PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Agenda ID: 19463

ENERGY DIVISION **RESOLUTION E-5150**

June 24, 2021

R E S O L U T I O N

Resolution E-5150. Adopts updates to the Avoided Cost Calculator for use in demand-side distributed energy resource cost-effectiveness analyses.

PROPOSED OUTCOME:

- Adopts certain data input updates and minor modeling adjustments for the Avoided Cost Calculator for use in distributed energy resource cost-effectiveness analyses.

SAFETY CONSIDERATIONS:

- None.

ESTIMATED COST:

- No incremental cost. Funds necessary for updates to the Avoided Cost Calculator were authorized in Decision (D.)16-06-007.

Authorized by D.16-06-007, issued on June 15, 2016 and D.19-05-019, issued on May 21, 2019.

SUMMARY

The Avoided Cost Calculator (ACC) is used in cost-effectiveness analysis of distributed energy resource (DER) programs and policies. D.16-06-007 adopted annual updates to the ACC, and D.19-05-019 adopted a schedule for both major and minor changes to the ACC, with minor changes occurring in odd-numbered years by Staff-initiated Resolution.

This Resolution provides the final 2021 ACC and related documentation, consistent with policies adopted in D.16-06-007 and D.19-05-019. The documentation provides additional detail about this update, including a comparison of the 2020 and 2021 ACC outputs. This Resolution describes the data and minor modeling updates to the 2021 ACC.

BACKGROUND

The ACC, first adopted in D.05-04-024,[1] was originally used to measure Energy Efficiency (EE) cost-effectiveness. The assumptions, data, and models used in the ACC require periodic updates to stay current with market conditions, prices, and trends. Thus, semi-regular improvements to the ACC modeling software and data input updates were adopted in decisions from several EE proceedings (e.g., D.06-06-063, D.09-09-047, and D.12-05-015).

D.09-08-026 expanded the use of the ACC beyond EE by modifying and adopting the tool for customer generation (then called distributed generation) programs.

D.10-12-024 modified and adopted the ACC for use by demand response programs and adopted Demand Response Cost-Effectiveness Protocols, which detailed those ACC modifications. The Demand Response Cost-Effectiveness Protocols were subsequently updated in D.15-11-042, including updates to the ACC.

In 2014, the Integrated Distributed Energy Resources (IDER) proceeding (Rulemaking (R.) 14-10-003) opened, with a focus on developing policy to facilitate the use of Distributed Energy Resources (DERs). Among the goals of R.14-10-003 was to establish a unified cost-effectiveness framework that would apply to all DER programs, technologies, and proceedings. The IDER proceeding established a four-phase plan to accomplish this, the first phase of which was to establish one ACC for use in all DER-related proceedings and define a process to regularly update the ACC.

[1] The Commission opened R.04-04-025 to develop avoided costs in a "consistent and coordinated manner across Commission proceedings. D.05-04-024 adopted the report, Methodology and Forecast of Long-Term Avoided Cost(s) for the Evaluation of California Energy Efficiency Programs, and associated spreadsheet models developed by the firm E3 to use in determining the cost-effectiveness of EE programs.

D.16-06-007 authorized annual updates to the ACC, consisting of minor changes, corrections, and data updates, via Resolution drafted by Energy Division staff. Ordering Paragraph (OP) 2 of D.16-06-007 states:

The Commission's Energy Division, no later than May 1st each year, shall draft a Resolution recommending data updates and minor corrections to the avoided costs calculator and, when appropriate the inputs, as described in this decision. Energy Division may issue a draft Resolution updating the Avoided Cost Calculator for 2016 after this Decision is adopted.

D.19-05-019 revised D.16-06-007, authorizing biennial processes for making both major and minor changes to the ACC. Specifically, the Decision modified the schedule set out in D.16-06-007, by authorizing a Resolution adopting minor changes to the ACC to be released for public comment no later than May 1st of every odd-numbered year,[2] as well as establishing a process for making major changes (in addition to minor changes and updates) during even-numbered years.

In 2020, major changes to the ACC focused on creating greater alignment between the ACC, the Integrated Resource Planning (IRP) proceeding (R.16-02-007), and the Distributed Resource Planning proceeding (R.14-08-013) and included the addition of a new avoided cost for high global warming potential (GWP) gases. These major changes were adopted in D.20-04-010.

