WECC

2032 ADS Overview

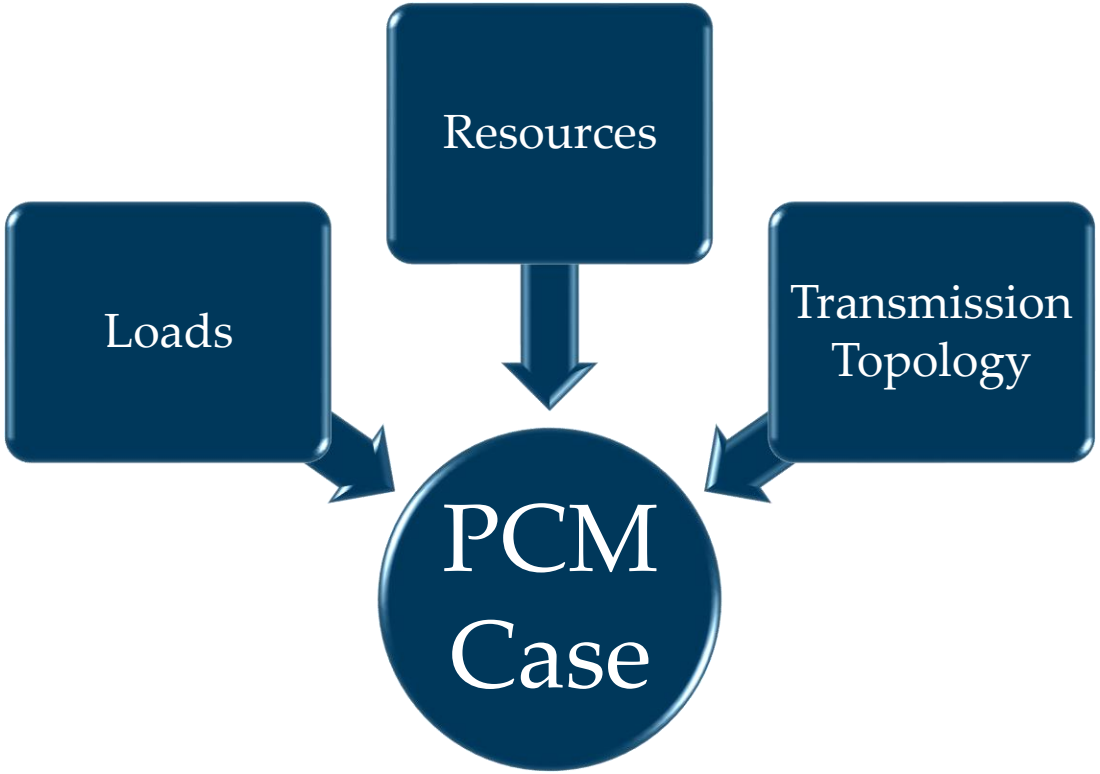
February 15, 2023

Jon Jensen, Tyler Butikofer

ADS Inputs

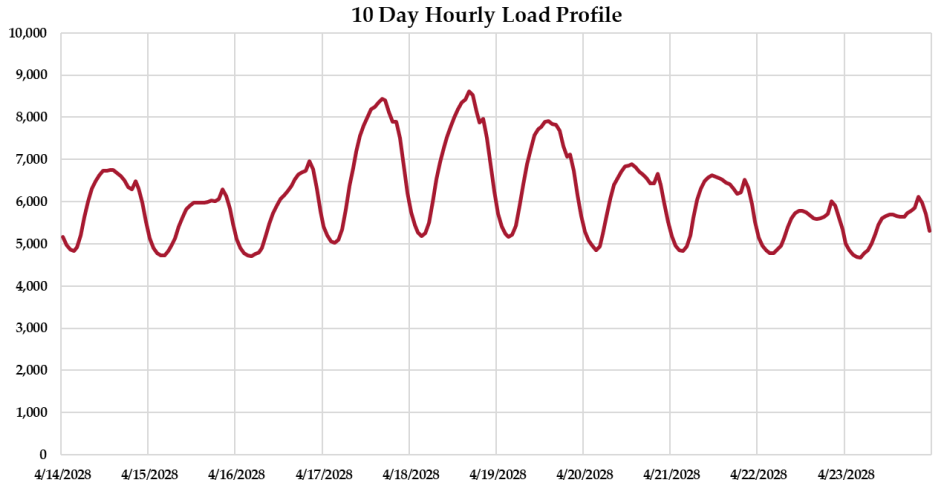
How is the WECC ADS PCM Created?

