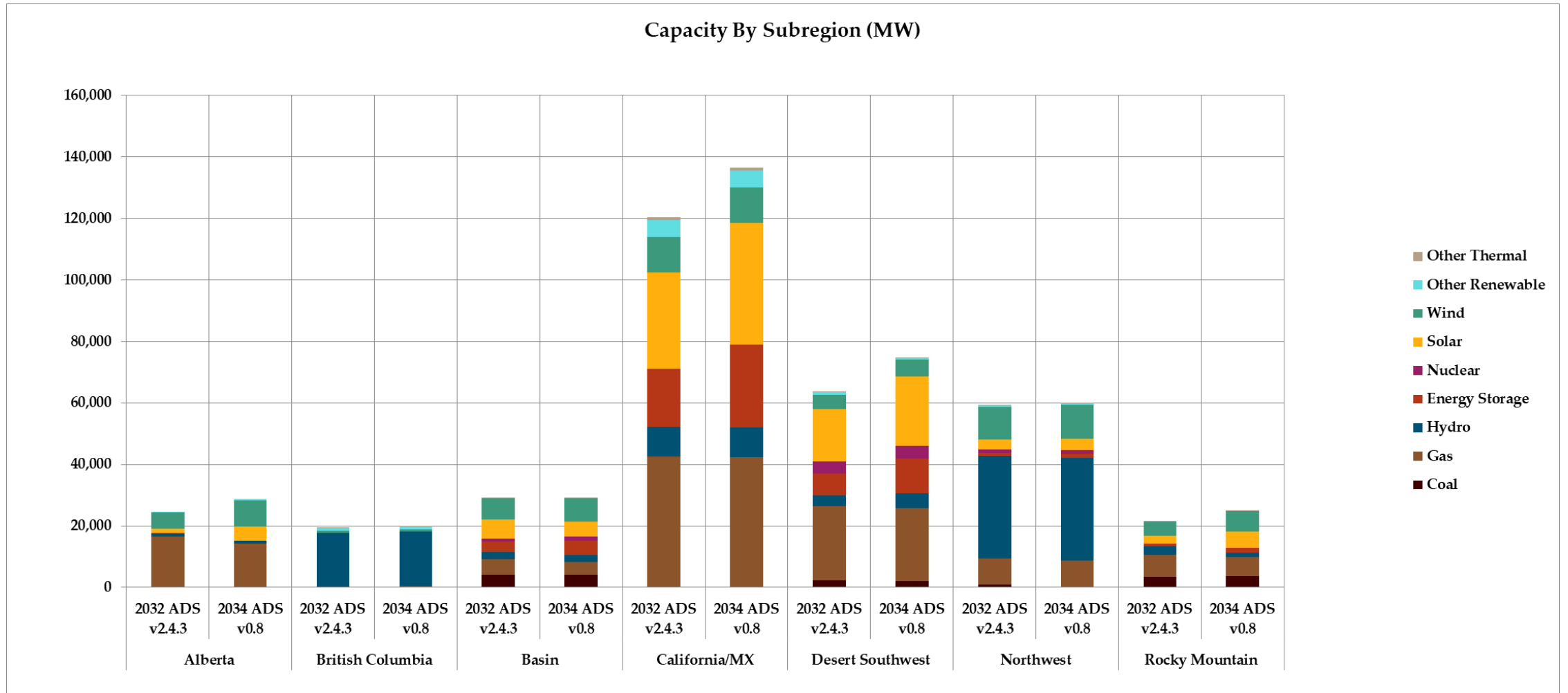
Assumptions

- 2034_ADS_PCM_2.4.3_V0.8
 - 2032 ADS PCM v2.4.3 Plus:
 - 2023 L&R submittal
 - Loads (PACW revised load)
 - Resources
 - Wheeling Rates
 - Nomograms
 - Path Ratings
 - Path Definitions
 - Fuel Prices
 - CO2 Prices
 - BTM PS
 - Inflator
 - Ownership updates from 2034HS1 Power Flow