Energy Division proposed a list of minor updates to IDER stakeholders and held a workshop to discuss those updates in December 2020. A revised list was sent to the R.14-10-003 service list for informal comment. Several stakeholders provided important information about minor errors in the data, modeling, and format of the ACC.

The final list of minor changes to the 2021 ACC focuses on (1) incorporating new data from IRP modeling, (2) fixing minor errors found in the 2020 ACC, and (3) updating all the traditional sources of ACC data such as natural gas price forecasts. The complete list of updates is as follows:

Integrated Energy Policy Report (IEPR)

- Updated to 2020 IEPR Gas Price Forecast
- Incorporated IEPR updates made in IRP, as feasible to meet ACC deadlines

[2] D.19-05-019, p.8.

- Updated "No New DER" case with IEPR updates made in IRP

Gas Transportation Rates

- Updated Gas Transportation Rates from IEPR. The California Energy Commission (CEC) June 2020 Gas Transportation Rate Forecast has removed the double-counting of greenhouse gas (GHG) emissions previously embedded in the natural gas transportation rates.[3]
- Used daily gas prices at Pacific Gas & Electric (PG&E) Citygate and the Southern California Gas Company (SoCalGas) Citygate, and separated gas transportation costs for NP-15/NP-26 (from PG&E Citygate) and SP-15 (SoCalGas Citygate) when calculating historical heat rates. Those historical heat rates are used to calculate the volatility enhancement factors so they indirectly affect forecasts.

Storage Resource Costs

Updated storage costs from IRP, using data from Lazard Levelized Cost of Storage Study 5.0[4], the data source that is used to provide the storage costs used as inputs in the IRP modeling.

Production Simulation

- Incorporated enhancements to IRP and SERVM made in IRP proceeding and updated No New DER scenario based on more recent data inputs, including:
    - Use of data from the final 2019 CEC Integrated Energy Policy Report (IEPR) "Mid Demand - Mid AAEE Case" results[5] and other updates made since the Reference System Plan (RSP) used for the 2020 ACC was produced.[6]
    - Compare wind generation shapes in SERVM to CAISO historical data to better match CAISO observed wind generation.
    - Increase Operating Reserve requirement to 6% from 4.5%, matching recent CAISO recommendations in IRP.
    - Remove 5,000 MW import constraint during peak hours to better match CAISO energy prices.

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[3] Available at: https://www.energy.ca.gov/sites/default/files/2020-06/June_2020_Model_CEC-200-2014-008_ADA.xlsm

[4] Available at: https://www.lazard.com/perspective/lcoe2019

[5] AAEE = Advanced Achievable Energy Efficiency. See 19-IEPR-02 Electricity Resource Plans at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=19-IEPR-02 and 19-IEPR-03 Electricity and Natural Gas Demand Forecast at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=19-IEPR-03

[6] No New DER scenario output available at: https://www.cpuc.ca.gov/General.aspx?id=6442459770

  - Base market price on marginal dispatch cost including operating reserves in each hour, instead of total cost of the marginal electric generator in each hour. Results indicate this approach is a better match with CAISO historical prices.
  - Update the baseline generation fleet with new additions identified in updated CAISO Master Generating Capability Lists since the development of the RSP in 2019, as well as any planned development or online resources identified by LSEs in their September 2020 IRP filings.
  - Produce price and dispatch reports for a single iteration, not average iterations as was done in the 2020 ACC update.
  - IRP has run new RESOLVE cases[7] that form the basis for the NoNewDER case used for the ACC. RESOLVE outputs provide updated GHG values, and SERVM outputs provide updated energy and ancillary services prices, as well as implied heat rates.
- Investigate errors to make minor improvements in scarcity pricing adjustment. Evaluation should incorporate results from hourly price shape benchmarking, and compare original method to 24-hourly algorithm proposed by Joint IOUs in 2020.
- IRP has provided SERVM outputs, which were used to benchmark energy prices to provide stakeholders opportunity to review.[8]

Transmission and Distribution

- Made minor adjustment for PG&E: set PG&E's secondary distribution system (voltage level < 4kV) marginal capacity costs input to zero, because secondary capacity costs are not time-differentiated costs and therefore not applicable to ACC.

Note: New more detailed GNA and DDOR filings with upgrades down to line sections (rather than just to the feeder) will be submitted by IOUs in Fall 2021. Propose no update in 2021 and focusing on incorporating latest GNA and DDOR filings in 2022.