- Loads—Loads and Resources (L&R) data submittal
- Resources—L&R data submittal
- Transmission Topology—Year 10 heavy summer power flow



ADS Inputs

- Loads
  - Hourly Loads profiles that are created from monthly peak and energy information from 2022 L&R submittal
  - Grown based on an average year (2018) to create the new Year 10 hourly load profiles
  - Input into the PCM as an hourly shape for each area
- Transmission
  - Year 10 PF base case



ADS Inputs

- Generation
  - Location, capacity, status, commission/retirement, etc.—2022 L&R
  - VOM, dispatch cost, startup costs—Intertek report, EIA data, L&R
  - Heat rates—CEMS, Kevin Harris
- Fuel prices (coal, natural gas, other)
  - Coal and natural gas—CEC Integrated Energy Policy Report (IEPR), Moody's GDP Inflator/Deflator series licensed to the CEC
  - Other fuels biomass—Annual Energy Outlook 2022 forecast, NWPCC as available
- Emission prices—CEC 2021 IEPR, Canada planned legislation

ADS Inputs

- Hydro—Given schedule and load following/price
  - PNNL—2018 reference year weekly schedules mostly, some monthly
- Reserves—(Regulation up/down, spinning and non-spinning reserve, load following up/down) PNNL—Work is underway
- Forced outage rates—Generator Availability Dataset (GADS)
- Solar/wind hourly profiles—NREL based on 2018 hourly shapes solar/wind. Locations came from L&R and EIA-869 data
- WECC Path Ratings—WECC Path Rating Catalog

