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RETI 2.0 Plenary Group Workshop : Resource Values

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Agenda

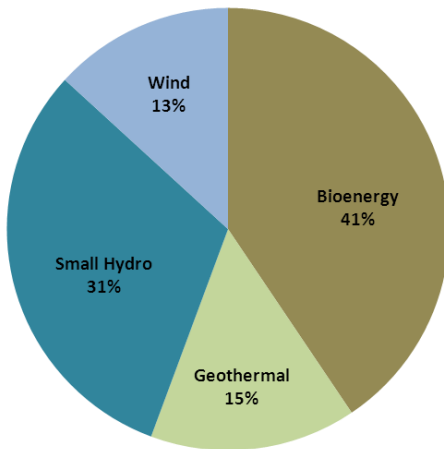
- **PG&E's Renewables Portfolio**
- **PG&E's Long-Term Resource Planning**
- **PG&E's RFO Valuation**
- **RPS Calculator**
- **RETI 2.0 Proposed Focus Areas**



Renewable Portfolio Progress

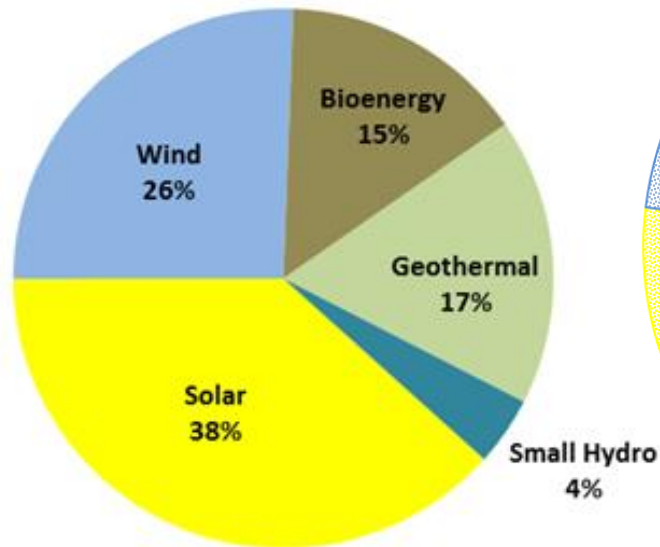
PG&E has a diverse portfolio of RPS resources

2002 Actual
11% of total bundled retail sales



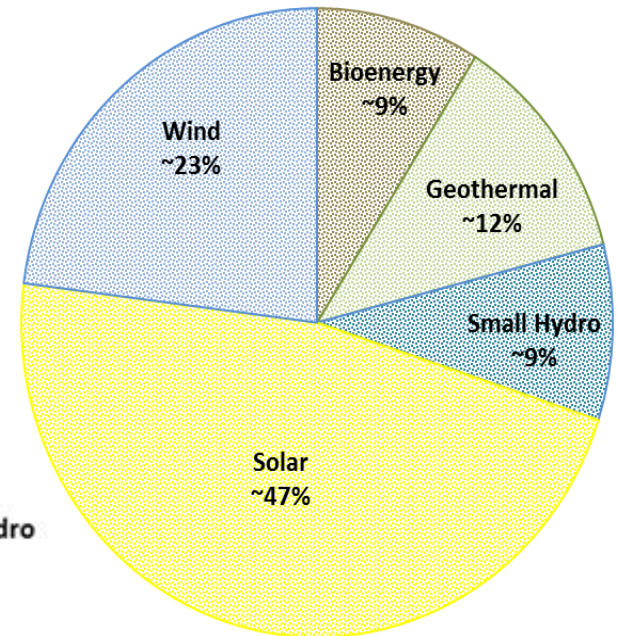
Total RPS-Eligible Procurement
7,504 GWh

2015 Preliminary
30% of total bundled retail sales



Total RPS-Eligible Procurement
21,291 GWh

2020 Forecast
37% of total bundled retail sales



Total RPS-Eligible Procurement
22,051 GWh



Statewide Resource Planning Processes

PG&E actively participates in existing statewide resource planning proceedings

CEC

- Integrated Energy Policy Report (IEPR)

