Pacific Gas and Electric Company Pay for Performance Programs & Grid Resource Program Procurement

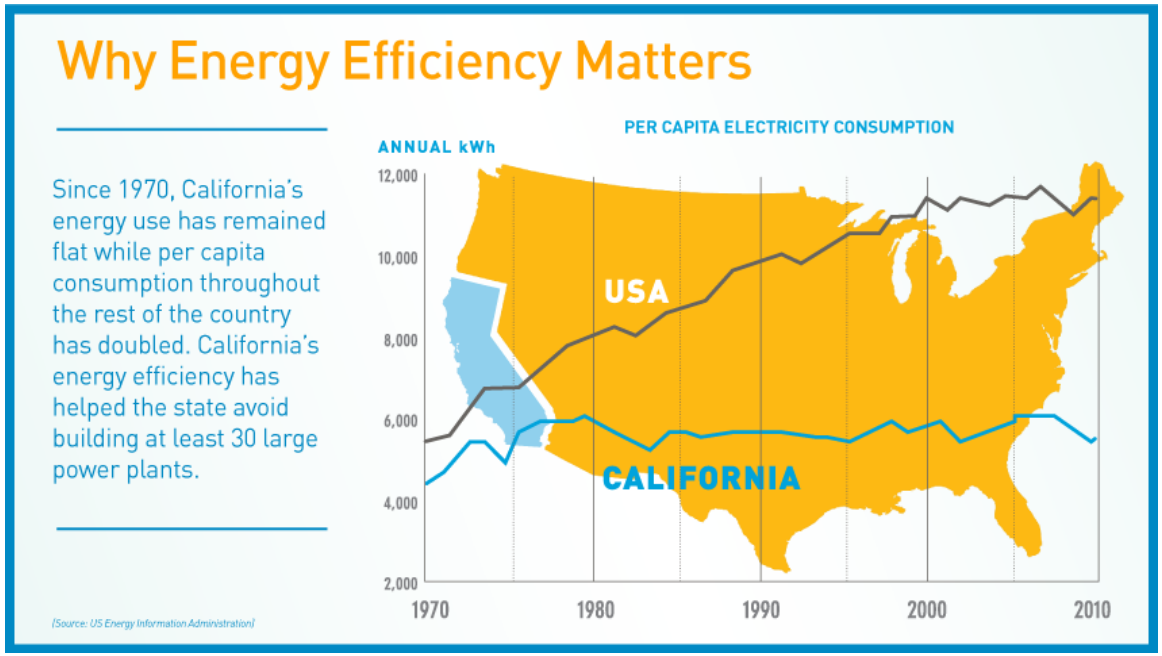
Modernising energy efficiency obligation programmes
10 December 2019

Together, Building
a Better California

Energy Efficiency in California

History

- Began in the 1970s
- Building and appliance Code drove savings
- Decoupling introduced – utility profits not tied to revenue
- Shareholder incentive introduced