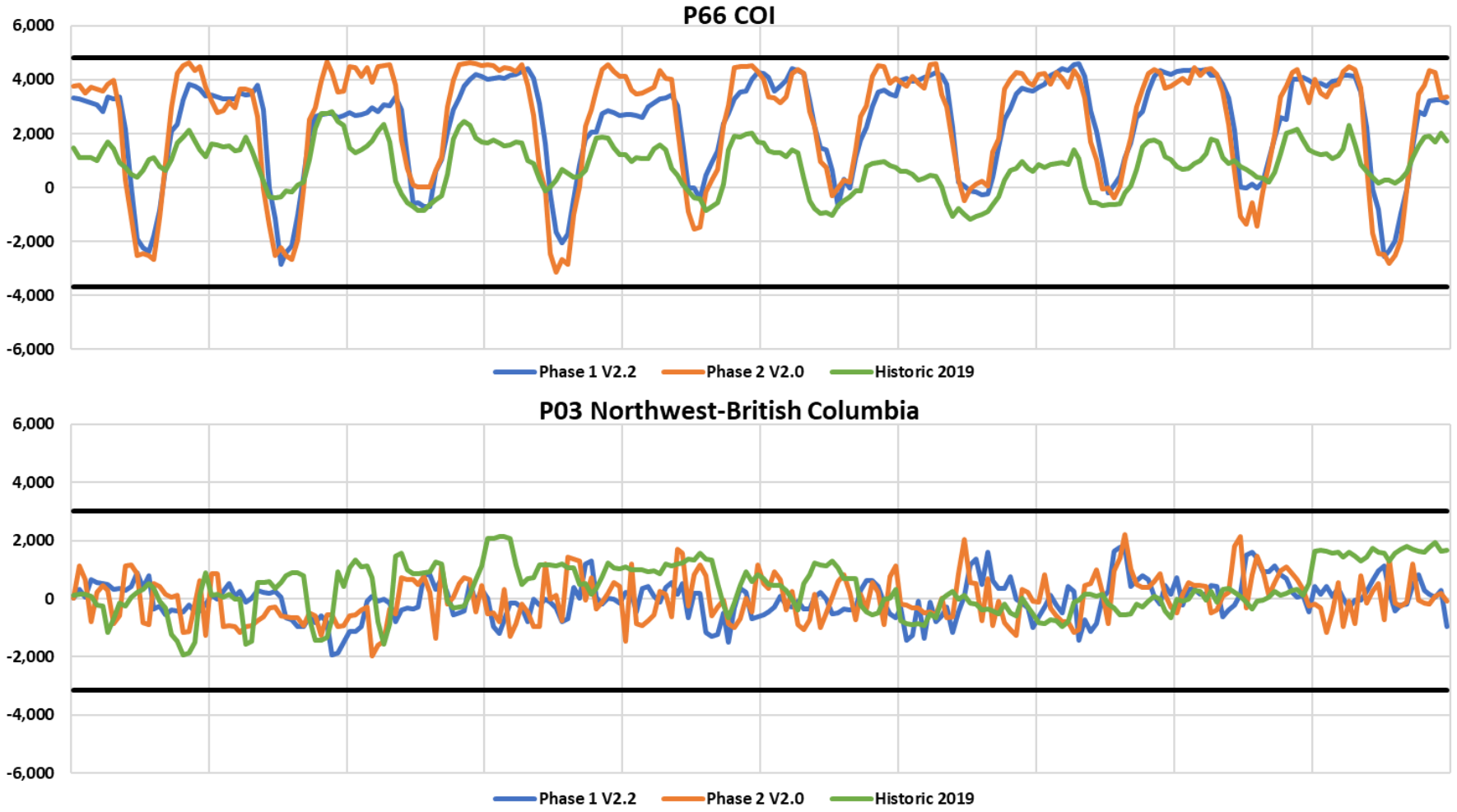
ADS Inputs

- DG-BTM—County profiles were developed for each county in the Western Interconnection. NREL dGen tool, which provided BTM solar shapes to use in the 2032 ADS under funding by DOE.
- DR—Demand Response is modeled as an hourly resource that is fed directly into the model. DR profiles developed by LBNL based off the ADS LMPs.
- Pumping loads—The hourly shapes for pumping plants were modeled with 2018 pump load data collected (CAISO, L&R).
- Maintenance—The actual planned maintenance schedules for each area are proprietary.
  - However, the maintenance schedules for the ADS PCM are developed based on generation and load levels to determine a best estimate for the most cost-effective time to do planned maintenance.
  - Planned maintenance is done weekly.

