DEMAND-SIDE ALTERNATIVES TO TRADITIONAL SUPPLY-SIDE INVESTMENTS: UPDATED AND NEW APPROACHES IN CALIFORNIA

WEBINAR: PUTTING EFFICIENCY FIRST INTO PRACTICE – INSIGHTS FROM THE US AND THE EU

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Rob Peterson and Naseem Golestani
Energy Division, California Public Utilities Commission

Presentation Overview

1. California Electric Grid and Terminology
2. Distributed Energy Resources (DERs)
3. Distribution Investment Deferral Framework (DIDF)
4. DIDF Outcomes Summary
5. Updates to Procurement Process for DIDF Front-of-the-Meter DERs
6. New Behind-the-Meter DER Procurement Approach: The Partnership Pilot
7. Partnership Pilot Elements and Example
8. Incrementality

California Electric Grid Overview

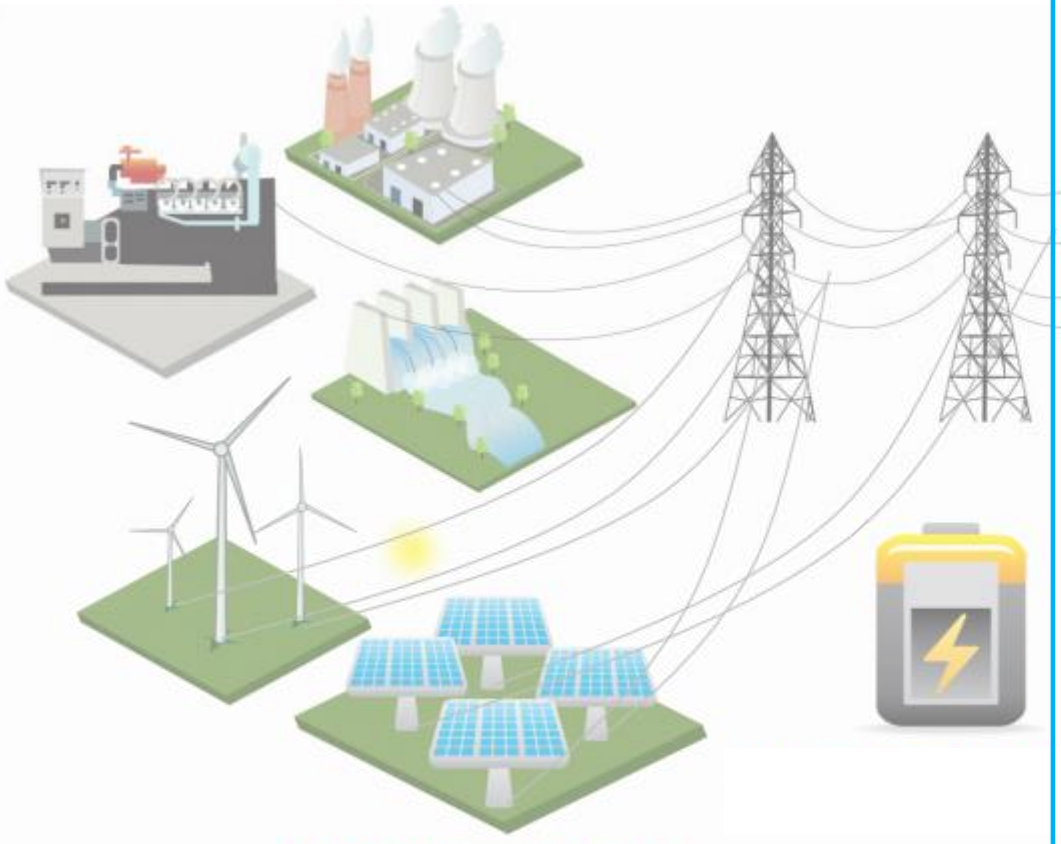
Three Major Components:

1. **Generation**
   - Competitive Market
2. **Transmission System**
   - Investor-Owned Utilities (IOUs), monopoly utilities
     - Pacifica Gas & Electric (PG&E), Southern California Edison (SCE), San Diego Gas & Electric (SDG&E)
3. **Distribution System**
   - IOUs: PG&E, SCE, and SDG&E
   - Distributed Energy Resources (DERs)

Note: The California electric IOUs are not strictly "wires-only" utilities, but the generation market is still competitive.