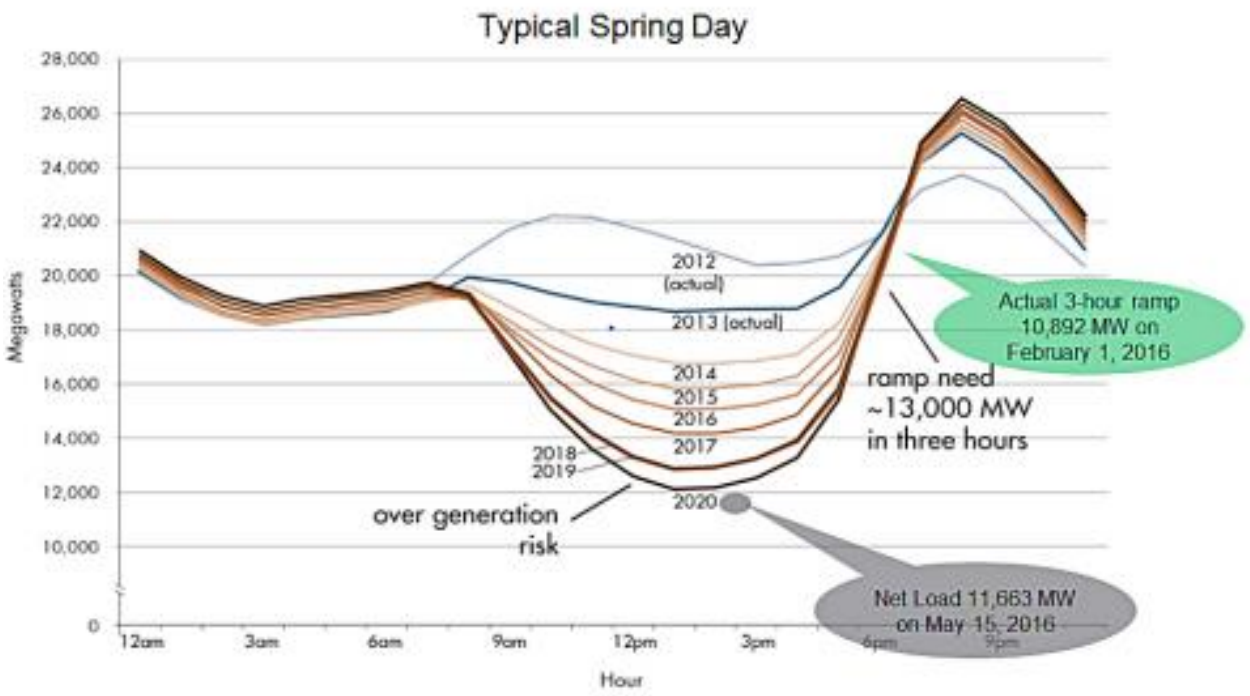


Currently

- $1 Billion/year in ratepayer funded EE
- Cost effective savings are mandated
- Huge variety of programs, channels and offerings