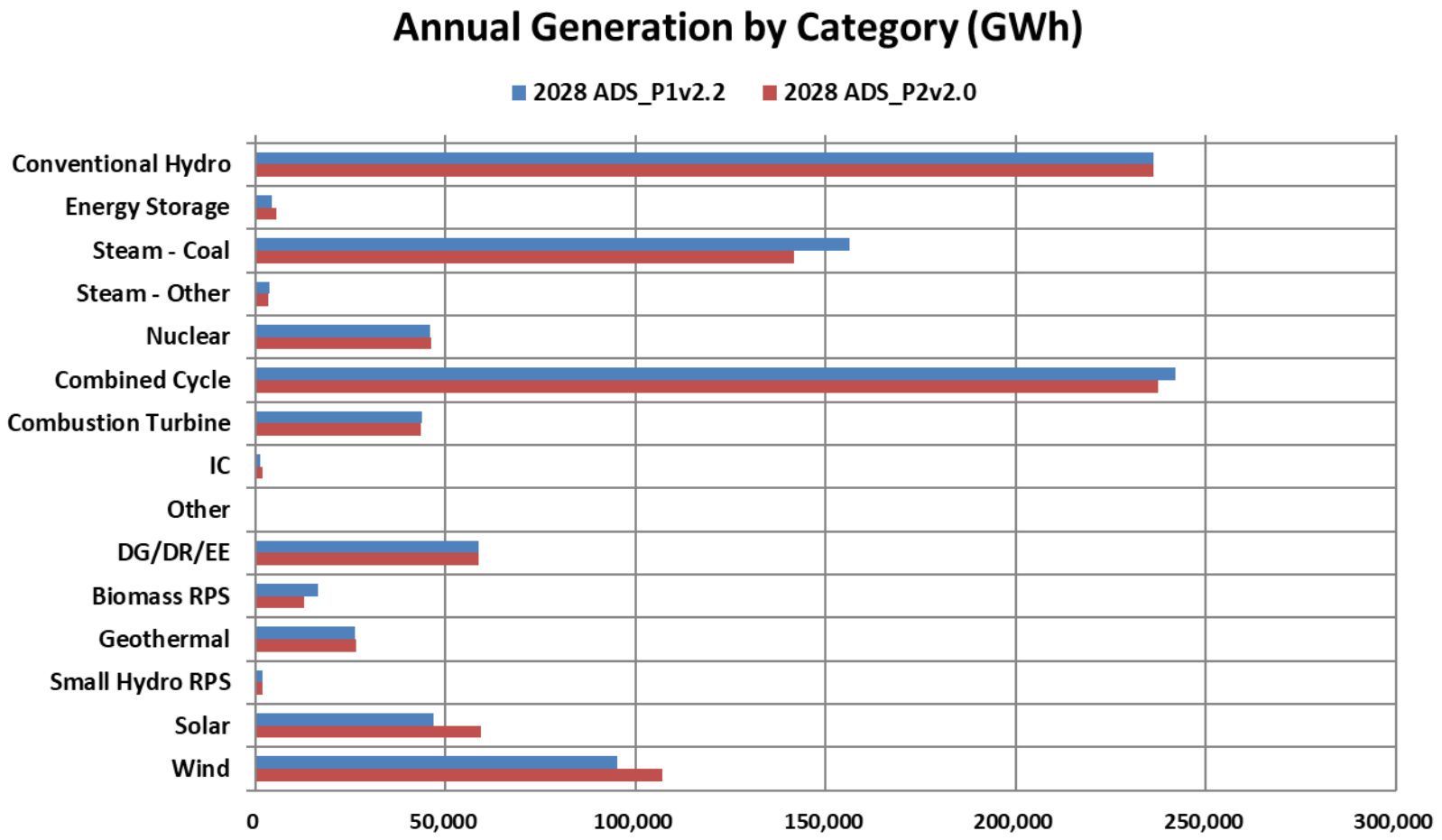
ADS Inputs

- Nomograms/constraints
  - EPE generation will meet 85% or greater of its local load
  - TEP generation will meet 32% or greater of its local load
  - The interaction of Path 8, Montana to Northwest, and Montana hydro generation is modeled. $6,000 penalty