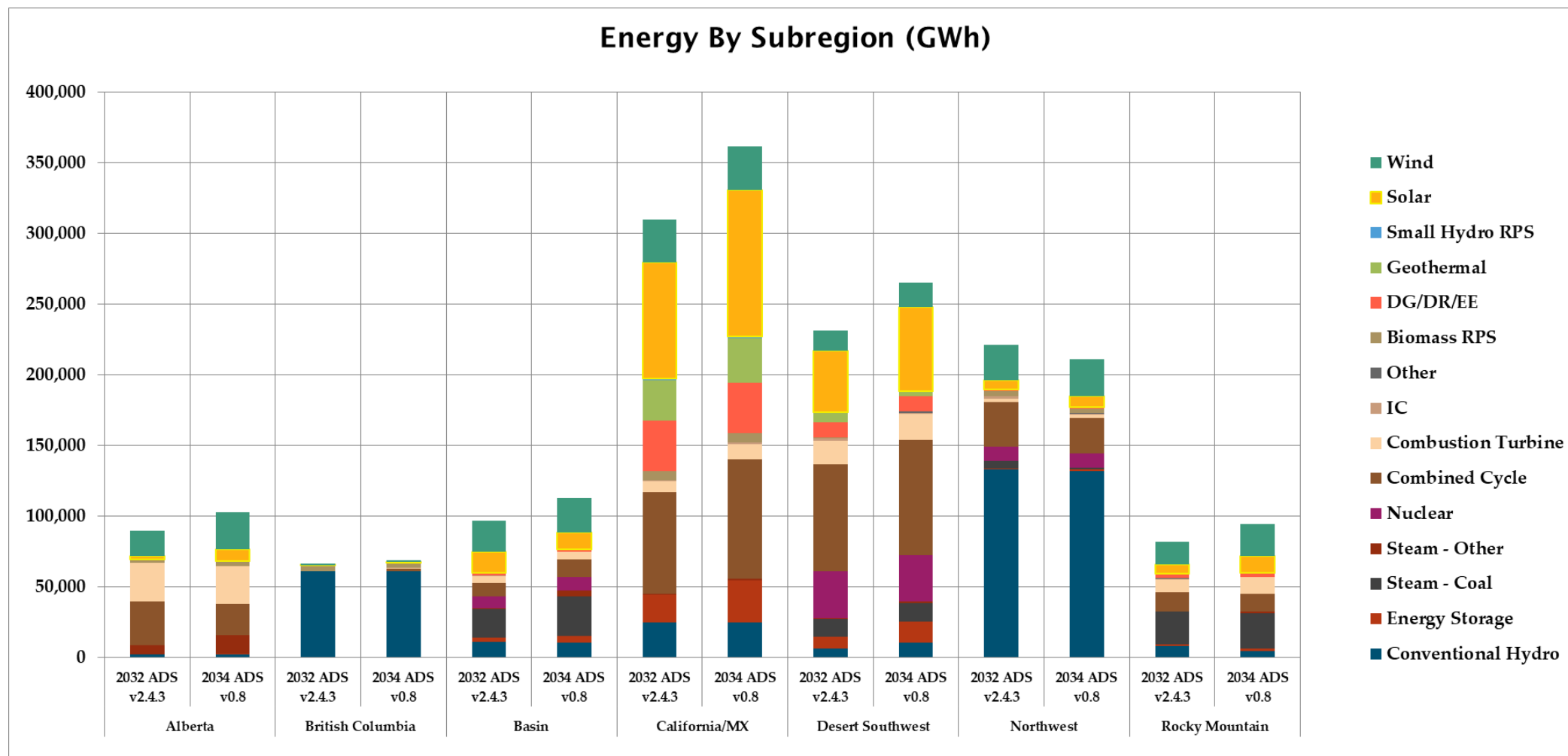
Annual