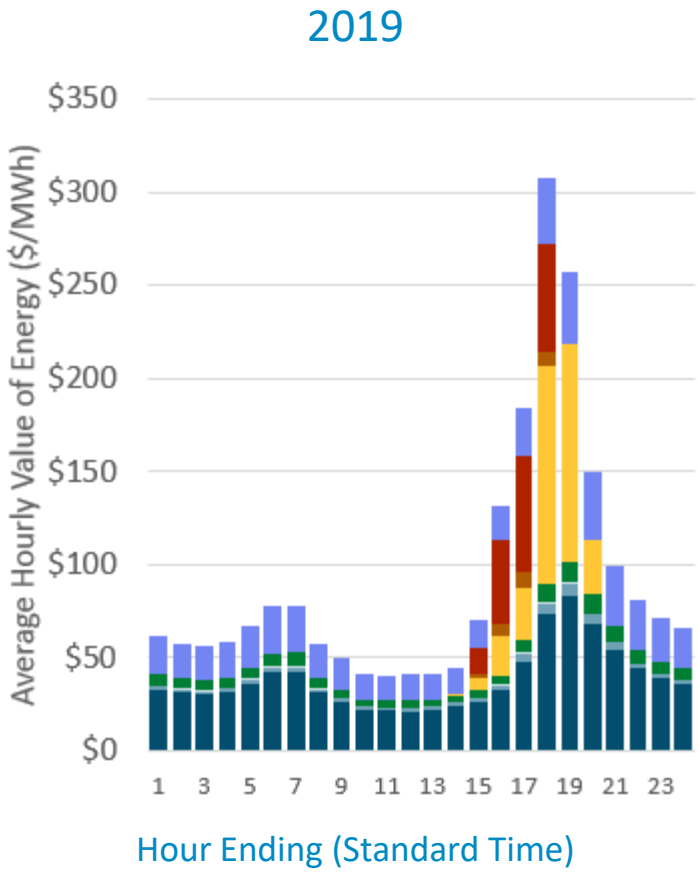
California Duck Curve

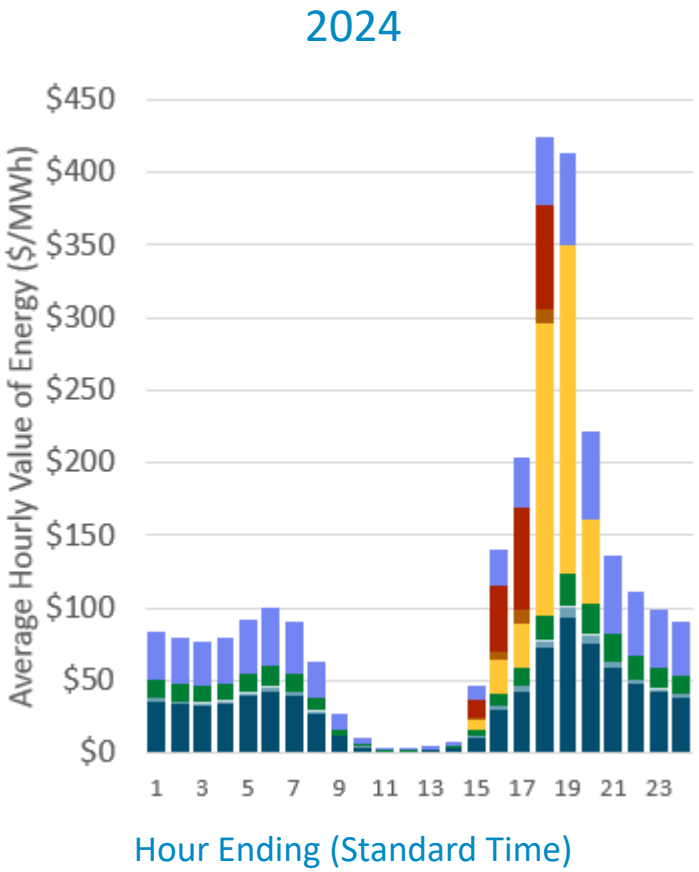
Figure 2: The duck curve shows steep ramping needs and overgeneration risk



Source: https://www.caiso.com/Documents/FlexibleResourcesHelpRenewables_FastFacts.pdf

Hourly Value of Energy (Electric)





- GHG Adder
- Distribution
- Transmission
- Capacity
- Cap and Trade
- Ancillary Services
- Losses
- Energy

Source (CZ4 Shown):
ftp://ftp.cpuc.ca.gov/gopher-data/energy_division/EnergyEfficiency/CostEffectiveness/ACC_2019_v1b.xlsb

Recent Impactful Legislation/Policy

California (CA) Senate Bill 350

- Doubles energy efficiency goals in existing buildings by 2030
- Calls out behavioral savings opportunities

CA Assembly Bill (AB) 802

- Allows “existing conditions” baselines
- Prioritizes weather normalized, “meter-based” savings

CA AB 793

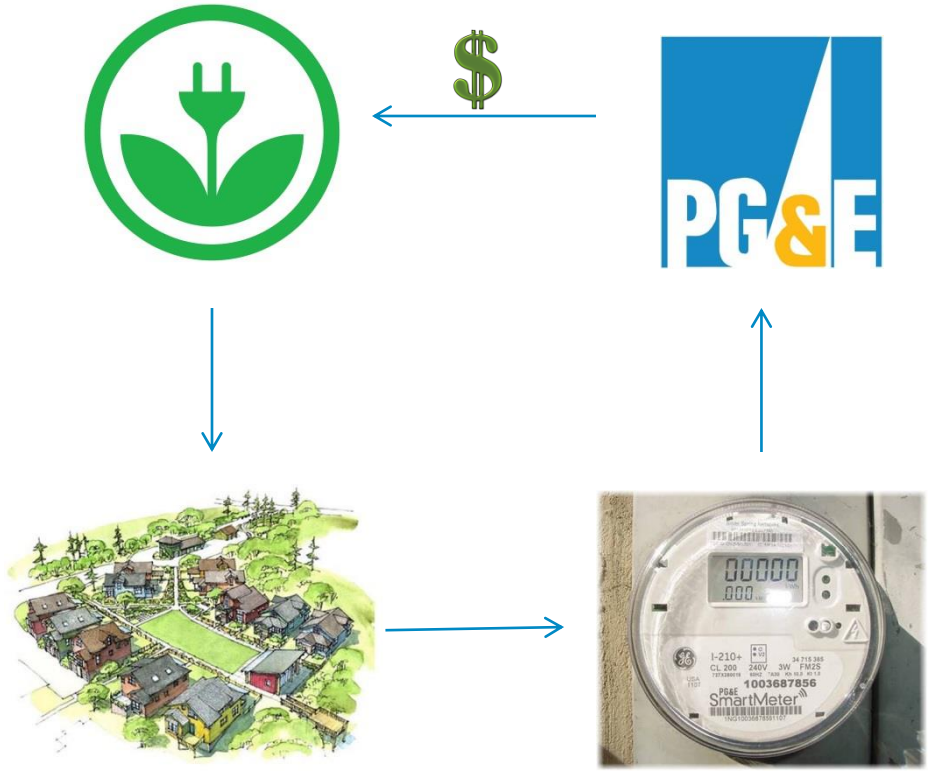
- Requires that real time energy usage data is made available to customers
- Requires utilities to incentivize energy management technologies