  - Price penalty on imported GHG to California. $25.538 penalty
- Hurdle rates—OASIS wheeling rates ($/MWh) are used in the ADS PCM for each area

How is the PCM Validated?



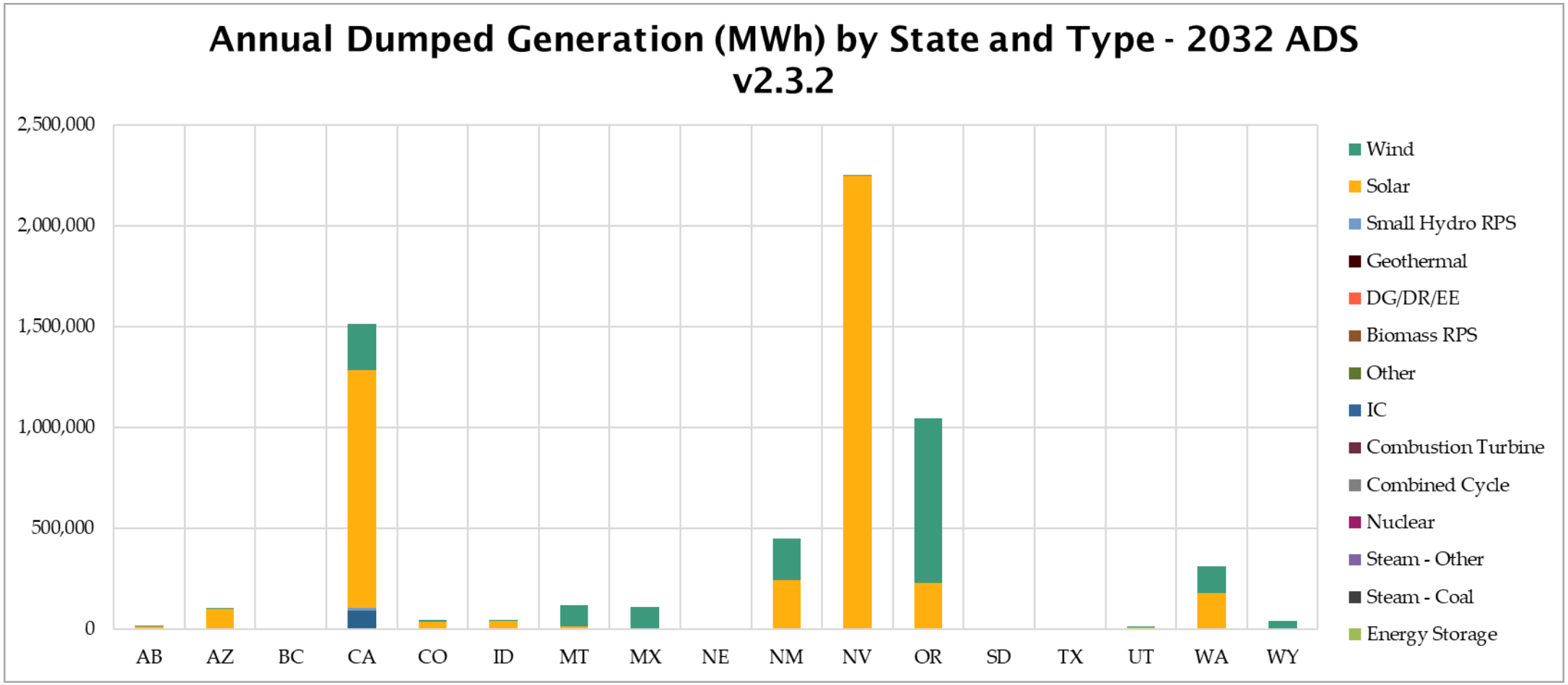
How is the PCM Validated?



