Resource Counting: Hybrid

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PG&E

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D.22-06-050 Direction

- Recent RA Reform decision directed further development of existing hybrid / co-located methodology for 24-hour framework.

- Identified that further discussion is needed to address different hybrid configurations, ITC charging assumptions, and partial deliverability.

Hybrid Background (CPUC)

CPUC Definitions

- D.20-06-031: established existing hybrid rules*

- <u>Primary distinction in the rules: whether there are ITC charging restrictions (projects that must charge from the renewable component for tax purposes)</u>

  - Resources (either hybrid or co-located) <u>without</u> charging restrictions are treated as separate resources for resource counting purposes, subject to interconnection limits

  - Resources (either hybrid or co-located) <u>with</u> charging restrictions are subject to rules established in D.20-06-031

    - Resources with charging restrictions are the subject of these proposed changes

*A CEERT proposal in 2021 to update the methodology to use the DC rating of the solar array to calculate the capacity of the solar component was not adopted due to lack of readily available data to distinguish whether a system is DC or AC coupled.

Hybrid Background (CPUC)

CPUC Decision Language (D.20–06–031):

- Total QC = Effective ES QC + Effective Renewable QC

- Effective ES QC equals the minimum of:

  (1) The energy (MWh) production from the renewable resource from 2 hours after the net load peak until 2 hours before the net load peak assuming charging is done at a rate less than or equal to the energy storage's capacity. This renewable charging energy is then divided by 4 hours to determine the QC; or

  (2) The QC of the energy storage device.

- Effective Renewable QC equals the remaining renewable capacity, net of the capacity required to charge the battery at a constant rate over the available charging hours, multiplied by the ELCC factor for the month.
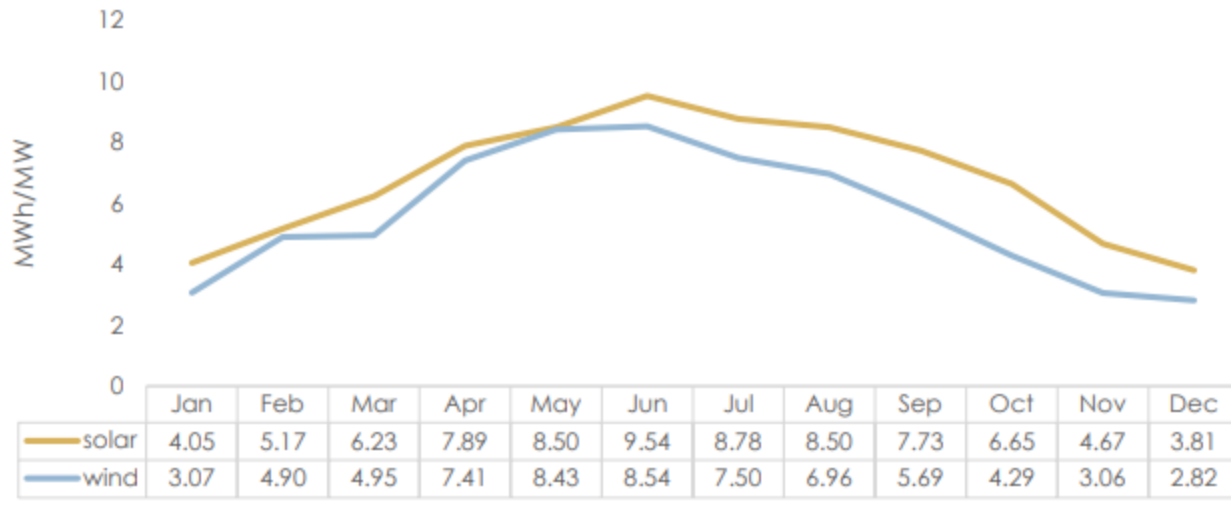
Existing CPUC Hybrid Process

D.20-06-031 Rules for Resources with Charging Restrictions*

1. ED creates a monthly energy profile:
   - Determine projected peak net load hour based on the CAISO flexible capacity study.
   - Determine daily production profiles for solar and wind by month:

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
solar	4.05	5.17	6.23	7.89	8.50	9.54	8.78	8.50	7.73	6.65	4.67	3.81
wind	3.07	4.90	4.95	7.41	8.43	8.54	7.50	6.96	5.69	4.29	3.06	2.82

2. Determine if sufficient renewables exist to fully charge storage component in all months:
   - Take the difference between the nameplate and the capacity needed to charge the battery per the profile above.
3. ELCC is applied to any remaining production after removing capacity required for charging (difference of nameplate and capacity needed to charge the battery).
4. Total capacity is capped at the point of interconnection limit.

*Assume the battery charges entirely from the renewable generator (i.e. it doesn't address 75-99% renewable charging).