CA Public Utilities Commission Decision 16-08-019

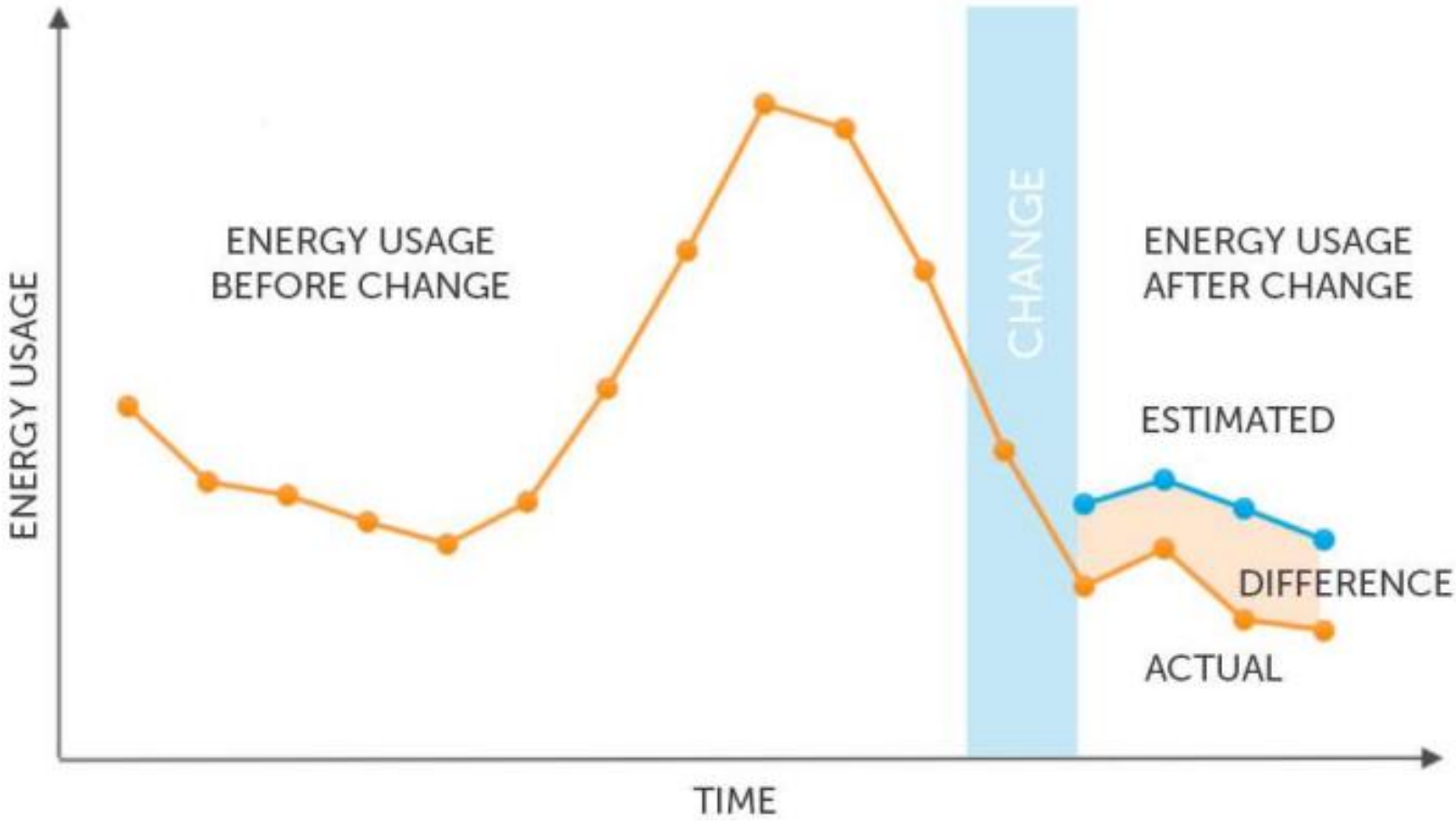
- Requires utilities to procure third party designed and implemented energy efficiency programs

