

DR Integration

Fostering Innovation, Maintaining Standards

June 15, 2011





Agenda

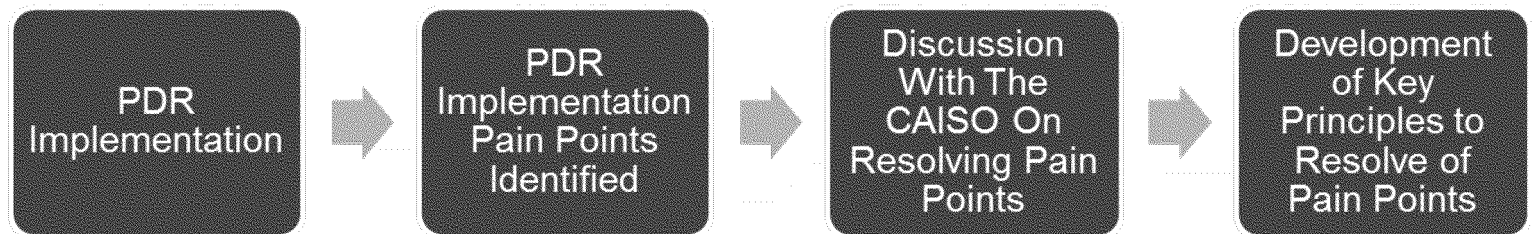
- Introductions
- Discussion of the CAISO Work on Metering and Telemetry
- Discussion of the CAISO RFP of the System Costs for Distributed Energy Resources
- Presentation on the Touch Points, the Need For Explicit Objectives And Minimum Standards, and Cost Minimization
- Discussion on Visibility of Demand Response Resources
- Next Steps



Background

PG&E has implemented a system to be able to integrate its PeakChoice DR program into the CAISO market. In this process, some pain points were identified and PG&E reached out to the CAISO to help resolve these pain points.

PROCESS THUS FAR



**OUR THINKING HAS EVOLVED SINCE THEN
INTO EXPLICIT GOALS AND STANDARDS**



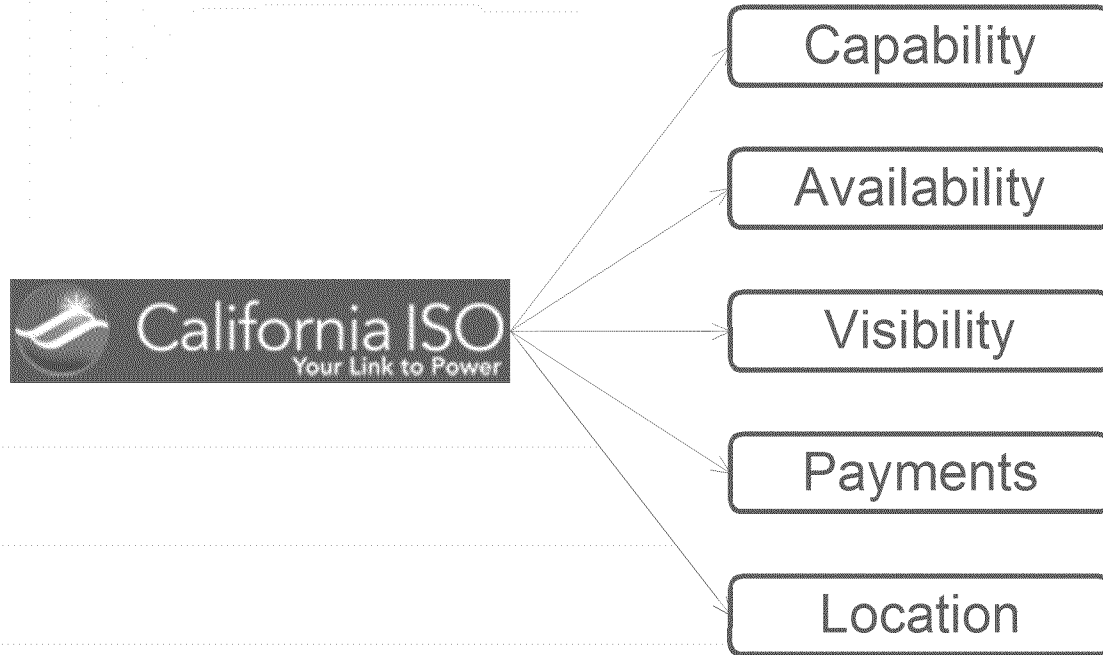
CAISO Needs

PG&E believes that the CAISO needs the following from all resources to be able to fulfill its mandate to operate its control area reliably and at least cost

- **Capability:** The performance capabilities of the resource, such as ramp rate, Pmax, and Pmin
- **Availability:** Bids and schedules into the market as well as forced and planned outages
- **Visibility:** Knowledge of the operating level and response of resources to dispatches
- **Payments:** Financial settlements with other parties
- **Location:** Location of resources to manage the grid

