

1. Welcome, Call to Order

Jamie Austin, Production Cost Data Subcommittee (PCDS) Chair, called the meeting to order at 10:34 a.m. on September 21, 2021. A quorum was present to conduct business. A list of attendees is attached as Exhibit A.

2. Review WECC Antitrust Policy

Tyler Butikofer, System Adequacy Planning Engineer, read aloud the WECC Antitrust Policy statement. The meeting agenda included a link to the posted policy.

3. Approve Agenda

Ms. Austin introduced the proposed meeting agenda.

On a motion by Chifong Thomas, the PCDS approved the agenda.

4. Review and Approve Previous Meeting Minutes

Ms. Austin introduced the minutes from the meeting on September 14, 2021.

Approval of September 14, 2021, minutes has been postponed until the next meeting.

5. APFWG Progress Report

Irina Green, California Independent System Operator (CAISO), presented the status of mapping resources in the power flow (PF). It uses a spreadsheet to import data from the production cost model (PCM) into the PF. There is a list of buses from loads and resources (L&R) and PF that do not match. If a bus is not assigned, research needs to be done to locate where it is in the PF and where to place it. The U.S. Energy Information Administration (EIA) numbers are available in the L&R but not in the PF. Previous information is not transferrable. It will help with future research to not change generator names or modify bus numbers from case to case.

Ms. Austin said the task force agreed the PF long name ID (e.g., EIA 860 plant code (6 digits) (gen unit#) should be used to help with mapping L&R. Tracy Rolstad, Power System Consultants (PSC) is a task force member and will take it to the System Review Committee (SRS).

Mr. Butikofer gave an update on the file mapping WECC is working on for other areas. It is 70% complete.

Bharat Vyakarnam, Pacific Northwest National Laboratory (PNNL), presented the comparison generator records of 2030 heavy summer (HS) vs. 2032 HS-1. Areas 20, 21, and 23 are complete for California. Most of the changes found are between the generators. After they are identified they are reviewed to see if they have been removed from the database. This should be complete by the end of this week.

6. Updating Thermal Data

Ms. Austin introduced the topic of thermal data, which would affect the results in the 2032 case. She said trends in thermal plant operation are changing drastically because the new resources are less flexible (variable energy resources wind and solar). Existing thermal resources are more constrained, and their accelerated retirement may lead to increased forced outages.

Intertek first performed the thermal plant cycling study in 2012 and 2020. Within this time the escalation factors were used to adjust the start-up costs and after discussions in 2020, it was shown that numbers cannot just be escalated.

Nikhil Kumar, Intertek Group plc, used this data in 2019 and in early 2020. There are several factors that impact the power plant cycle cost. The major root cause of an increase in capital operations and maintenance cost for many fossil units is unit cycling. Utilities have been forced to cycle aging fossil units. There is an impact of flexible generation on power plants.

Mr. Kumar found that there are not many changes between 2030 and 2032. Adding two years causes very little impact in cycling costs. There are a few updates due to aging affects and retirement horizons. Unit types that are expected to have different operations will need to be identified and updated. There will be a high-level review that will only take a few hours. Mr. Kumar said to leave the numbers the same for 2032 and do not apply inflation to it.

Ms. Austin said there is concern with non-flexible resources (wind and solar) due to a large increase in 2030.

Byron Woertz, System Adequacy Manager, said it might help to look at it while building the 2034 case.

7. Managing Wind, Solar, and BTM-PV Hourly Shapes Development

Mr. Butikofer presented the project plan for developing wind, solar, and behind-the-meter (BTM) photovoltaic (PV) hourly shapes. The National Renewable Energy Laboratory (NREL) is currently testing phase 2018 wind data. The wind generation locations have been provided to



NREL for testing. By the end of the month NREL will test the process for creating wind shapes using 2013 or another validated year's data.

Mr. Butikofer verified that PCDS will be using 2018 data for the 2032 case and NREL is using 2013 for validation purposes. Once the 2021 L&R location and technology are available, the information will be sent to NREL to build profiles using the 2018 data. Locations and technology hub heights will be provided for all wind resources in the 2022 L&R. NREL will rebuild profiles and provide it to WECC. If technology and hub height information is not available NREL will use turbine vintage to provide profiles. PCDS and WECC will validate the information.