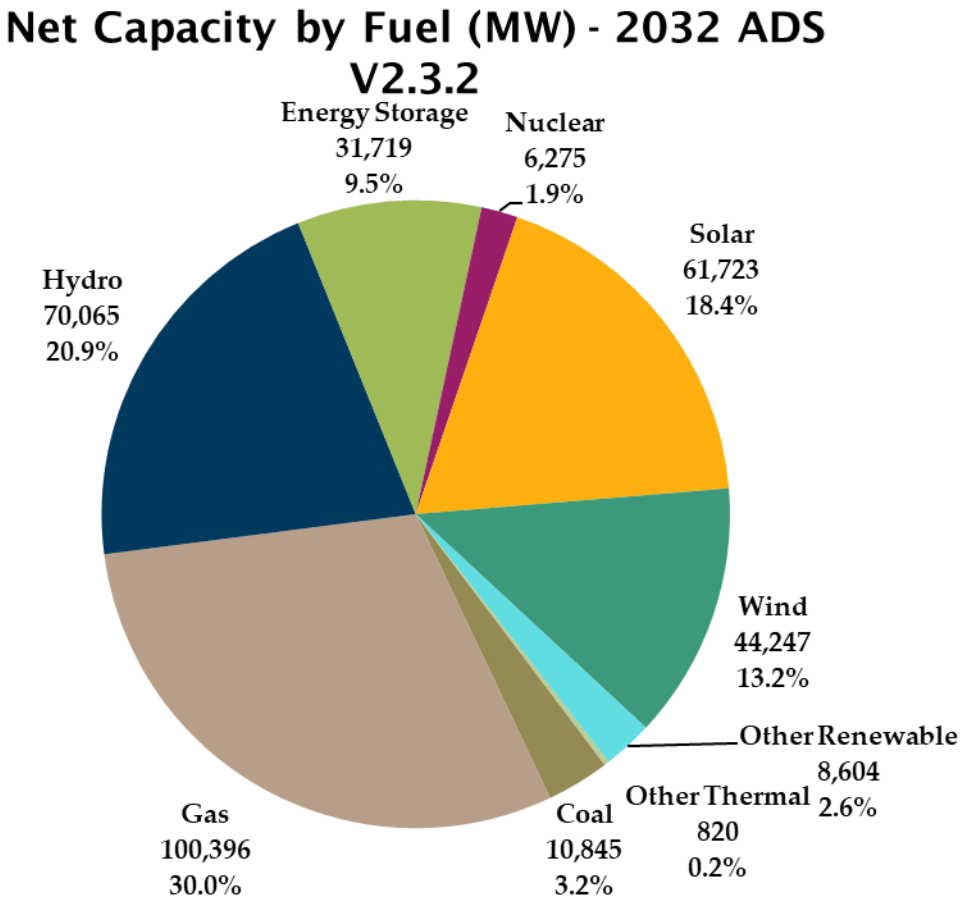
ADS Outputs

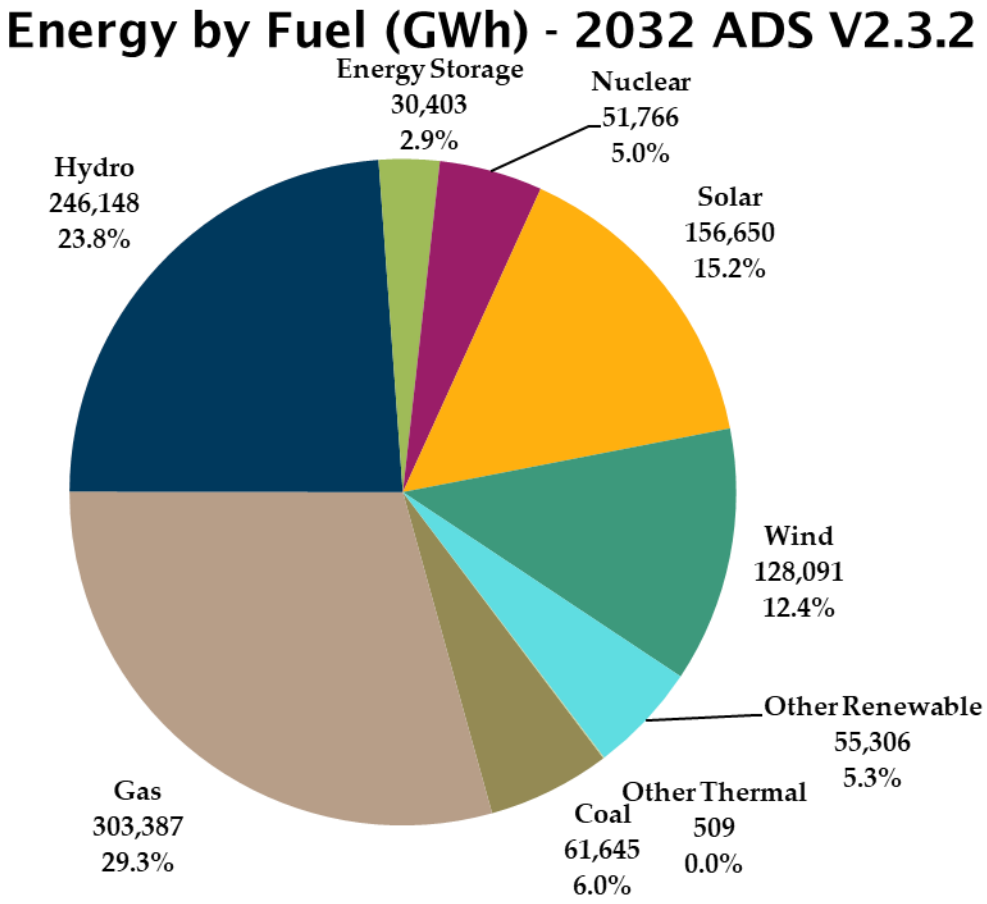
Curtailment and USE

Zero Unserved Energy (USE)