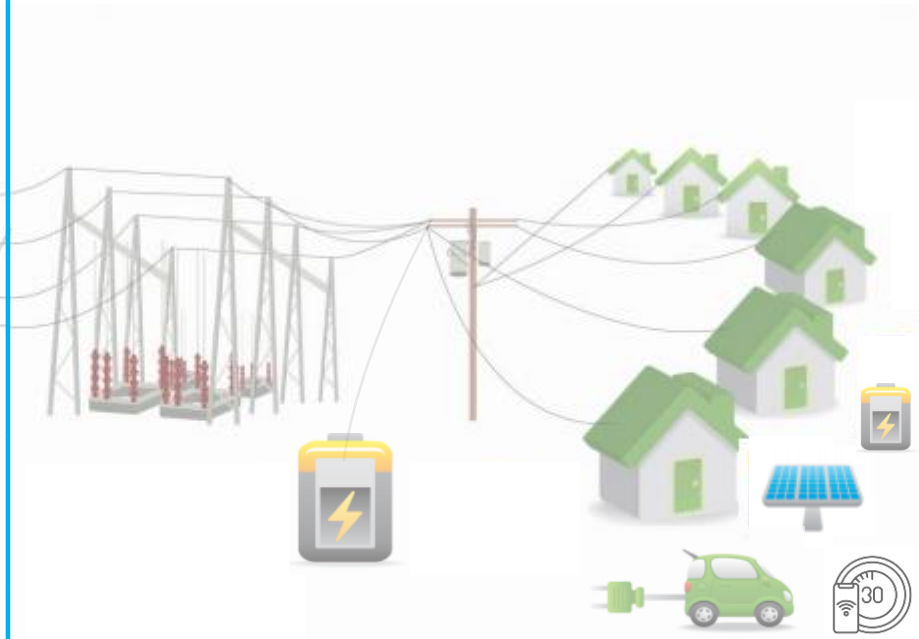
CAISO (Transmission), CPUC (Distribution)

California Independent System Operator (CAISO)



Transmission Grid

California Public Utilities Commission (CPUC)



Distribution Grid

Distributed Energy Resources (DERs)

Demand-Side Resources, including:

1. Energy Efficiency
2. Demand Response

Also:

3. Solar Generation
4. Battery Storage
5. Microgrids
6. Electric Vehicles (with Vehicle-Grid Integration)
7. Others

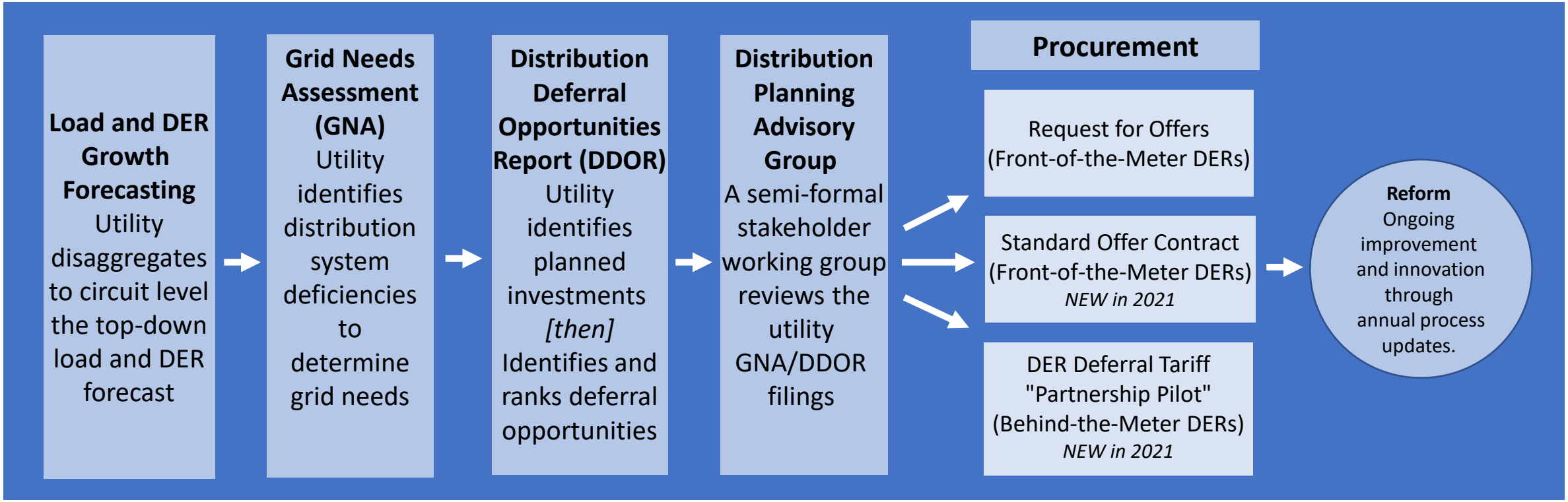
Other Acronyms and Definitions for Today

