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Key points from the CA DR Potential Study Phase 3: The Potential for Shift Demand Response

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2019 IEPR Joint Agency Workshop on Buildings Policy: Energy Efficiency, Decarbonization and Load Flexibility

August 27, 2019
The future is now for the duck curve
The case for Shift demand response in California

WHY do we need Shift?
- To alleviate curtailment of renewables.
  - Curtailment in May 2019 alone represents ~$11M in value.*
- To ease ramping rates and flatten demand peaks.
  - Day-ahead prices spiked to near $1000/MWh at times in 2018.**

WHEN do we need Shift?
- Shift can potentially ease ramping rates every day.
- Typical need is to shift away from evening or morning peaks & toward mid-day or overnight.
  - Typically two opportunities to shift each day—sunrise and sunset.

Source: CAISO
Modeling a supply curve for Shift DR in 2030
Shift resource by sector and end use

Battery threshold
Reference
price

Available Shift resource (GWh-yr)
Levelized cost ($/kWh-yr)

End use
- Pool pumps
- Space cooling
- EV level 1
- EV level 2
- HVAC
- Refrigeration
- Process
- Pumping

Sector
- Industrial
- Commercial
- Residential
Shift resource by utility, building type, and end use
For technologies that are less expensive than batteries

Limited res. potential in baseline scenario
The importance of costs and customer participation rates

Technology costs and performance levels constrain how much of the technical potential can be made accessible. Bringing down costs can increase the available resource.

Analysis includes a customer participation model based on historical participation rates, which sharply limits residential participation. New customer engagement models may help.
Imagining a transformed market for Shift Electrification, lower costs, and higher participation

- Electrification scenario: Heat pump space and water heating reach ~30% penetration by 2030, on the way to meeting California’s carbon neutrality mandate.

- We also modeled a market-transformation scenario with large (3x-10x) reductions in cost and increases in customer participation.

- Dramatic increases in the available Shift resource are possible, especially for new electrification loads.
Pathways to Shift as a resource
Diverse pilot options to try soon

- CPUC’s Load Shift Working Group Identified 6 new pilot concepts with diverse levels of market integration, granularity, organizational roles & customer class targets.
- Data from pilots would provide essential new data to chart a course for Shift through modeling and program development.

Read more at: https://gridworks.org/initiatives/initiatives-archive/load-shift-working-group/