High GWP and Methane Leakage

Note: The refrigerant database will not be updated, as previously stated, as California Air Resources Board (CARB) reports they have suspended updates

[7] available at https://www.cpuc.ca.gov/General.aspx?id=6442466555
[8] available at https://www.cpuc.ca.gov/general.aspx?id=5267

pending a new study. An updated refrigerant database should be available for the 2022 Avoided Cost Calculator update.

Minor Bug Fixes

- GHG forecast is one year off in gas model and was adjusted.
- Distribution Tab: $AQ value changed to $AS so that it updates properly as the selection of utility and climate zone change.
- IRP team reports that they have fixed error that caused SERVM to not include hourly prices for Regulation and Spin Reserves in the overall market price.
- Fix minor errors on DR Output Tab
    - Fixed incorrect cell references.
    - Fixed cell F7. (Changing the start year in this cell wasn't affecting any of the results and the cells with values were not coded to lookup the year.)
    - On peak losses in cells I21 to K23 were not calculated correctly and were corrected.
    - Made changes to ensure that DR Output Tab syncs with DR Reporting Template, including formulas and format.

The update of the ACC was completed by Energy and Environmental Economics, Inc. (E3) under direction from Energy Division staff. E3 issued a draft ACC spreadsheet and documentation that details the proposed set of changes to the ACC. Energy Division staff posted these files to the CPUC's Public Documents Area website, as described in Appendix A.

According to D.16-06-007, Conclusion of Law 2, all DER proceedings are required to use the ACC adopted in the IDER proceeding (R.14-10-003) when performing cost-effectiveness analyses of DER programs. Hence, any direction or guidance provided by this Resolution supersedes any contradictory provisions of previously discussed decisions, resolutions, or other documents adopted by the Commission, such as the Demand Response Cost-Effectiveness Protocols.

DISCUSSION

The Commission has reviewed the ACC updates made by E3 under direction from Energy Division staff and find that the proposed ACC updates are within the scope ordered by D.16-06-007, D.19-05-019, and D.20-04-010. The ACC updates are found to be necessary to more accurately reflect Commission policies and priorities related to resource planning, as well as to better reflect market

conditions, trends, and prices. We have determined that it is reasonable to adopt these changes.

COMMENTS

Public Utilities Code Section 311(g)(1) provides that this resolution must be served on all parties and subject to at least 30 days public review and comment prior to a vote of the Commission. Section 311(g)(2) provides that this 30-day period may be reduced or waived upon the stipulation of all parties in the proceeding. The comment period for this resolution was neither waived nor reduced.

FINDINGS

1. D.20-04-010 directs Commission staff to update the Avoided Cost Calculator annually.
2. D.20-04-010 OP 7 directs Commission staff to make minor changes to the Avoided Cost Calculator, as specified in that Decision, during odd-numbered years.
3. D.19-05-019 OP 11 directs Commission staff to make corrections, data updates, and minor changes.
4. The updates to the Avoided Cost Calculator, as described by Energy and Environmental Economics, Inc. in its Avoided Cost Calculator spreadsheet and documentation, are reasonable for use in DER cost-effectiveness. It is reasonable to adopt this 2021 Avoided Cost Calculator, specifically referred to as ACC_2021_v1a.

THEREFORE IT IS ORDERED THAT:

1. The updates to the Avoided Cost Calculator, as specified herein and further enumerated in documents made available through Appendix A of this Resolution, are adopted for use in demand-side distributed energy resource cost-effectiveness analyses.

This Resolution is effective today.

I certify that the foregoing resolution was duly introduced, passed, and adopted at a conference of the Public Utilities Commission of the State of California held on June 24, 2021; the following Commissioners voting favorably thereon:

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Rachel Peterson
Executive Director

Appendix A

Avoided Cost Calculator 2021 Update documents are available online.

2021 Avoided Cost Calculator ACC_2021_v1a, the 2021 Natural Gas Avoided Cost Calculator, the Avoided Cost Calculator 2021 Documentation, and related data files are all available for download on this site: https://www.cpuc.ca.gov/General.aspx?id=5267 (scroll down to Avoided Cost Calculator section).

As a backup, these documents are also temporarily available here: https://www.ethree.com/cpuc-acc-downloads-page/.