- **IOU:** Investor-owned utility (e.g., PG&E, SCE, and SDG&E)
- **NWA:** non-wires alternative (demand-side alternative to traditional supply-side investment)
- **Traditional grid infrastructure:** supply-side investment, e.g., power lines and substations
- **BTM:** Behind-the-Meter DER
- **FOM:** Front-of-the-Meter DER
- **DIDF:** Distribution Infrastructure Deferral Framework
- **GNA/DDOR:** Grid Needs Assessment/Distribution Deferral Opportunity Report
- **RFO:** Request for offers (an approach to competitive, third-party FOM DER procurement)
- **SOC:** Standard offer contract (a streamlined approach to competitive, third-party FOM DER procurement)
- **Deferral Tariff:** A new approach to BTM DER procurement
- **Partnership Pilot:** A pilot to test the Deferral Tariff

CPUC Regulatory Process

- 2013 California State legislation
  - Defined Distributed Energy Resources (DERs)
- CPUC opened two regulatory proceedings
  - Distribution Resources Plans (DRP) proceeding
  - Integrated Distributed Energy Resources (IDER) proceeding
- DRP Proceeding Scope (summary statement)
  - To determine the value that DERs provide the electric grid such that DERs can be appropriately incentivized and compensated and in doing so identifying and animating opportunities (also removing barriers) for DERs to be installed and optimally sized and sited such that they are cost-effective in comparison to traditional grid upgrades while also reducing GHG emissions from fossil-fuel generators.
- Distribution Investment Deferral Framework (DIDF)

Distribution Investment Deferral Framework (DIDF) Overview



*The California Energy Commission prepares the top-down load forecast used by the IOUs. The same top-down load forecast is used as the basis for the CPUC's Integrated Resources Plan process and California Independent System Operator's Transmission Planning Process.

Summary of DIDF Outcomes

DIDF Cycles to Date

- 2018/19 (closed), 2019/20 (closed), 2020/21 (RFOs launched), 2021/22 (starting, load forecasting)

Combined Solicitation Results

DERs to Defer Traditional Distribution Infrastructure	DERs for Resource Adequacy Only
23 MW	15.5 MW

- Three RFO solicitations launched (January 2019, 2020, and 2021)
- Only two of the utility companies have opened solicitations (PG&E and SCE)
- No DERs contracted under DIDF are operational yet
- The RFO solicitation process takes 6 months (or more) to contract execution
- Only front-of-the-meter battery storage DERs contracted

DIDF Challenges and 2021 Updates (Reforms)

1. RFO process takes too long
   - Reforms:
     - RFOs launch earlier in DIDF cycle and without CPUC approval to launch
     - Test new Standard Offer Contract procurement approach
2. BTM DERs not procured in DIDF RFOs
   - Reform:
     - Test new DER Deferral Tariff (Partnership Pilot) procurement approach

Partnership Pilot Overview

Program Goal

Increase opportunities for aggregations of customer-hosted BTM DERs to provide the deferral services that avoid costly grid upgrades, save ratepayers money, and increase the financial attractiveness of BTM DERs.