Generation



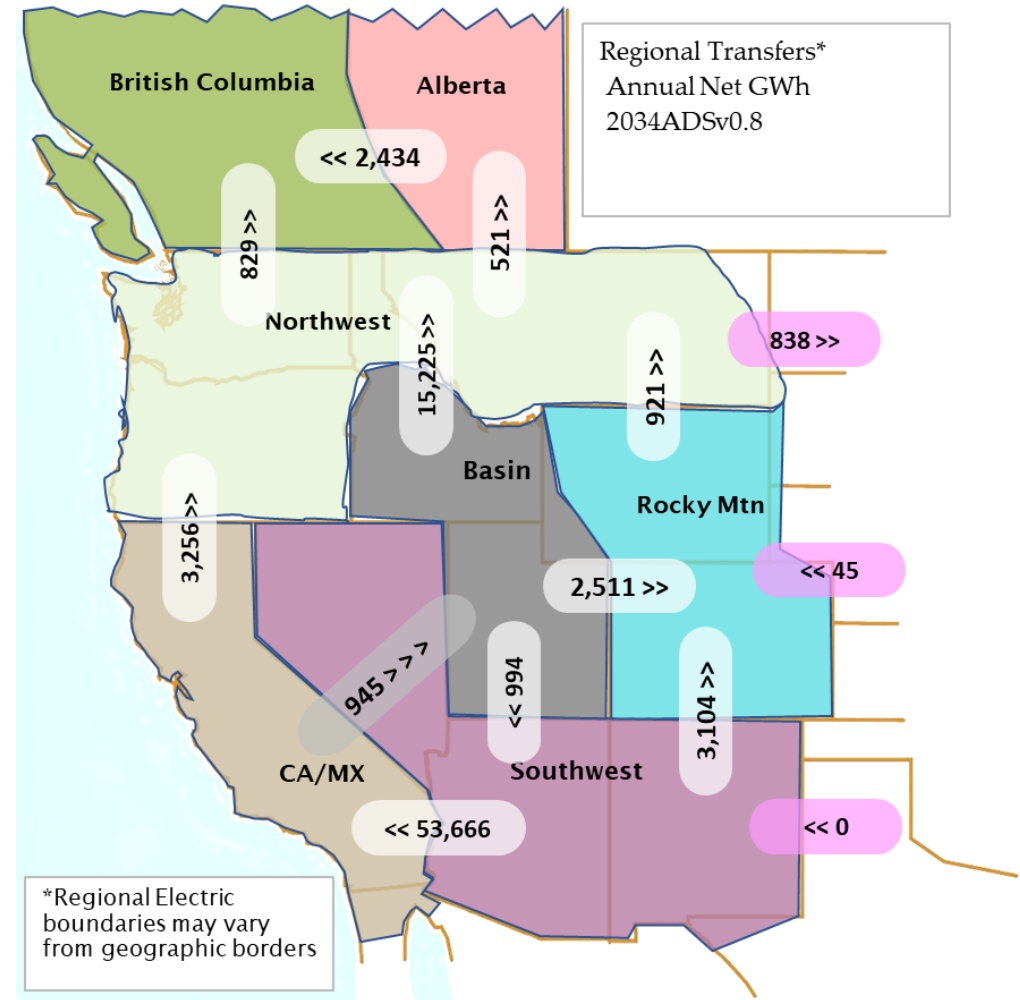