CAISO Needs

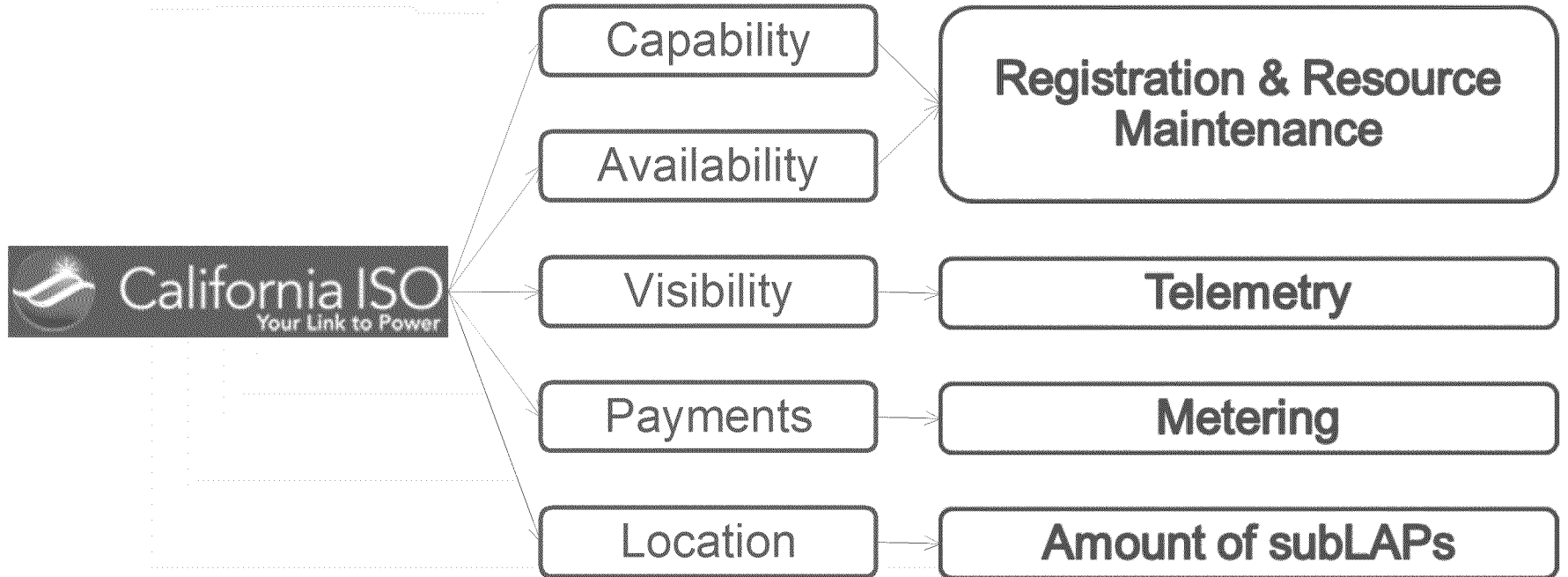
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CAISO Needs → PG&E Pain Points

Each of these needs has led to a pain point for DR resource integration.





PG&E Issue List

PG&E initial issue list aligns with these key needs of the CAISO.

Registration & Resource Maintenance

- Issue 3. Need to register each mass market customer for PDR
- Issue 4. Requirement to update master file for rapidly changing resources
- Issue 5. Certification of A/S resources
- Issue 6. Need to have a separate PDR for each LSE

Telemetry

- Issue 1. Telemetry is required for any resource larger than 10 MW (for PDR, RDRP, and PL mechanisms)
- Issue 2. Type of telemetry required for Ancillary Services

Metering



- Issue 9. Requirement to provided Settlement Quality Meter Data by T+5B

Amount of subLAPs

- Issue 7. The number of SubLAPs for PG&E is excessively high
- Issue 8. SubLAPs do not roll up to the Local Capacity Areas



Root Cause Of The Pain Points

PG&E believes that the root cause of the DR integration pain points is due to historical standards from different resources applied to a fundamentally different resource type.

Registration & Resource Maintenance

Central Issue – Historical paradigm of one unchanging physical resource versus new paradigm of many changing underlying physical resources

Telemetry

Central Issue – Historical paradigm of one large physical resource versus new paradigm of many changing underlying physical resources and the cost for the provision of such telemetry

Metering

✓ Central Issue – Historical paradigm of one physical resource operating at wholesale market timelines versus new paradigm of many changing underlying physical resources operating at retail billing timelines.

Amount of subLAPs

Central Issue – Historical paradigm of one unchanging physical resource versus new paradigm of many distributed underlying physical resources



Need For Explicit Objectives & Standards

Current operating methods were based on objectives and goals to mitigate risks and costs that operators and planners faced. To resolve the integration difficulties for the CAISO and DR resources, explicit objectives and goals need to be defined to understand the underlying needs and how these new resources can best satisfy them.