CPUC

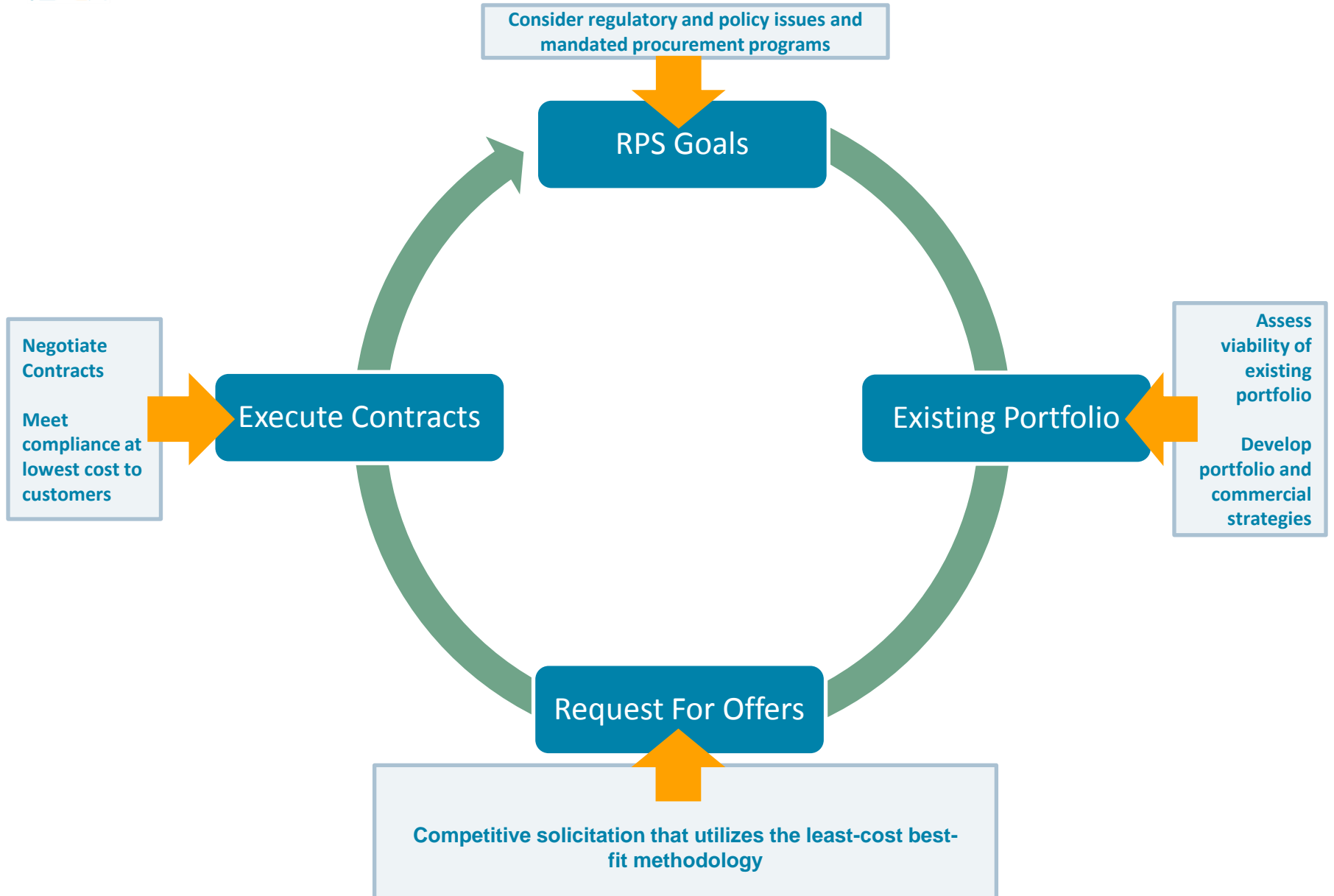
- SB 350 Integrated Resource Plan (IRP)
- Long-Term Procurement Plan (LTPP)
- Resource Adequacy (RA)
- RPS Plan
- RPS Calculator
- Distribution Resources Plan (DRP)

CAISO

- Transmission Planning Process (TPP)



RPS Procurement Process





PG&E's RPS Valuation Methodology

“Least-cost best-fit” (LCBF) allows for the fair evaluation of different technologies and locations in RPS solicitations

- **Quantitative Criteria**
 - **Net Market Value**
 - **Portfolio Adjusted Value**
- **Qualitative Criteria**
 - **Project Viability**
 - **RPS Goals**
 - **Supplier Diversity**



Quantitative Valuation: Net Market Value

$$\text{(Adjusted) Net Market Value} = E + C + S - (P + T + G + I)$$

- E = Energy benefit
 - Based on market prices and Locational Marginal Pricing (LMPs).
 - Includes energy value from Buyer Curtailments for avoiding (presumably negative) wholesale market price for the Offer's energy delivery.
- C = Capacity benefit is based on
 - PG&E's internal estimate of avoided cost of capacity, and
 - Offer's contribution to meeting PG&E's future Resource Adequacy requirements
- S = Ancillary Service benefit based on Offer's Ancillary Service capability. Assumed to be zero for non-dispatchable offers.
- P = Post TOD Adjusted PPA Price based on Offer's contract price and TOD factors and includes debt equivalence
- T = Transmission Network Upgrade Cost Reimbursable portion of the costs of interconnection, as identified in the interconnection studies or interconnection agreement
- G = Congestion Cost multipliers applied to reflect congestion and losses
- I = Integration Cost calculated pursuant to D. 14-11-042