Pay for Performance Program Model

Implementer/Aggregator

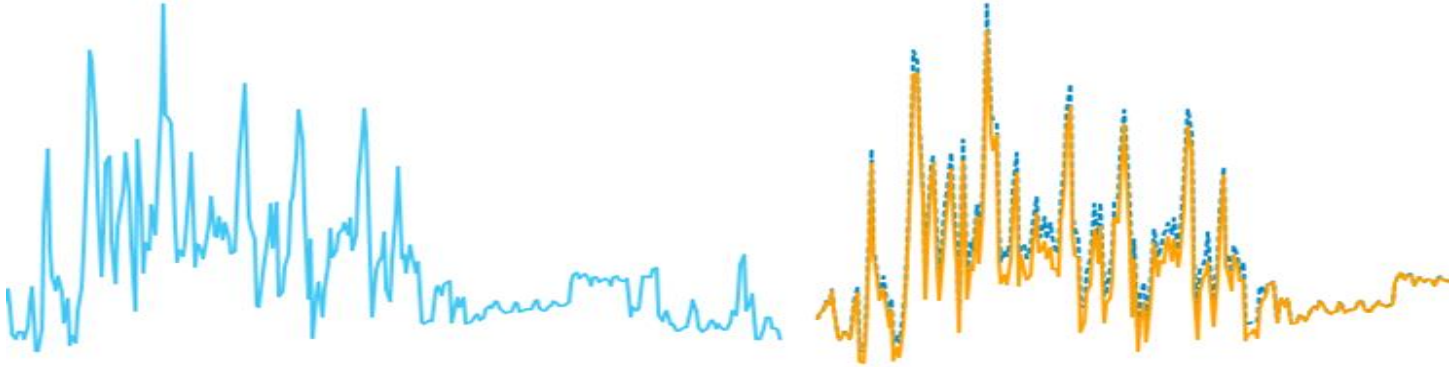


Meter Based Savings



Normalized Metered Energy Savings (NMEC) using CalTRACK

CalTRACK specifies detailed methods and data management procedures to calculate savings from EE projects.



Methods.

- Weather-normalized, project-level, pre-post estimate.
- Billing or daily data: change-point model based on PRISM.
- Hourly data: Lawrence Berkeley National Lab's Time of Week and Temperature model

Data handling.

- Data sufficiency criteria.
- Detailed definitions of missing data, outliers.

Information available at: caltrack.org

PG&E's Residential Pay for Performance (Res. P4P) Programs

Unparalleled flexibility to pursue a range of improvements and activities over time to achieve residents' savings goals

Retrofit

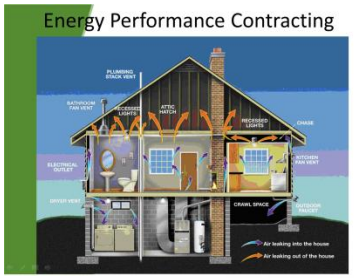
- Whole House
- HVAC
- Lighting
- Outdoor/Pool Deck

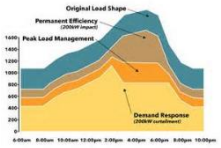
Operational

- Smart Thermostats
- Home Energy Management Systems
- Smart Appliances

Behavioral

- Homeowner Incentives
- Demand Response
- Other specially designed programs





Res. P4P Experience (so far)

Successful Solicitations

- We competitively procured four program contracts with three different implementers
- All contracts are entirely performance based using CalTRACK methods
- Two contracts contain variable pricing allowing us to value program energy savings in close alignment with real energy costs

Innovative Implementation

- Programs largely include behavioral and operational interventions to drive savings
- Customers are provided a strategic energy partner
- Implementers use data driven feedback to inform future program interventions

Challenges

- Incorporate behind the meter solar PV, battery storage, electric vehicle charging
- Ensuring program participant and data integrity
- Develop benefit and cost reporting structure able to accommodate new program model

Res. P4P Next Steps and Goals

Next Steps

- Develop track record to allow for accuracy in forecasting
- Incorporate wider range of distributed energy resources (DERs)
- Incorporate more dynamic pricing into future contracts

Program Goals

- Demonstrate program is a sustainable model for EE program portfolios
- Create a supportive data ecosystem
- Allow EE to emerge as a reliable grid resource

