# CPUC/PG&E Meeting

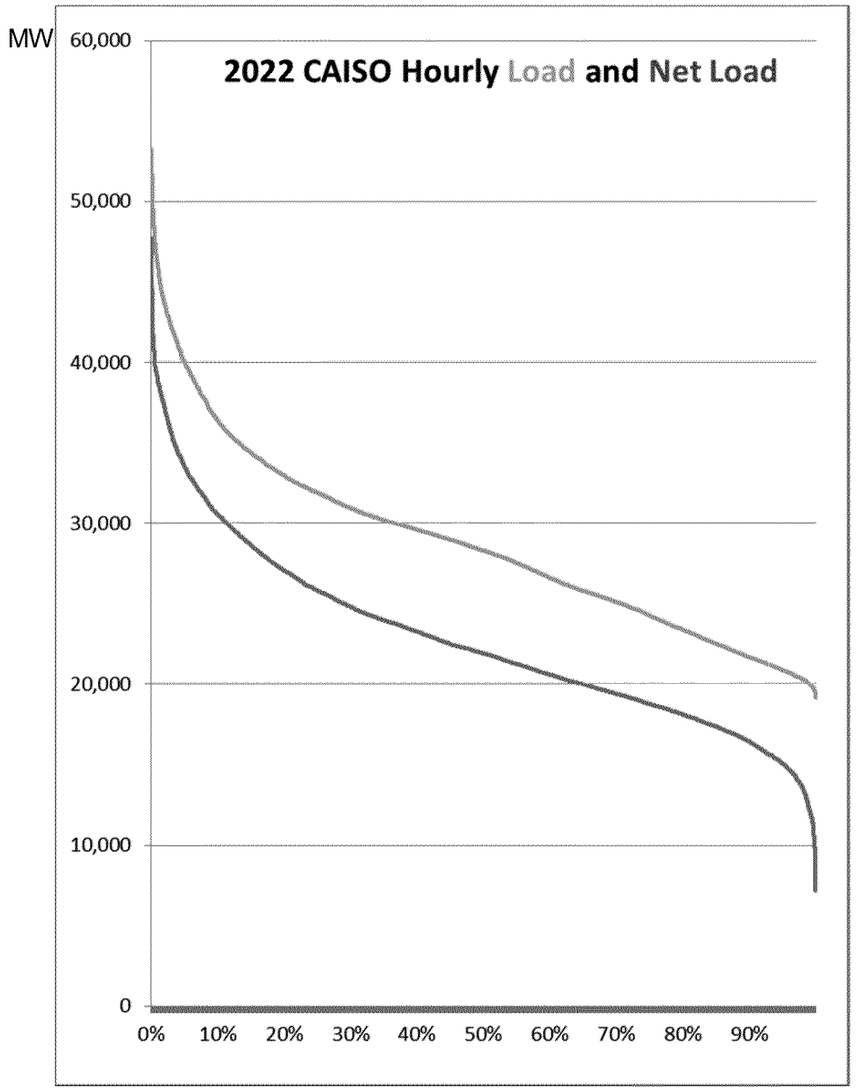
# Demand Response

December 11, 2013

# Agenda

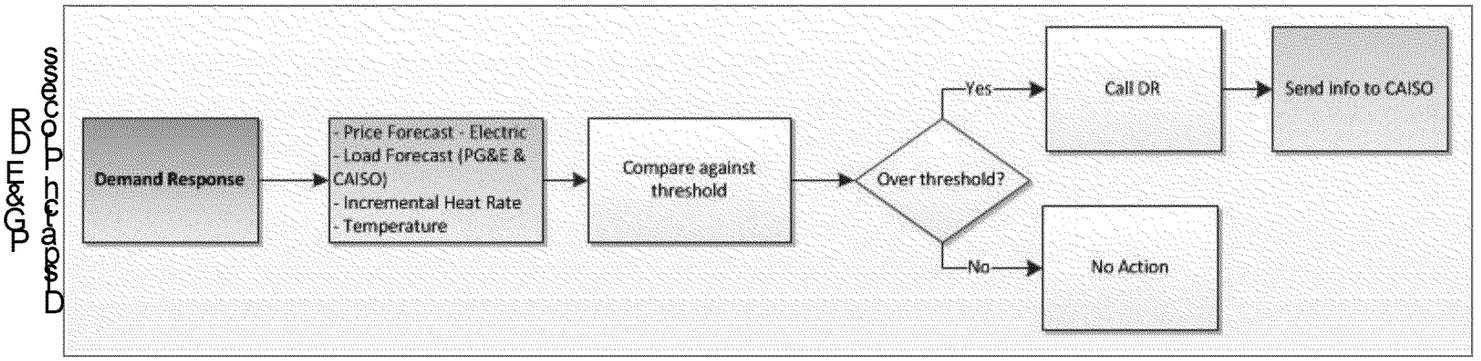
- Introduction / Objectives
- Why current DR programs are normally dispatched after gas turbines
- How demand side resources can help with the "Duck curve"
- Our experience with bidding DR into the CAISO markets and what we've learned that could allow better DR integration with the CAISO
- Summary and Next Steps

# The CAISO's "load duration curve" tells us that DR programs even with limited hours of operations are valuable




- Current DR programs are designed to meet the extreme needs of the electric resource portfolio
- Load duration curve (LDC) presents the 2022 CAISO hourly load and net load sorted from high to low
- Interesting observations:
  - Load is reduced by 5,800 MW over the top 50 hours of the year
  - Net Load is reduced by 7,900 MW over the top 50 hours of the year.