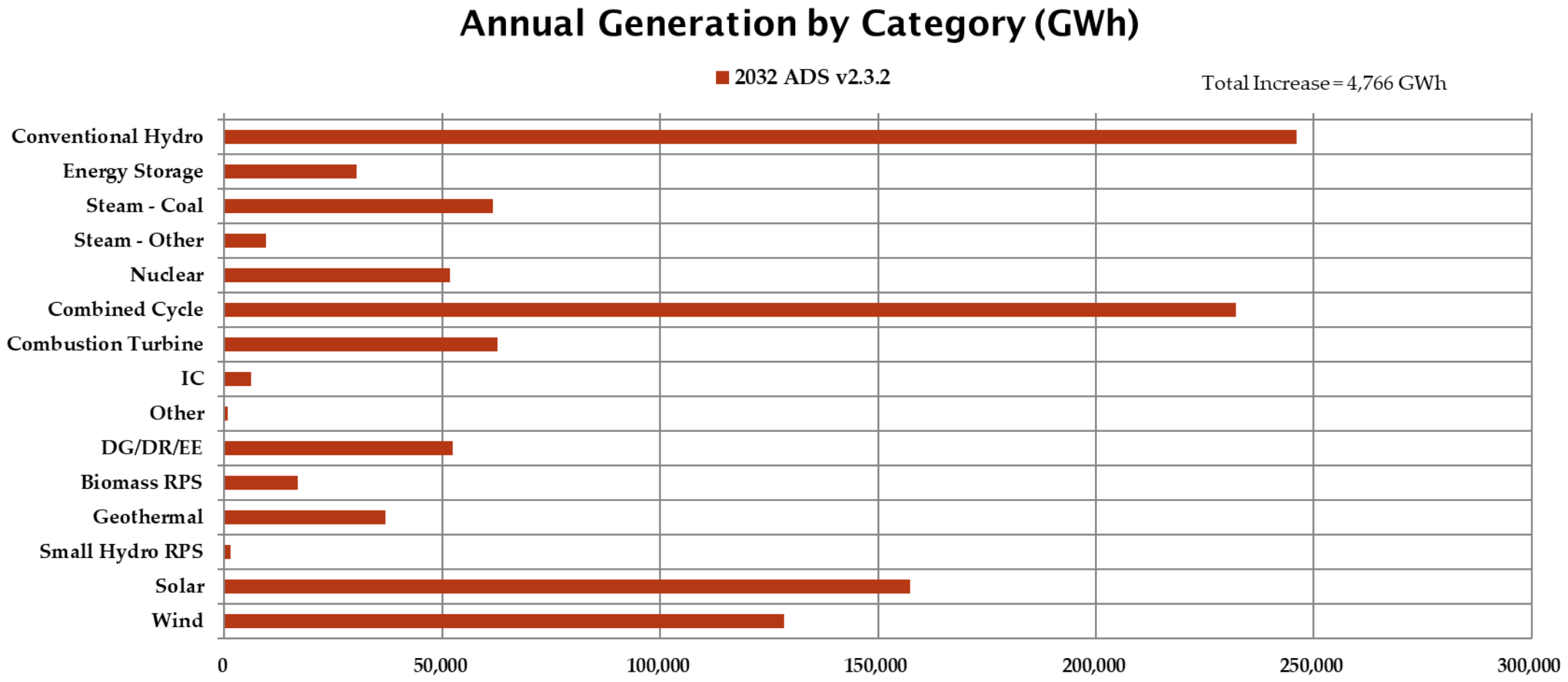


Capacity and Energy

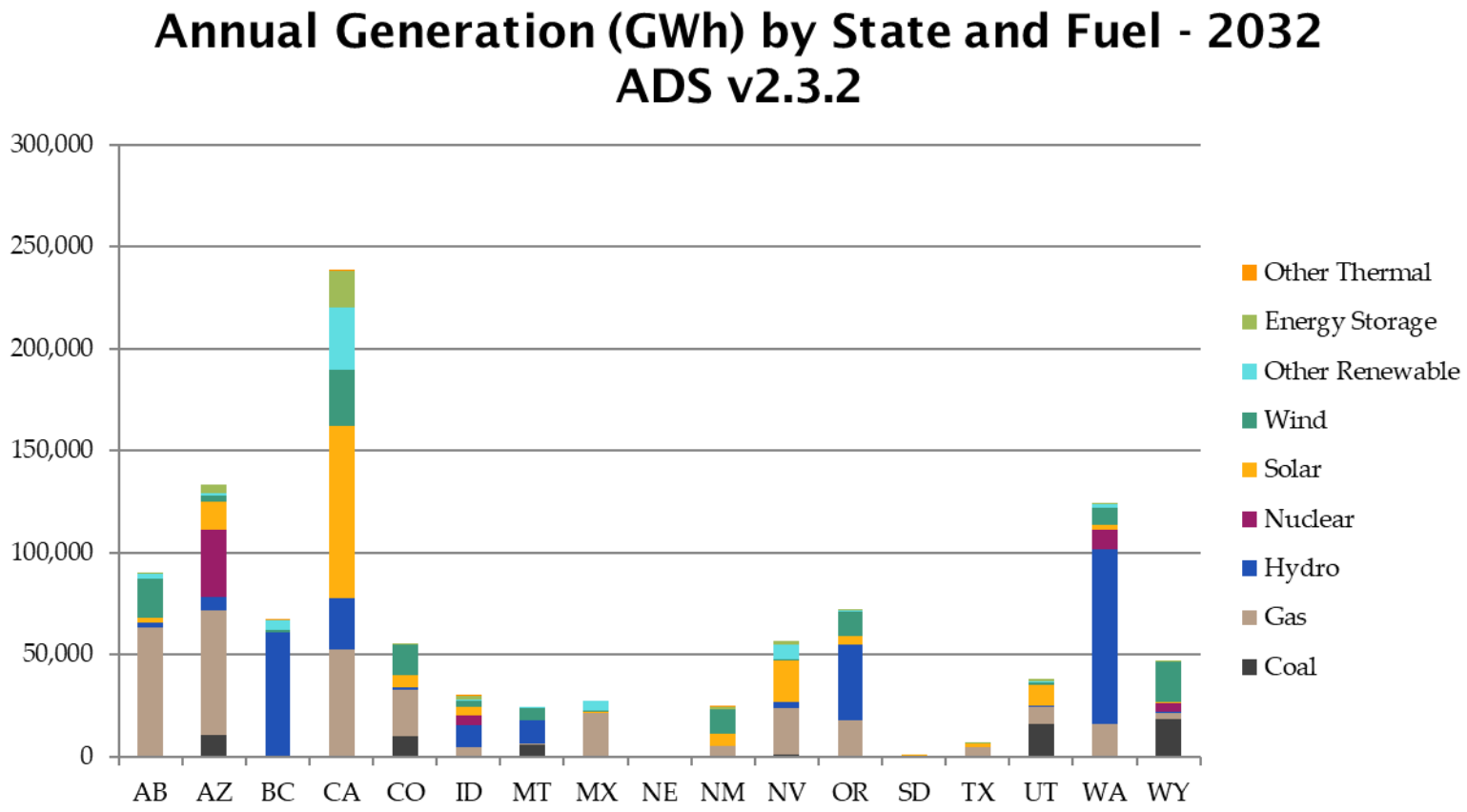




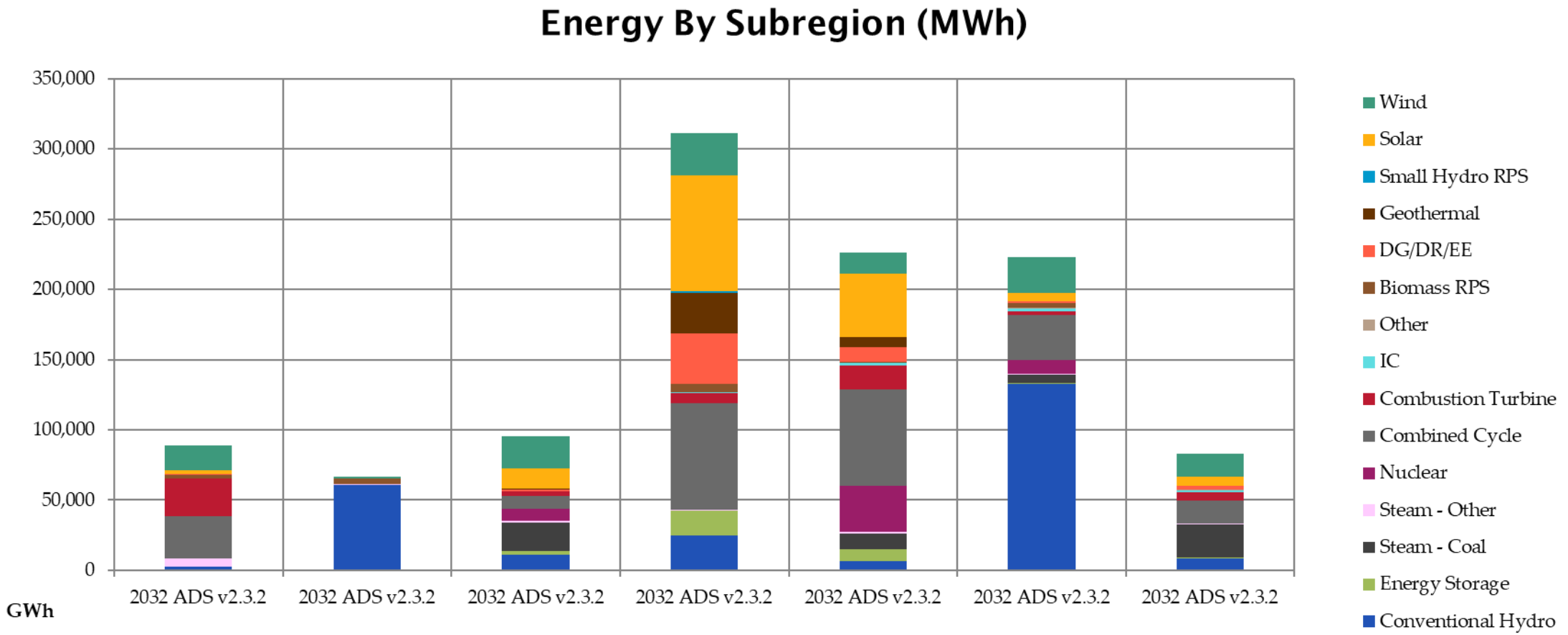
Annual Energy



Annual Energy



Annual Energy



ADS Usage

- Study Program
- Special studies
  - Ex., El Paso Natural Gas Pipeline Disruption
- WECC Scenarios (Year 20)

Resources

- DDVM
- https://www.wecc.org/Reliability/DDVM_2032_ADS_PCM_V1.1.docx

WECC

Electric Reliability and Security for the West

Contact:

Jon Jensen jjensen@wecc.org

Tyler Butikofer tbutikofer@wecc.org