Overview

1. Utilities identify future grid need in a specific location of the distribution grid through the DIDF process
2. Customers in that location sign up to the tariff program via Aggregators during subscription periods
3. Utilities communicate with Aggregators who then coordinate with customers to collectively defer grid need

Difference with RFO: Ratable Procurement

Ratable Procurement

- Grid need broken into increments with annual procurement goals (i.e., procurement tranches)
- Procure incremental capacity each year to defer long term needs
- Aimed at longer term needs 4-5 years out
- In contrast to RFO where single large DER deferral project meets entire forecasted grid need
- If any of the annual procurement goals are not met, the Utility would cancel the tariff subscription and execute the original grid upgrade (i.e., contingency plan).

Benefits

- Easier to enroll many small customer-hosted DERs
- IOUs can respond to changes in load forecasts (decrease risk of over/under procurement of DERs).
- Infrastructure deferral for longer term needs possible: enough time for customer enrollment
- Capture BTM DER grid benefits

Partnership Pilot: Example

- **Scenario**: A neighborhood in a Utility's service territory is expected to add new homes, businesses, and retail buildings that are forecast to exceed distribution line capacity. Forecasted grid need is 3 MW by 2026.
- **Planned Investment**: Utility designs a traditional investment to address the capacity need. Capacity need begins in 2022 and steadily increases each year (see table).
- **Deferral Opportunity**: DERs to meet combined, forecast grid need of 3 MW by 2026.
- **Deferral Value (i.e., Cost Cap)** = maximum DER expenditure that is cost effective in comparison to the traditional investment

Table: Forecast Need Year and Annual Procurement Goal (megawatts)

	2021	2022	2023	2024	2025	2026	Total
Forecast Grid Need	0	0	0.5	1	1	0.5	**3**
Annual Procurement Goal	0	0.5	1	1	0.5	0	**3**

Tiered Payment Structure

Payment Tier	Percent of Project Budget	Description
Deployment Payment	20%	Upfront payment to customers who enroll and commit to operating their *new* DER(s) to provide a single or multiple capacity service specified in the tariff. Customers with existing DERs not eligible for this payment.
Reservation Payment	30%	Customer paid to hold capacity in reserve if called during specified deferral season.
Performance Payment	50%	Customer paid to dispatch in response to a specified service event, as defined in the tariff.

Solutions to Over/Under Procurement Risk

Risk of Over and Under Procurement

- Annual grid need change increases or decreases compared to the original forecast.

Protection Mechanisms

1. DER budget set at 85% of the cost cap
2. Procurement margin set at 120%
3. Ratable procurement – can update procurement goals to reflect changing load forecast
4. Acceptance trigger set at 90% to give certainty to developers
5. Tiered payment structure

Addressing Ambiguous Incrementality Rules

Incrementality Rules:

- Intended to ensure DERs that are part of other customer programs are not paid twice for the same service.

Reform Purpose:

- Allow value stacking with participation of existing DERs in distribution deferral

Programs this could apply to:

- Self-Generation Incentive Program (SGIP)
- Net Energy Metering (NEM)
- Energy Efficiency programs
- Demand Response programs

Key to Approach:

- Partnership Pilot, SOC, and RFO are payments for grid services, ***not*** incentives

Additional Benefits and Challenges to Monitor

Potential Benefits	Potential Challenges
• Simplified contract tariff has significantly lower transaction cost compared to DIDF RFO process • Enables wider range of customers to participate in the tariff with BTM DERs • BTM DERs have very short interconnection period compared to FOM DERs	• Deploying large numbers of BTM DERs in a tight time frame to meet grid needs is untested • Potential coordination issues between utilities and aggregators and aggregators and customers • Success and cost of customer acquisition • With increased grid need, reservation and performance payments may be too low to attract customers

Resources

- News Articles
  - https://www.greentechmedia.com/articles/read/californias-plan-to-crowdsource-distributed-energy-to-replace-grid-upgrades
  - https://microgridknowledge.com/california-non-wires-alternatives-ders/
- DIDF Retrospective Blog
  - https://gridworks.org/category/drp-retrospective
- CPUC Deferral Tariff Final Decision
  - https://docs.cpuc.ca.gov/SearchRes.aspx?DocFormat=ALL&DocID=365628213
- Distribution Resources Plan (DRP) Proceeding (R.14-08-013)
  - https://www.cpuc.ca.gov/General.aspx?id=5071
- Integrated Distributed Energy Resources (IDER) Proceeding (R.14-10-003)
  - https://www.cpuc.ca.gov/General.aspx?id=10710

Thank you!