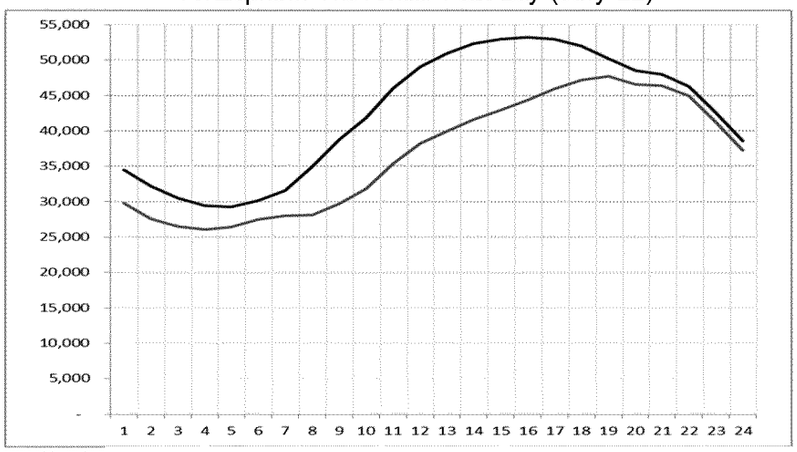
- PG&E's DR program and rate triggers are tailored to dispatch DR resources in line with program design:
  - Heat rate, high energy prices, or high system load triggers, for DR programs that target peak hours
  - Emergency alerts and warnings as defined by the ISO, for reliability/ emergency programs
  - Temperature triggers, for 'critical peak pricing' rates that are dispatched relatively frequently (9-15 times per year)
- PG&E dispatched DR during all 10 of the highest gross load hours during Summer 2013



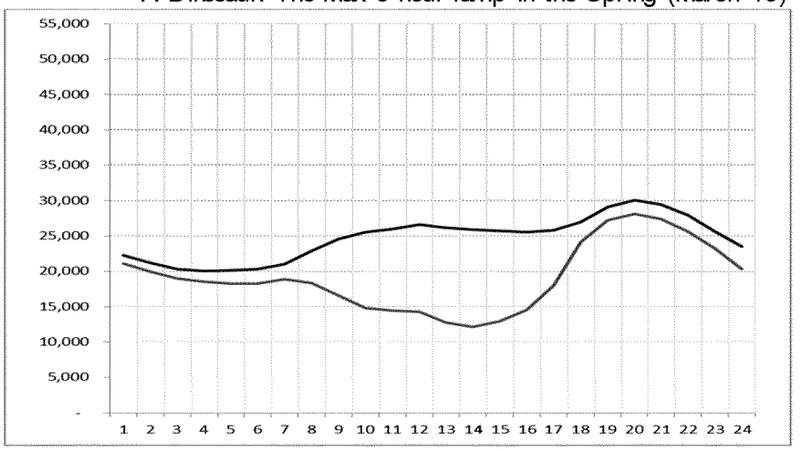
# How DSM can help with the "duck curve" – Part 1

- Not all days look like a duck; only spring and winter days
- Summer days look more like an elephant and require more capacity than "duck" days
- Dispatchable DR capacity is most effective in meeting needle summer day peaks

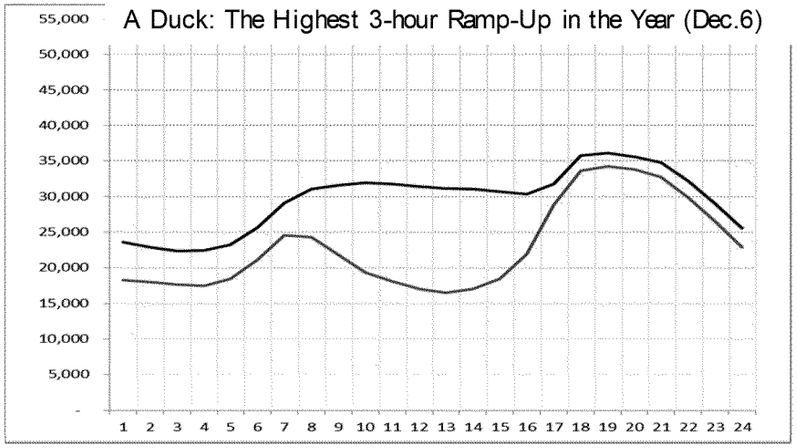
An Elephant: The Annual Peak Day (July 22)