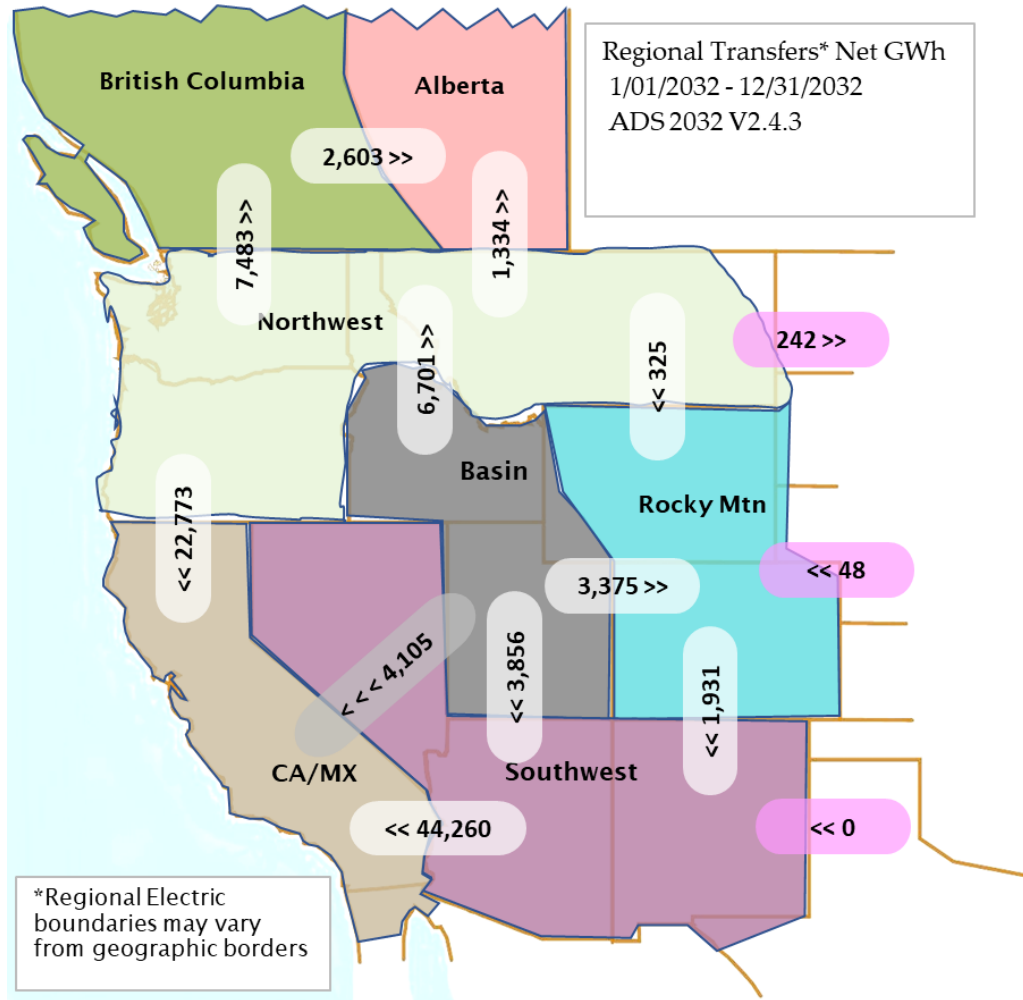
Capacity



