



# California Clean Energy Future

## **Overview and Metric Review**

**IEPR Committee, Joint Agency Workshop**

**CalEPA Headquarters, Sacramento**

**1001 I Street**

**Byron Sher Auditorium, 2nd Floor**

**July 6, 2011**

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# Purpose of Workshop

Stakeholder and public input on two topics:

- Plans to update the *California Clean Energy Future Overview* to reflect:
  - Governor Brown's energy vision.
  - SB x1 2 (Simitian, Chapter 1, Statutes of 2011-12 First Extraordinary Session).
  - Agency updates.
- Whether the agencies have identified the appropriate proposed metrics for measuring progress on the initiatives essential to meeting California's goals.

# California Clean Energy Overview

## ■ Purpose

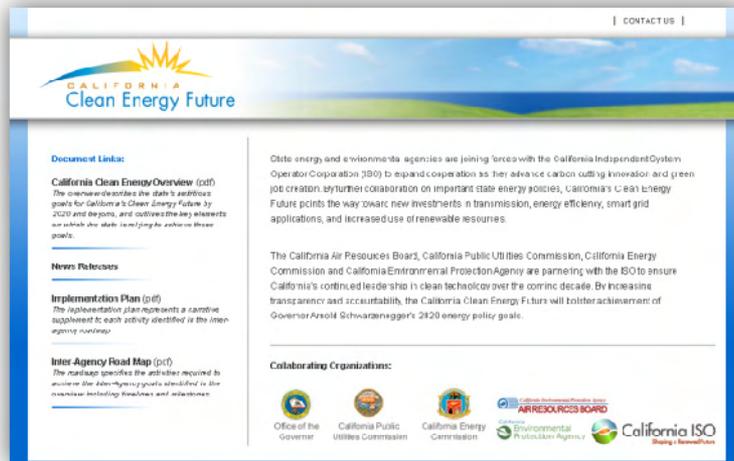
- Compile existing policy goals to support interagency planning and management.
- Identify policy interdependencies and improve communications and cooperation to achieve energy policy goals.
- Use adaptive management practices “to identify policy overlaps, conflicts, unanticipated or unintended consequences, and vulnerabilities in time to make necessary trade-offs and course corrections.” (Overview, p. 2)

## ■ Scope

- Ensure safe, reliable, electricity at reasonable rates with an increased penetration of preferred resources
- Encompass concrete objectives from supply, demand, storage, and transmission
- Statewide, investor-owned utilities and publicly owned utilities
- Focused on 2020, with consideration of 2050 GHG reduction goal

# CCEF Website

- Launched September 21, 2010, includes:
  - Overview is a summary of goals – *one of two topics for today*
  - Roadmap highlights interdependencies
  - Implementation Plan describes current activities, key milestones, interdependencies and delivery risks



[www.cacleanenergyfuture.org](http://www.cacleanenergyfuture.org)

# Tracking and Updating

- The CCEF Overview suggests that the joint agencies review and revise the recommended strategies and specific targets biennially following each demand forecast update.
- The agencies are developing common metrics for ongoing tracking, updating, and reporting of results.
- Regular updates provide an opportunity for identifying any areas that need course correction.

# CCEF Elements

The Overview provides a vision of what the agencies are striving to achieve in the energy sector by 2020

- Demand in 2020
  - Efficiency standards – achieve reductions of 5,000 to 8,100 MW and 800 million therms of natural gas consumption by 2020
  - Demand response – will play a major role in meeting peak power needs
  - Distributed generation – currently calls for 5,000 MW installed by 2020

# CCEF Elements

- Supply in 2020
  - 33% renewables target
    - Maintain operational and reliability needs
    - A significant fraction of the renewables will have dispatch capability
  - Meet environmental goals and ensure reliability
    - Retire, repower, replace, and/or mitigate once through cooling power plants
  - Natural gas generation
    - Thermal fleet will be modified to support renewable integration
  - Carbon capture and storage
    - Targeting the development of at least one utility-scale CCS generation facility in California by 2020

# CCEF Elements

- Transmission, Distribution, & Operations in 2020
  - Transmission planning and permitting advancement
  - Advanced metering and smart grid technologies
  - Energy storage – 1,000 MW of additional storage by 2020
- Additional Supporting Processes
  - Multi-sector state, regional, and/or federal GHG cap-and-trade
  - Emerging technologies
  - Electrification of transportation coupled with a cleaner energy supply – infrastructure for 1,000,000 vehicles by 2020
  - Climate change adaptation
  - Engage and partner with Californian citizens

# Updates to CCEF

The agencies anticipate updating the plan to reflect:

- 33 percent renewables portfolio standard legislation SB x1 2 (Simitian, Chapter 1, Statutes of 2011-12 First Extraordinary Session)
- The goals in the Governor's Clean Energy Jobs Plan, including:
  - 12,000 MW localized energy by 2020
  - 8,000 MW of large-scale renewables and necessary transmission lines
  - Develop 6,500 MW of combined heat and power over the next 20 years

# CCEF Metrics

## Introduction & Overview

- Supplement the Overview and additional CCEF planning documents
- Measure performance
- Indicate opportunities for the agencies to propose course corrections proactively

# CCEF Metrics Metric List & Publication

Seven metrics and four data references will be posted to the public CCEF website.