EE as a Grid Resource

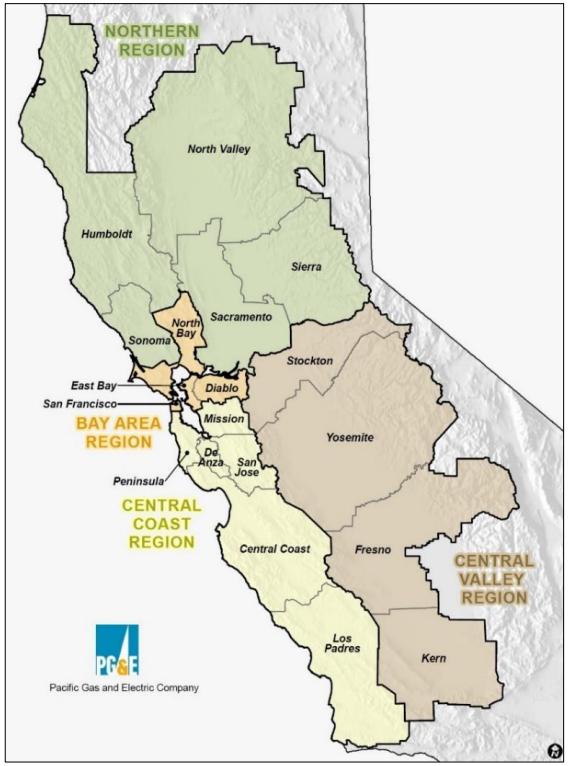
- PG&E invited Bidders to submit program designs that could demonstrate the capability of EE as a Distributed Energy Resource (DER).
- DERs must meet the same technical and operating standards as the rest of the distribution system such that when DERs are interconnected, they do not impact the safety and reliability of the grid.
- For EE, this requires a program that can deliver verifiable energy savings at:
  - Specific locations
  - Predictable times
  - Predictable levels (magnitude)
  - Acceptable levels of availability and assurance
- Grid Resource program proposals must target the right customers with the right measures at the right time and at the right locations such that the energy savings generated by the program naturally align to the specific locational and temporal needs of the grid.

EE as a Grid Resource

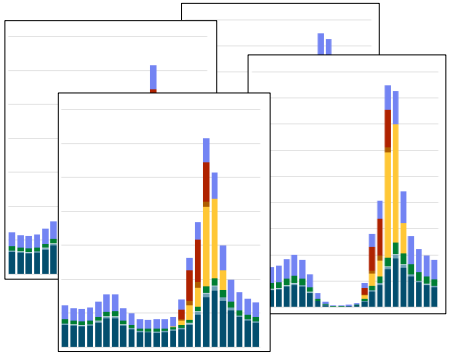
- PG&E's objective for Grid Resource programs in this RFP is to identify innovative EE program designs that demonstrate EE can provide energy savings with the level of precision and confidence equivalent to other DER technologies.
- There are two requirements for a program to be considered as a Grid Resource program in this RFP.
  - Grid Resource programs require a **meter-based approach and support near real-time Embedded M&V** to deliver verified energy savings and/or capacity reductions that can be substantiated, commercially transacted and settled to terms on par with other DER technologies.
  - Grid Resource Programs must be informed by both **customer data and grid data** to create a program design that can target customers in a region with the right measures, so the energy savings produced coincides when they are most needed by the grid which varies by the time of day, the time of year, and geographic location.
- At this stage, such program structures will not need to defer distribution capital investments or relieve grid constraints, avoiding the risk to system reliability and the associated punitive commercial terms that follow.
- It is PG&E's expectation that some or all of these Grid Resource programs will, at some point in the future, serve these grid resource roles.

EE as a Grid Resource

- The dynamic interplay between weather patterns (coast, valley, mountain), development (urban, suburban, rural), and other regional factors (commercial / industrial activity and customer adoption of rooftop solar) coalesce and create distinct variations in grid needs across the various Distribution Planning Regions.
- This analysis is depicted as a simple delivery window for each DRP and can be seen in Figure 5.6 – PG&E DPR Savings Delivery Windows.
- For each DRP Region, energy savings delivered during the time frames indicated in green are designated as preferred. Energy savings delivered outside of these timeframes are also accepted.



DPR Energy Savings Delivery Windows																								
Bay Area Region											10:00am - 10:00pm													
Central Coast Region											10:00am - 10:00pm													
Central Valley Region													12:00pm - 11:00pm											
Northern Region														1:00pm - 10:00pm										
Hour Beginning	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23



Thank You

Al Gaspari Jr.
Alfred.Gaspari@pge.com

Matt Braunwarth
Matthew.Braunwarth@pge.com

Ben Brown
Ben.Brown@pge.com