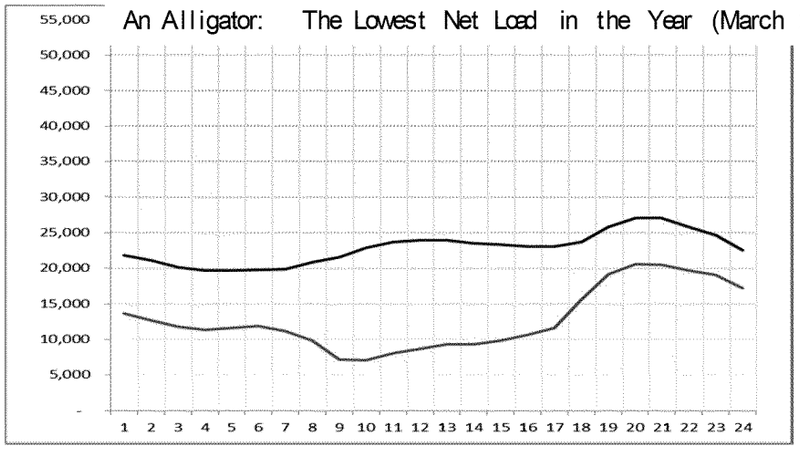

A Dinosaur: The Max 3-hour ramp in the Spring (March 13)




A Duck: The Highest 3-hour Ramp-Up in the Year (Dec.6)

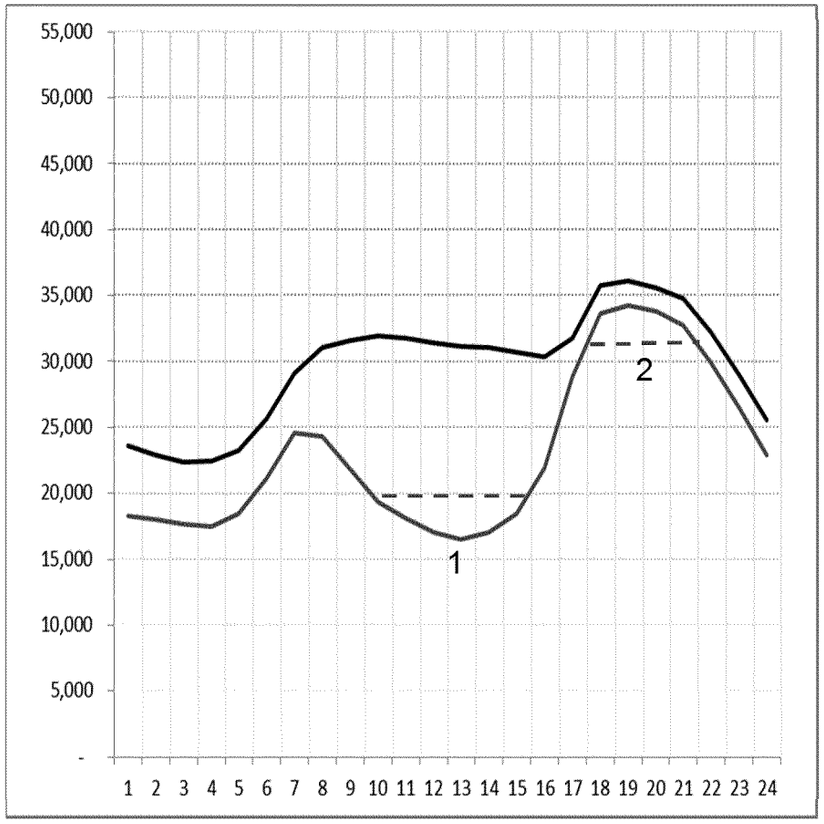



An Alligator: The Lowest Net Load in the Year (March 26)



# How DSM can help with the "duck curve" – Part 2

A Duck: The Highest 3-hour Ramp-Up in the Year (Dec.6)




Even in spring and winter "duck-like days", DSM can help:

1. Increasing consumption in the middle of the day, or when there is surplus and potential overgen (reducing the belly of the duck), or
2. Reducing the neck of the duck (the peak), or
3. 1) + 2).
4. DSM including DR, EE, PLS, Rates, DG, EVs, etc. can change the load shape and thus the "duck"
5. PG&E is conducting studies to better characterize non-summer load opportunities

## PG&E bidding experience (PDR and PL) and other ISOs approaches

- PG&E has the most direct experience
  - Bid PDR in 2011 and 2012 via the PeakChoice program.
    - It was ended due to low cost effectiveness results
  - A/S pilots in 2009 and 2011
    - 2009 was as PL providing non-spin
    - 2011 was testing customers providing regulation
  - IRM2 in 2014 as PDR providing energy services
    - Studying how DR can assist with renewable integration
    - Testing direct participation

- Recent visits to PJM, NYISO and ISO-NE confirm that the way they incorporate DR is generally simpler than bidding as PDR/RDRR/PL in the CAISO
- PG&E has ideas on how to better integrate DR, that we are exploring with the CAISO

- What other topics or information would be helpful for future discussion?