Large IOU Progress Towards 33% RPS and Transition to IRP

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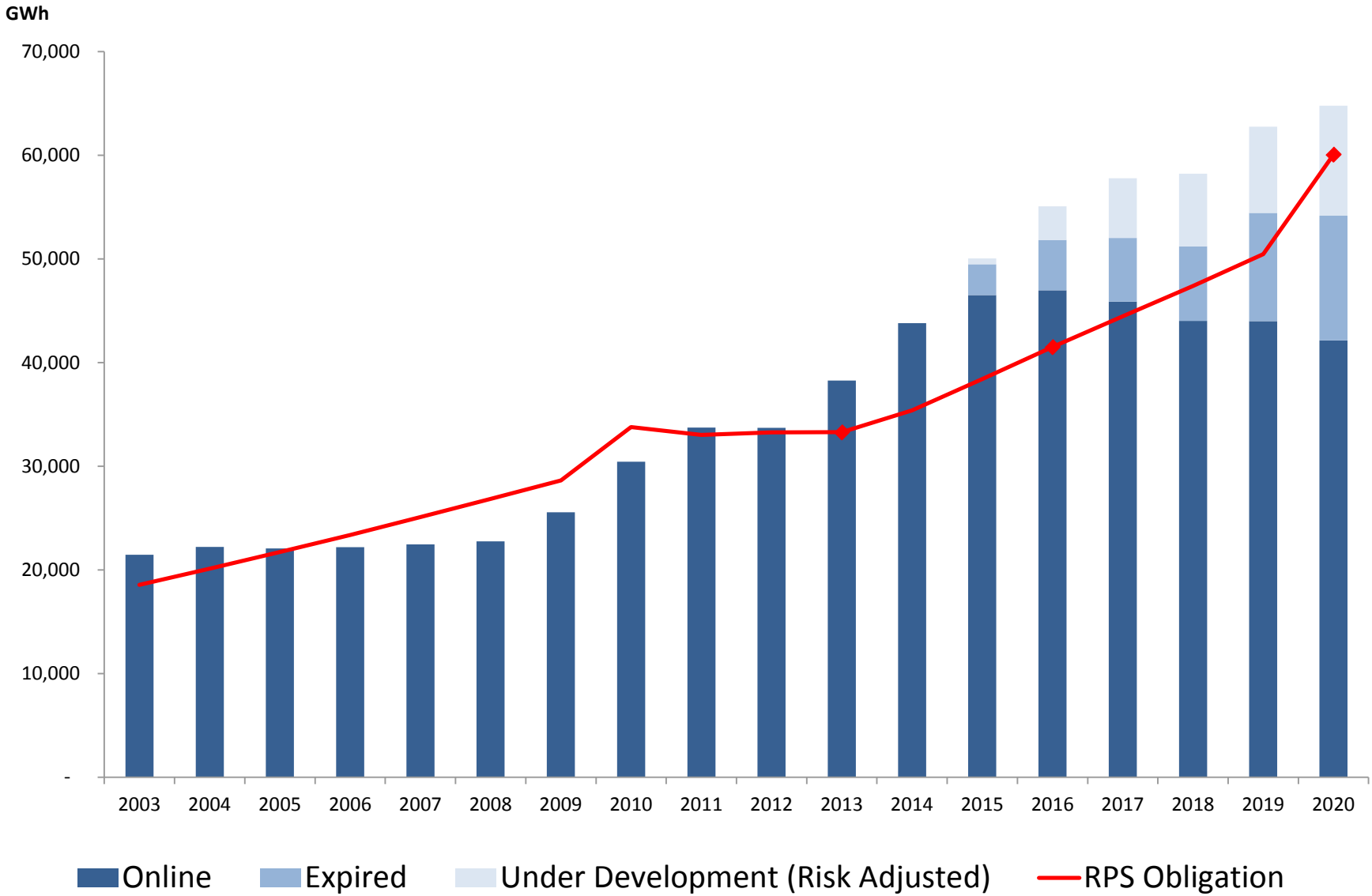
May 12, 2016