Quantitative Valuation: Portfolio Adjusted Value

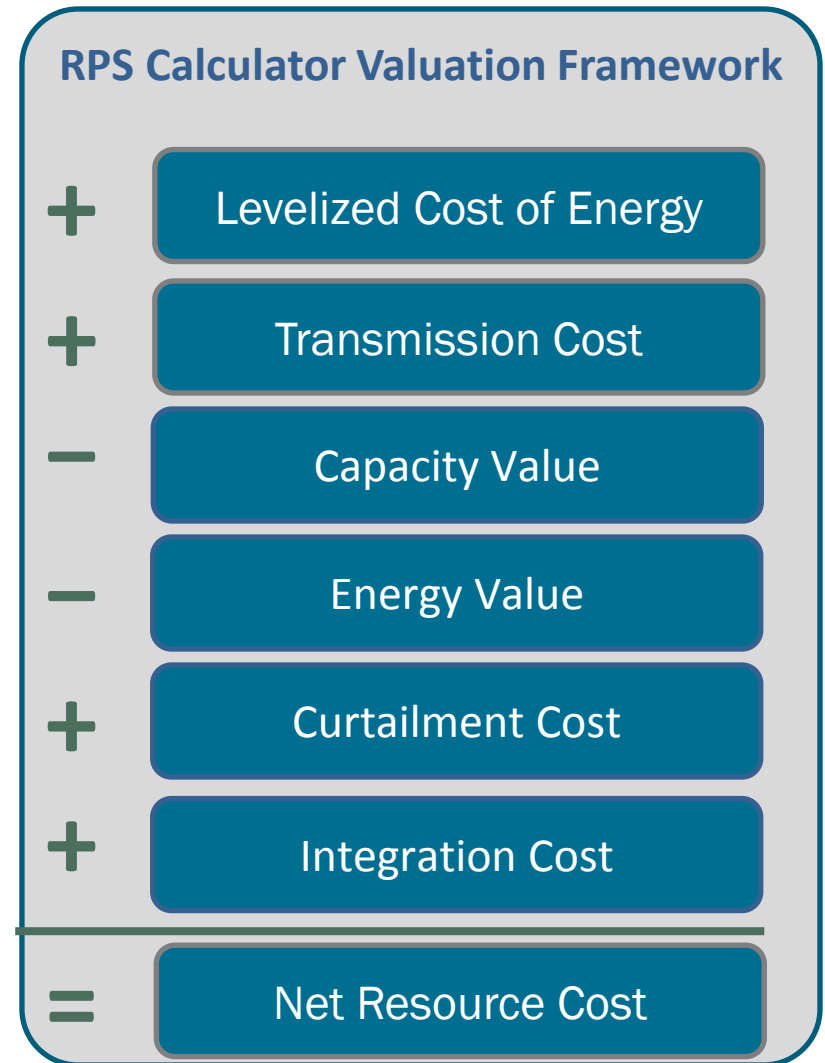
- **PAV is intended to represent the value of an Offer in the context of PG&E's electric portfolio by making explicit and systematic adjustments for PG&E's preferences on each component.**
- **PAV calculations make explicit and systematic adjustments to NMV to reflect portfolio effects and preferences that benefit PG&E customers**
- **PG&E will evaluate PAV by adjusting NMV by the following components:**
 - **Location**
 - **RPS Portfolio Need**
 - **Energy Firmness**
 - **Curtailement**



RPS Calculator

RETI 2.0 can assist in creating inputs into the CPUC's RPS Calculator

- Mimics the IOUs' LCBF procurement methodology
- Uses public data to create a renewable energy supply curve
- Provides inputs into existing planning proceedings (LTPP and TPP)
- Considers the impact of location and technology on resource value and transmission availability





Proposed RETI 2.0 Focus Areas

- **Inform future inputs and tools used in existing regulatory proceedings, such as the RPS Calculator, LTPP, and the TPP.**
- **Address the key renewable energy and transmission issues that have emerged in other relevant proceedings:**
 - **Out-of-state renewables**
 - **Potential CAISO expansion**
 - **Energy-only RPS resources**