Challenge for renewables

Oversupply and ramping: A challenge as more renewables are integrated into the grid
• New Joint Appendix outlines the minimum qualification requirements for residential compliance credit
  – All batteries must be certified to CEC as meeting these requirements to get compliance credit

• Minimum Performance Requirements
  – Minimum usable capacity of 5 kWh
  – Round-trip efficiency of at least 80 percent (with more credit for better performers)
  – Energy capacity retention of 70 percent after 4,000 cycles or 70 percent under a 10-year warranty
• General Control Requirements
  – Programmed to first meet the load of the dwelling
  – Capable of being remotely programmed to change the charge and discharge periods
  – Twice a year, perform a system check to ensure the battery is not left in backup mode
At time of inspection, the battery shall use one of the following control strategies, and may be able to switch to others:

- **Basic Control Strategy**
  - Charge when generation is greater than load
  - Discharge when PV production is less than the dwelling load

- **Time-of-Use Control Strategy**
  - Charge when generation is greater than load (same as Basic Control)
  - Discharge to dwelling and/or grid only during peak TOU hours
• Advanced Demand Response Control Strategy
  – Programmed as Basic or TOU Control, plus
  – The battery can change the charge and discharge periods based on a signal from a utility provider or aggregator

• CEC’s Executive Director may approve additional control strategies, if there’s a proven, beneficial strategy that doesn’t fall into one of the above.
The Invisible House - PV Plus Basic Battery – A “Mild” Summer Day

“Annual” netting assumes all hours of the day/year have the same emission and energy cost values, not a correct assumption.

- **Blue line** smooths out the belly of the duck and achieves zero carbon and zero energy without resorting to netting.
At Inspection

- Inspector is only looking for three things:
  1. Are the forms there?
  2. Is the battery there?
  3. Is it starting in the right control mode?

- Inspectors are NOT asked to get on roofs, check electrical connections, etc. Straightforward visual inspection only.

- Trust your gut; dig deeper if it seems off
Looking towards 2022

- Incorporate any lessons learned from 2019 requirements
  - Updates to control strategies?
  - Maximum system sizes?
  - Discuss battery technologies?

- Add appendix for thermal storage (JA13)

- Find ways to apply similar ideas to nonresidential buildings
  - Specifications for microgrids?
  - More consideration of battery-only systems?
Questions?