RPS Progress Towards Major Program Milestones

- The large IOUs each met their RPS compliance obligations in the first compliance period (2011-2013)
- The large IOUs forecast that they will be able to meet their RPS compliance obligations in the second(2014-2016) and third (2017-2020) compliance periods

	2014			2020		
	Retail Sales	RPS Procurement	RPS %	Retail Sales	RPS Procurement	RPS %
PG&E	74,547	20,156	27.0%	79,463	22,023	27.7%
SCE	75,829	17,731	23.4%	75,662	25,206	33.3%
SDG&E	16,164	5,208	32.2%	16,457	7,216	43.8%

RPS Progress Towards 2020 RPS Target



Summary of RPS Procurement Expenditures in 2015

- The weighted average TOD-adjusted RPS procurement expenditure for 2015 was approximately 10 cents/kWh
- RPS procurement expenditures in 2015 are lower than RPS procurement expenditures in 2014
  - RPS expenditures were 10.1 cents/kWh in 2015 versus 10.3 cents/kWh in 2014

	RPS Procurement Percentage	Total Procurement Expenditures($000)	Total RPS Expenditures ($000)	Percentage of RPS Expenditures to Total Procurement Expenditures
PG&E	31.40%	$6,699,711	$2,417,710	36.10%
SCE	24.70%	$5,925,311	$1,580,247	26.70%
SDG&E	36.00%	$1,407,359	$594,314	42.20%