- Explicit Objectives allows the CAISO to justify the allowance or disallowance of resources into specific markets
- Explicit Standards provide a goal for resources to achieve
- Explicit Objectives and Standards encourage innovation in meeting the Objectives and Standards in lower cost ways, expanding the potential pool of new resources

Example Objective: Maintain Area Control Error below NERC standards

Example Risk: Instability of frequency→ Cost: Increased imbalance energy and possible loss of firm load

Example Standard: 95% of MW of resources must provide information of their current operating level within ± 5 MW (99th percent confidence) within 1 minute to the CAISO to be able to maintain Objective while the amount of ramping resources is less than 1000 MW



Fostering Innovation and Cost Minimization

By providing a minimum standard, new methods of meeting the CAISO's needs can be developed.

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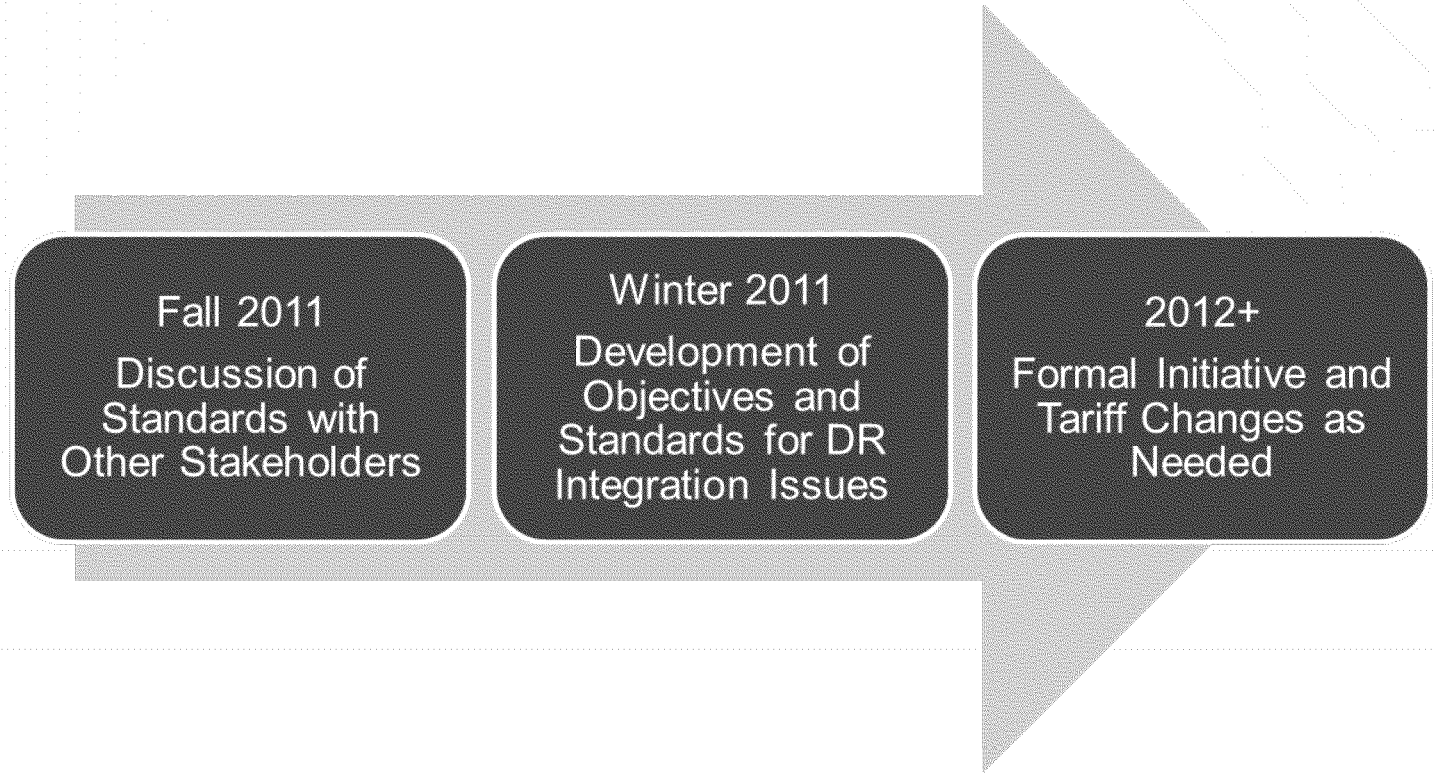
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Example Solution: For distributed demand side resources, provide a static look up for the current operating level



Collaboration & Simplification

PG&E believes that this needs to be a collaborative effort and that at the end of each formal objective, risks, benefits, and standard, the CAISO can be agnostic to resource type and be able to meet changing conditions with completely justified rationales.



Thank You