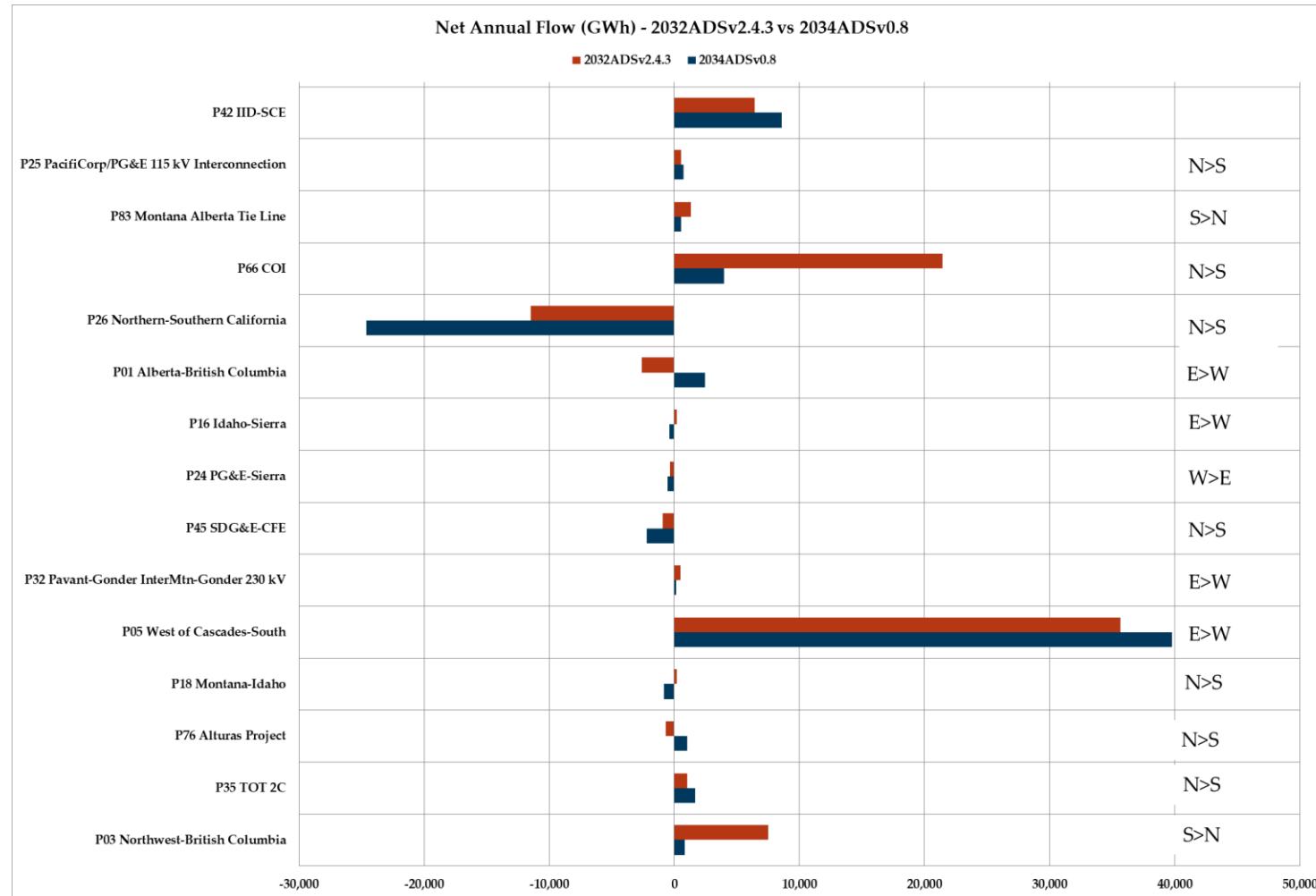
Energy By Subregion



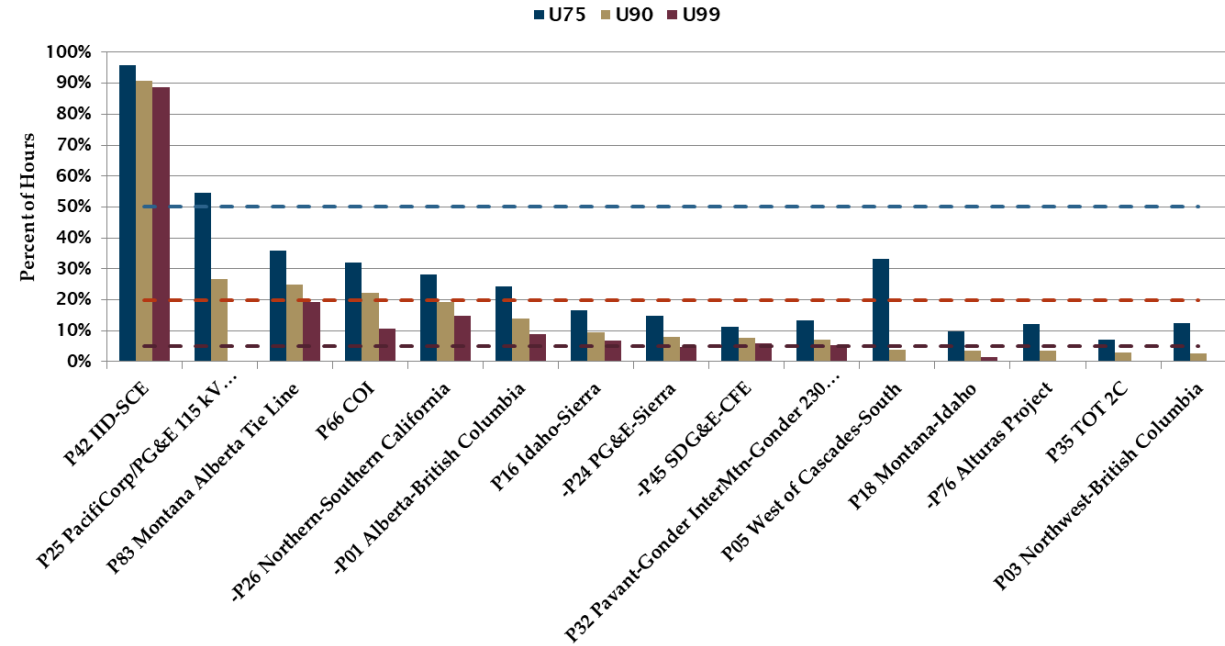
Regional Transfers



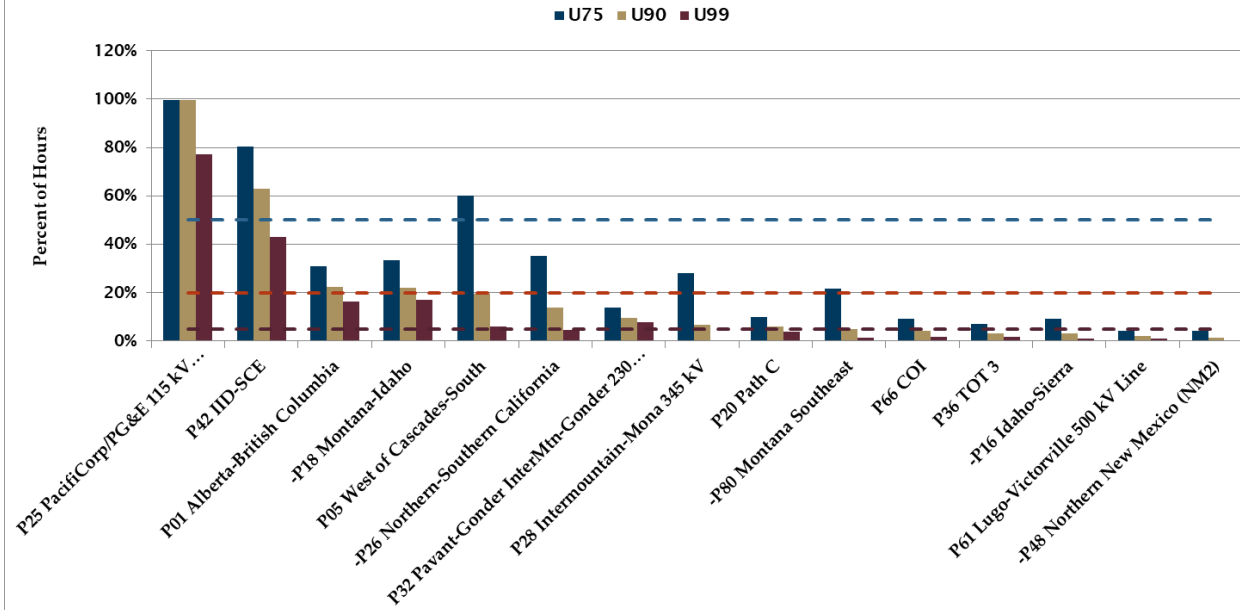
Net Annual Flow



Most Heavily Utilized Paths - 2032ADSv2.4.3