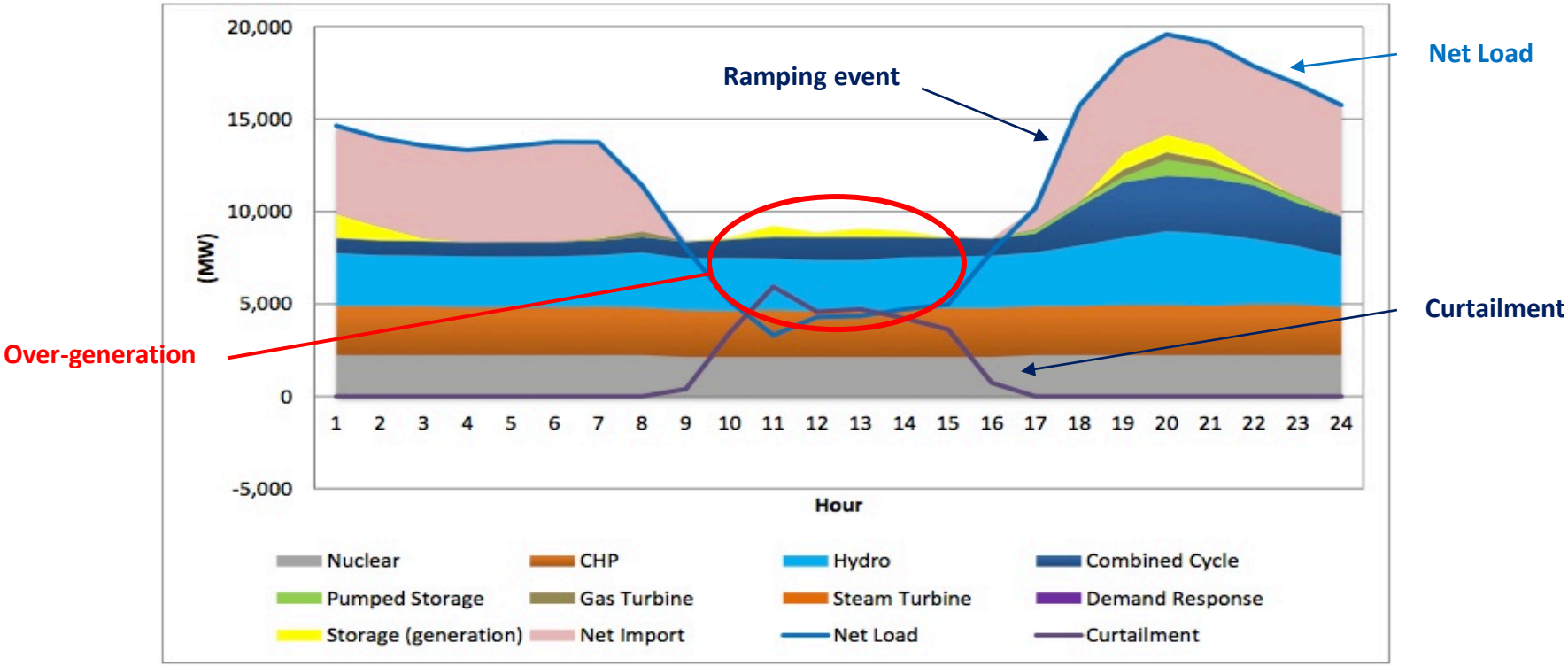
Renewable curtailment

- Studies of higher RPS scenarios predict large amounts of curtailment, especially in scenarios with high proportions of solar
- Balancing the grid in this manner may be undesirable because it wastes renewable energy, undermines RPS and GHG goals, and may be uneconomic compared to other measures that avoid curtailment and balance the grid

Study	Year	RPS	% Curtailed
RPS Calculator v6.0	2030	50%	5.0%
CAISO's 2014 LTPP Testimony	2024	40%	3.4 – 6.5%
CEERT high solar, no enhanced flexibility	2030	55%	9.7%
CEERT diverse, w/ enhanced flexibility	2030	55%	0.2%

These study results depend on many different assumptions about the loads, resources, and operating constraints of the future.

Over-generation and ramping event illustration under a higher RPS in the future



Source: CAISO FRACMOO presentation, Aug 2015, showing potential system conditions for a Spring day in 2024

Grid Integration Solutions

Demand Side (Responsive Load) "Creating Flexible Load"	Supply Side (Responsive Supply) "Increasing Flexibility w/ Procurement"
Storage - customer-side	Storage - supply-side
Demand Response - enhancements to DR, reverse DR to encourage use during oversupply	Demand Response (bidding into CAISO markets)
Distributed generation incentives (NEM, SGIP)	Distributed Renewables (Change curtailment provisions in distributed gen RPS contracts, change in CAISO market to bid in distributed resources)
Distribution grid technologies (Smart-Inverters and Micro-grids)	Transmission grid technologies and markets (EIM, exports, regionalization, targeted TX expansion)
Energy Efficiency targeted to specific times of day	Renewable Procurement Changes (Change Least Cost/Best Fit, integration adder considerations)
Customer Rates (TOU and Dynamic Rate Design) - adjust rates to encourage use at times of oversupply	Wholesale Rates and Market Products (Day-Ahead market changes to reduce self-scheduling)
Load Forecasting (More accurate and granular load shapes through IEPR)	Load Forecasting (Improved day-ahead forecasting of renewables and load)
Transportation Sector (Plug-in Electric Vehicles as responsive load)	Transportation Sector (EVs or charging stations as storage supply)

See also: CPUC Energy Division white paper: Beyond 33% Renewables: Grid Integration Policy for a Low-Carbon Future, November 2015

Components of Integrated Resource Planning (IRP)