Mr. Butikofer will request data with several changing parameters from NREL and will send it to Yi Zhang, CAISO. Mr. Zhang will compare the different profiles to the operation data to validate before moving forward. NREL is checking to see if supplying profiles for every two km square can be done for wind data. The subcommittee discussed using the System Advisor Model (SAM) and creating solar profiles for 100 kV substations and above to obtain a broad overview of the west for study purposes.

NREL does not have hourly data for BTM. They have installed capacity by state instead. The BTM plan will be to proceed as discussed last week. The workplan will be posted to the WECC website and will be reviewed by PCDS next week.

Ms. Austin would like to speak to Greg Brinkman, NREL, to address solar and wind data questions and concerns.

The presentation is posted to the [WECC website](#).

8. ADS Process Guide V3.2 Review

Jon Jensen, System Adequacy Engineer, presented the anchor data set (ADS) process guide, which includes ADS requirements. Mr. Jensen sent it to the PCDS asking for comments and suggestions. The draft will be posted to the WECC website Monday, September 27, 2021. It will be review during the next PCDS meeting along with the data development and validation manual (DDVM) structure draft.

The presentation is posted to the [WECC website](#).

9. Public Comment

No comments were received.



10. Review of Previous and New Action Items

Nicole Lee, Administrative Assistant, reviewed action items carried over from the PCDS meeting on August 14, 2021. Action items that are not closed and will be carried forward can be found [here](#).

11. Review of New Action Items

- Provide typical locations for wind plants in California. Send typical locations and request that Greg Brinkman pull profiles for various parameters (hub height, technology).
 - Assigned To: Yi Zhang, Jamie Austin, Tyler Butikofer
 - Due Date: September 28, 2021

12. Upcoming Meetings

September 28, 2021 Webinar

October 5, 2021 Webinar

October 12, 2021 Webinar

13. Adjourn

Ms. Austin adjourned the meeting without objection at 12:01 p.m.



Exhibit A: Attendance List

Members in Attendance

Jamie Austin..... PacifiCorp
 Michael Granados..... Los Angeles Department of Water and Power
 Kevin Harris..... Harris PCM
 Effat Moussa..... San Diego Gas and Electric
 Chifong Thomas..... Thomas Grid Advisor
 Steven Wallace..... Comprehensive Power Solutions
 Stan Williams..... Bonneville Power Administration—Transmission
 Yi Zhang..... California Independent System Operator

Members not in Attendance

Lee Alter..... Tucson Electric Power
 Hazel Aragon..... California Energy Commission
 Ben Brownlee..... Energy Strategies
 Jose Diaz..... Los Angeles Department of Water and Power
 Christopher Fecke-Stoudt..... Arizona Public Service Company
 Monica Garcia..... El Paso Electric Company
 Manuel Gomez..... El Paso Electric Company
 Chris Hagman..... American Transmission Company
 Bill Hosie..... PSI Power System Innovation Corp.
 Greg Howes..... Colorado Springs Utilities
 Tito Inga-Rojas..... British Columbia Hydro and Power Authority
 Anders Johnson..... Bonneville Power Administration—Transmission
 Harris Lee..... Salt River Project
 Amy Li..... Southern California Edison Company
 John Liang..... Public Utility District No. 1 of Snohomish County
 Peter Mackin..... GridBright, Inc.
 Akhil Mandadi..... Arizona Public Service Company



John D. Martinsen..... Public Utility District No. 1 of Snohomish County
Ahlmahz Negash Tacoma Power
Daniel Ramirez..... Energy Strategies
Dan Schaefer Salt River Project
Sirisha Tanneeru Public Service Company of Colorado (Xcel Energy)
Xiaobo Wang..... California Independent System Operator
Di XiaoSouthern California Edison Company

Others in Attendance

Ryan Afshar..... Los Angeles Department of Water and Power
Tyler ButikoferWECC
Laura Cuagliotti.....WECC
Paul Deaver Public Service Company of Colorado (Xcel Energy)
Greg Fecke Stoudt..... Arizona Public Service Company
Irina Green California Independent System Operator
Jon JensenWECC
Richard Jensen.....WECC
Nikhil Kumar InterteK Group plc
Nicole Lee.....WECC
Hank McIntosh.....San Diego Gas and Electric
Nadar Samaan.....Pacific Northwest National Laboratory
Byron WoertzWECC