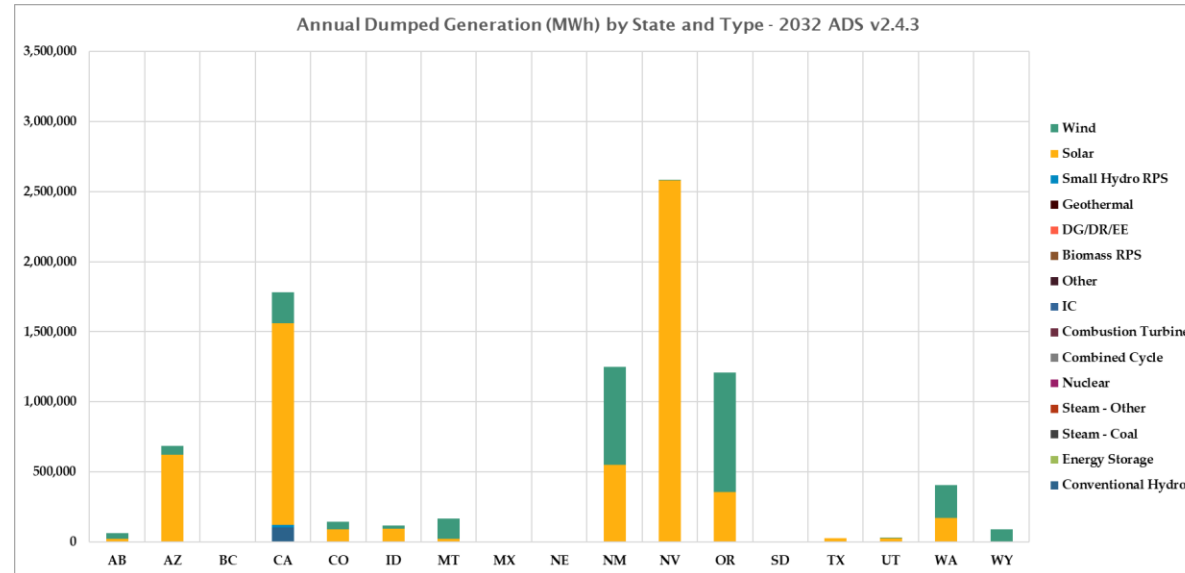
Most Heavily Utilized Paths - 2034ADSv0.8



Dumped Generation

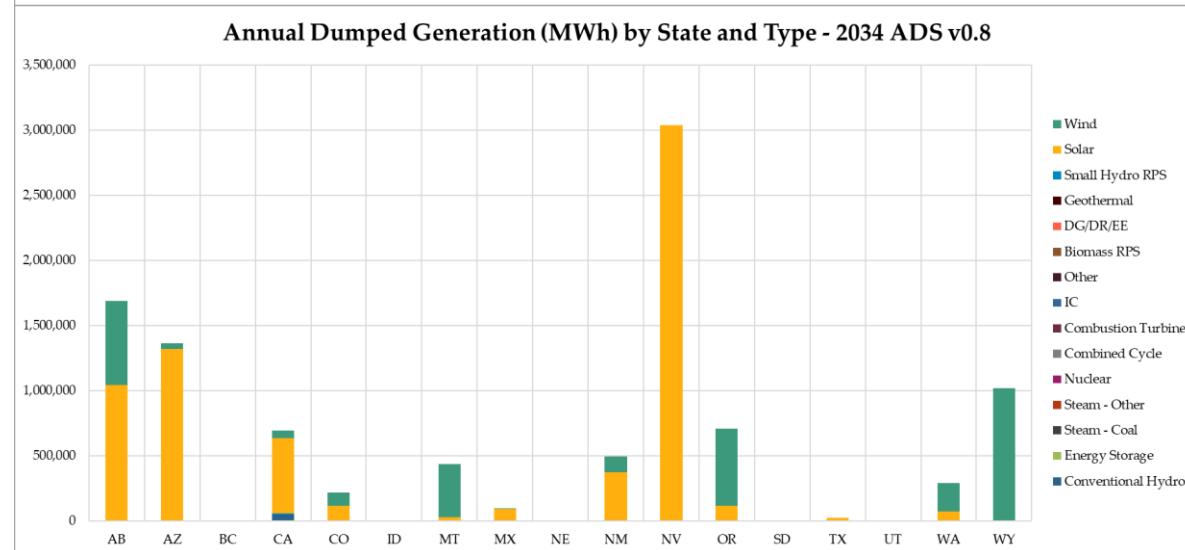
Total: 8,542,400 MWh

Curtailment %: 0.78%



Total: 10,071,551 MWh

Curtailment %: 0.83%



Approval Item

- Draft release — post to website this week to PCDS team site
 - Clarify in title/email that Loads and Resources are year 2033 for V1, and from 2034HS1 power flow