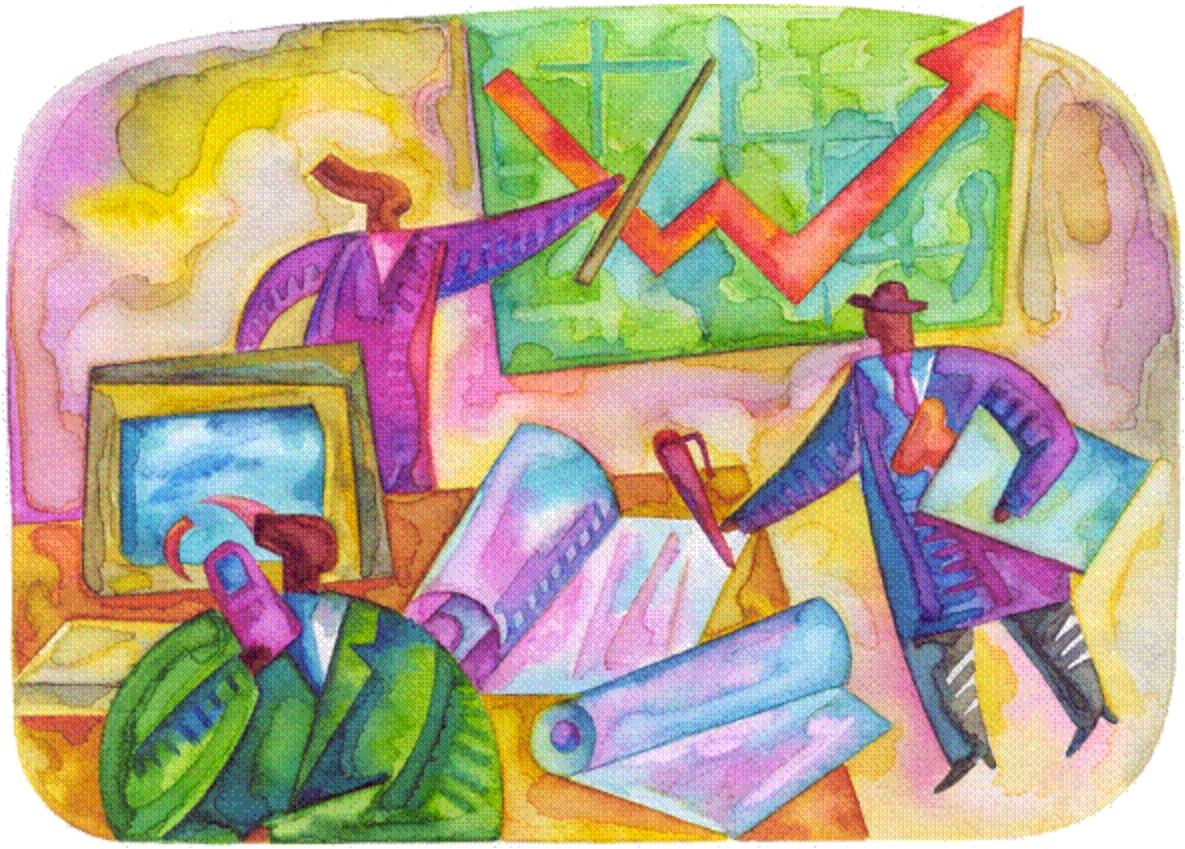
- Standard IRP definition - planning process that considers the costs and benefits of both demand and supply side resources when developing the least total cost mix of utility resource options
- California Focus – IRP will look at both supply side and demand side resources as a means of focusing on GHG emissions and reliability of the utility's portfolio.
- IRP – Fundamental Steps:
  - Develop load forecast for planning horizon (e.g., 10 or 20 years)
  - Determine portfolios of existing/future resources (supply and demand-side) for meeting system need
  - Determine GHG metrics
  - Evaluate cost and risk of candidate resource portfolios: utilize common cost-effectiveness metric
  - Minimize total costs
  - Create a flexible plan that allows for uncertainty and permits adjustment in response to changed circumstances
- Successful IRP process should include both meaningful stakeholder process and oversight from engaged commission

Regular Agenda – Management Reports and Resolutions

Item # 54 [14770]

Management Report on Administrative Activities

Management Reports



The CPUC Thanks You For Attending Today's Meeting

The Public Meeting is adjourned.

The next Public Meeting will be:

May 26, 2016 at 9:30 a.m. in San Francisco, CA