Example

Relative Size of the Hybrid Components Matter:

- Example in 2:1 scenario below shows a 100 MW solar resource and 50 MW battery
- Example in 1:1 scenario below shows a 100 MW solar resource and 100 MW battery
- Per the previous graph
  - Sept: 7.73 MWhs/MW daily → 773 MWhs of energy for 100 MW solar resource
  - Dec: 3.81 MWhs/ MW daily → 381 MWhs of energy for a 100 MW solar resource
- September has sufficient charging capacity for either a 2:1 or 1:1 configuration
- December does not → it falls short in December under a 1:1 configuration
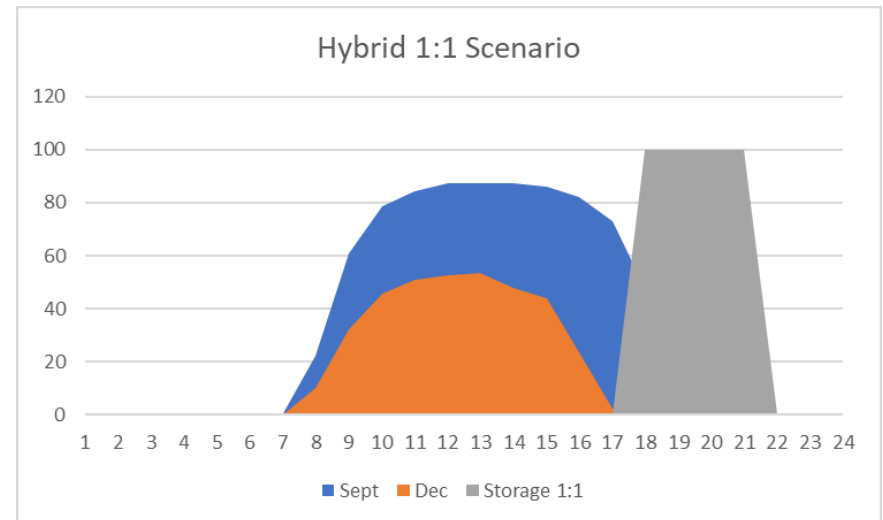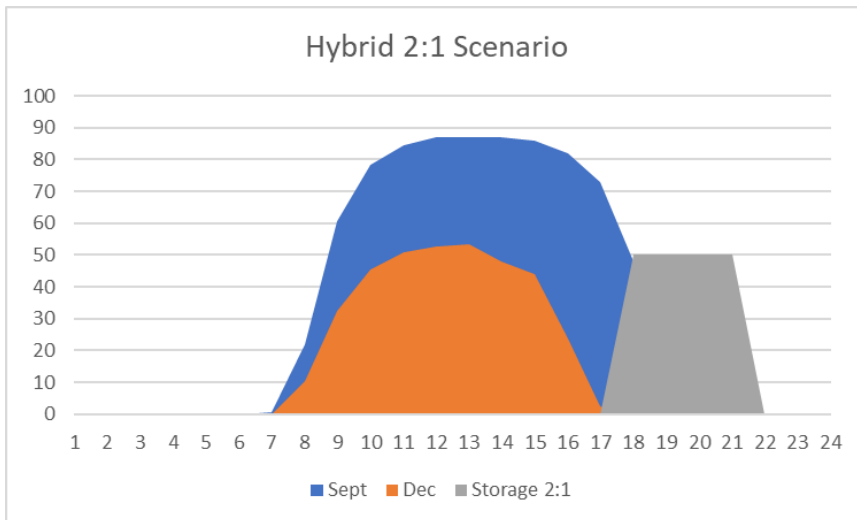
PG&E Proposal: Hybrid

PG&E Proposal for Resources with Charging Restrictions

Keep existing rules and methodology with the following changes:
- Profile used to determine if sufficient charging capacity exists uses new counting rule treatment
- Methodology used to determine sufficient charging capacity accounts for charging losses
- Methodology used to determine sufficient charging capacity accounts for all renewable capacity that can be used for charging, even if all of it isn't deliverable
  - Need Master Resource Database to capture DC rating
- Excess charging capacity receives new counting rule treatment

Other Elements

- Resources without charging restrictions receive counting methodology of the standalone resource types (e.g. solar, storage)

  - Storage portion of these resources need to demonstrate charging capacity from other resources in other hours, just like all other storage resources

- Showing methodology needs to cap storage portion of hybrid resources with charging restrictions at the renewable charging capacity in each month (adjusted for losses)

  - I.e., a hybrid resource might have sufficient charging capacity in some months, but not all due to the different solar output levels across months

Key Issues / Questions

- <u>Deliverability</u>: D.22-06-050 (appendix A) stated:
    - "Resources must be deliverable to qualify to sell RA (and be included in the RA showing), as required today. Resources that are partially deliverable can only provide RA for the portion of the resource that is deliverable."
    - Implications for master resource database:
        - Hybrid / co-located resources need to be identified as such to appropriately treat the non-deliverable resource (i.e. as a charging source for a deliverable resource)

- <u>Partial Grid Charging</u>
    - The current methodology assumes that 100% of the resource charges from the renewables, however, resources can still be eligible for the ITC if they charge up to 25% from the grid
    - <u>Question for the industry</u>: How critical is it that we address these scenarios?
    - If it's important:
        - Is the charging percentage an annual metric? i.e. can you charge from the grid more than 25% of the time in December, but on an annual basis still be below the 25% threshold?

- <u>Inflation Reduction Act</u>: if this is passed and ITC can be applied to standalone storage, effectively eliminating charging restrictions, how many projects will still be subject to these rules?