Naseem Golestani

naseem.golestani@cpuc.ca.gov

Rob Peterson

robert.peterson@cpuc.ca.gov

Additional Slides for Further Details

Public Utilities Code MEN 769 Text As Jointly Implemented in Two CPUC Proceedings: Distribution Resources Plans (DRP) and Integrated Distributed Energy Resources (IDER)

DRP

1) Evaluate locational benefits and costs of distributed resources located on the distribution system. This evaluation shall be based on reductions or increases in local generation capacity needs, avoided or increased investments in distribution infrastructure, safety benefits, reliability benefits, and any other savings the distributed resources provide to the electric grid or costs to ratepayers of the electrical corporation;

IDER

2) Propose or identify standard tariffs, contracts, or other mechanisms for the deployment of cost-effective distributed resources that satisfy distribution planning objectives;

3) Propose cost-effective methods of effectively coordinating existing commission-approved programs, incentives, and tariffs to maximize the locational benefits and minimize the incremental costs of distributed resources;

DRP

4) Identify any additional utility spending necessary to integrate cost-effective distributed resources into distribution planning consistent with the goal of yielding net benefits to ratepayers; and

5) Identify barriers to the deployment of distributed resources, including, but not limited to, safety standards related to technology or operation of the distribution circuit in a manner that ensures reliable service.

PU Code 769 and Distribution Resources Plans Proceeding Objectives

PU Code Section 769

- IOUs file Distribution Resources Plan (DRP) proposals by July 1, 2015 to identify "optimal" locations for the deployment of DERs.
- Approved DRPs must minimize overall system costs and maximize ratepayer benefit from investments in DERs.
- IOUs shall propose distribution infrastructure upgrades that may be approved if ratepayers realize net benefits and costs are just and reasonable.

Proceeding Objectives

- Develop new tools, processes, and investment frameworks that enable IOUs to better integrate DERs into grid operations and the annual distribution planning process.
- Modernize distribution system to accommodate two-way energy flows.
- Enable customer choice of new technologies and services that reduce emissions and improve reliability.
- Realize opportunities for DERs to provide benefits through the provision of grid services.

Notable 2021 DIDF Reforms

- Further standardization of the metrics used by IOUs to assess project deferability by DER
- Cost cap for each DER procurement opportunity is public information
- Integration Capacity Analysis web-based IOU map data to be validated by third party
- Additional 2021 third-party expert reports:
  - Independent Profession Engineer report comparing completeness and usefulness of IOU filings
  - Independent Evaluator report comparing IOU procurement processes

Terms and Definitions

- **Subscription Period**: The period during which Partnership Pilot offers are accepted. Subscription period length is dependent on the planned investment. It extends from the date of subscription period launch until: (1) enough offers are accepted to meet the grid need (including a margin allowing for attrition); or (2) the date determined by the IOU for contingency plan implementation.
- **Contingency Date**: The date identified by the IOU for contingency plan implementation. It marks the point at which an IOU no longer pursues the deferral of a traditional planned investment by procuring DERs. Instead, the IOU moves forward with the traditional solution. Contingency plans and their implementation date are specific to a planned investment. Each contingency date and plan depend on grid need type and timing and the lead time needed to implement the traditional solution.
- **Cost Effectiveness Cap**: This cap is specific to each planned investment. For tariff purposes, it is calculated by the IOUs and published with subscription period launch. DERs that are procured individually or in aggregate for an amount equal to or less than the cost cap are considered cost effective. Staff proposes that the cost cap be used as the basis for tariff budgets.

Terms and Definitions

- **Tariff Budget**: The tariff budget is based on the cost cap specific to each investment. At this time, the tariff budget is set at 85% of the cost cap to ensure cost-effectiveness and ratepayer savings.
- **Aggregator**: An entity that coordinates the operation and dispatch of multiple DERs pursuant to a tariff or other contractual agreement.
- **Candidate deferral opportunity**: A planned investment included on the shortlist of traditional projects to be deferred using DERs (i.e., “non-wires alternatives”) after passing the two initial deferral screens: the technical and timing screens.
- **Planned Investment**: A traditional (“wired”) distribution investment identified by an IOU in the DDOR to address one or more grid needs presented in the GNA.