## Metrics

- Greenhouse Gas Emissions
- Energy Efficiency
- Demand Response
- Renewable Energy
- Installed Capacity
- Transmission Expansion
- Electric Vehicles

## Data References

- Energy Demand
- Reserve Margin
- System Average Rate
- OTC Phase Out Compliance

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# CCEF Metrics

## Stakeholder Questions and Feedback

Among other things, the purpose of this workshop is to get feedback from stakeholders on the relevance and usefulness of the metrics identified.

- As developed the metrics are organized around the CCEF Overview. Is there another or additional organizing principle or policy objective the metrics should be designed around?
  - Energy Action Plan Loading Order
  - Air Resources Board AB 32 Scoping Plan
  - Other
- Are the metrics designed and presented in a way that allows decision makers and the public to understand and track the effectiveness of our policies in achieving the state's policy objectives.
  - How could the metrics and/or their presentation be modified to be more effective for this purpose?
- Are there other metrics that should be included?

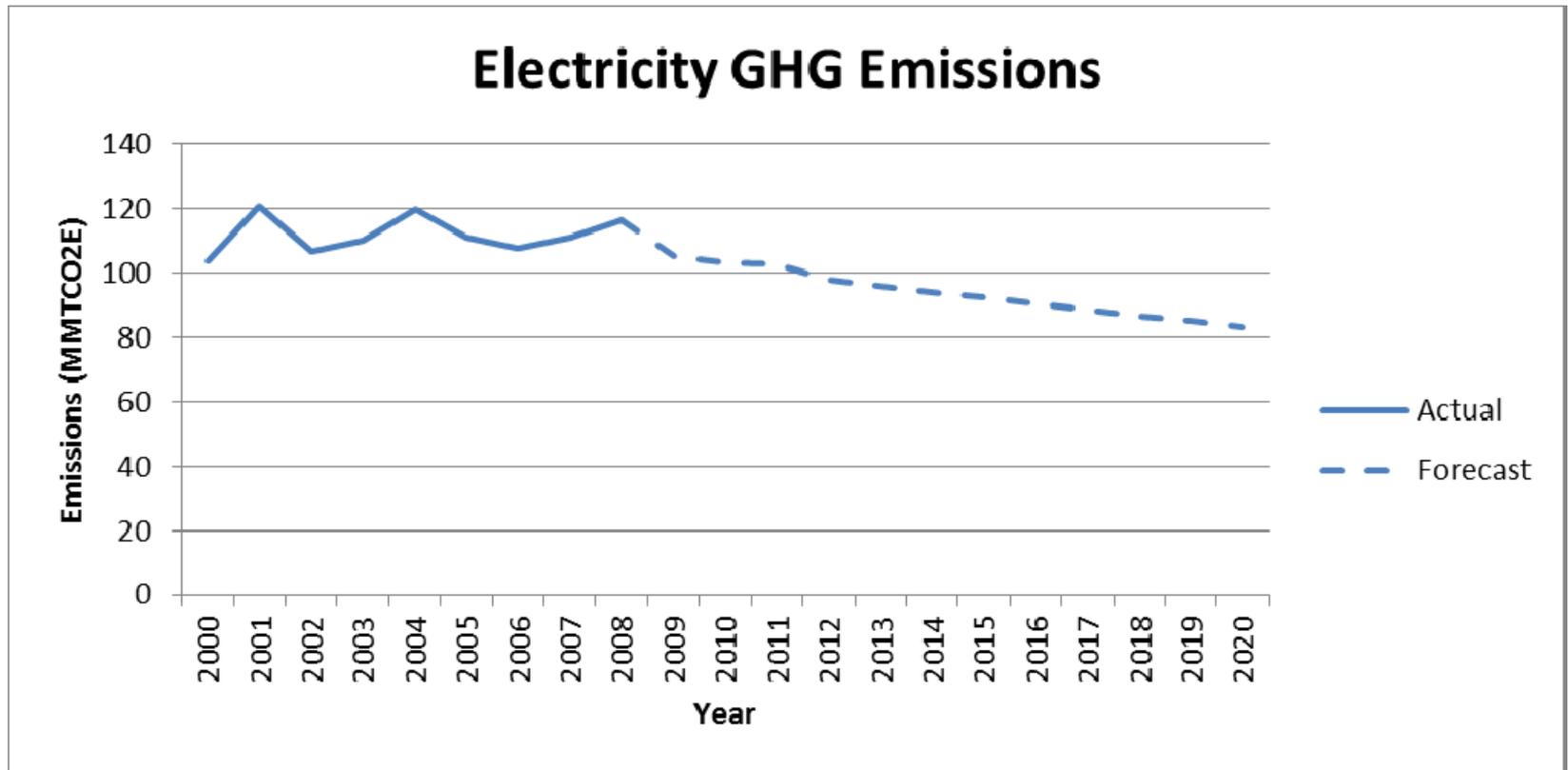
# CCEF Metrics

## Greenhouse Gas Emissions

- Amount of GHG emitted annually by the electricity sector
- 2020 Target Goal: 83 MMT CO<sub>2</sub>e
- Process / Collection Assumptions:
  - Future emission estimates based on projected electricity demand and fuel consumption
  - Tracked by actual emissions reported via Mandatory Reporting

# CCEF Metrics

## Greenhouse Gas Emissions



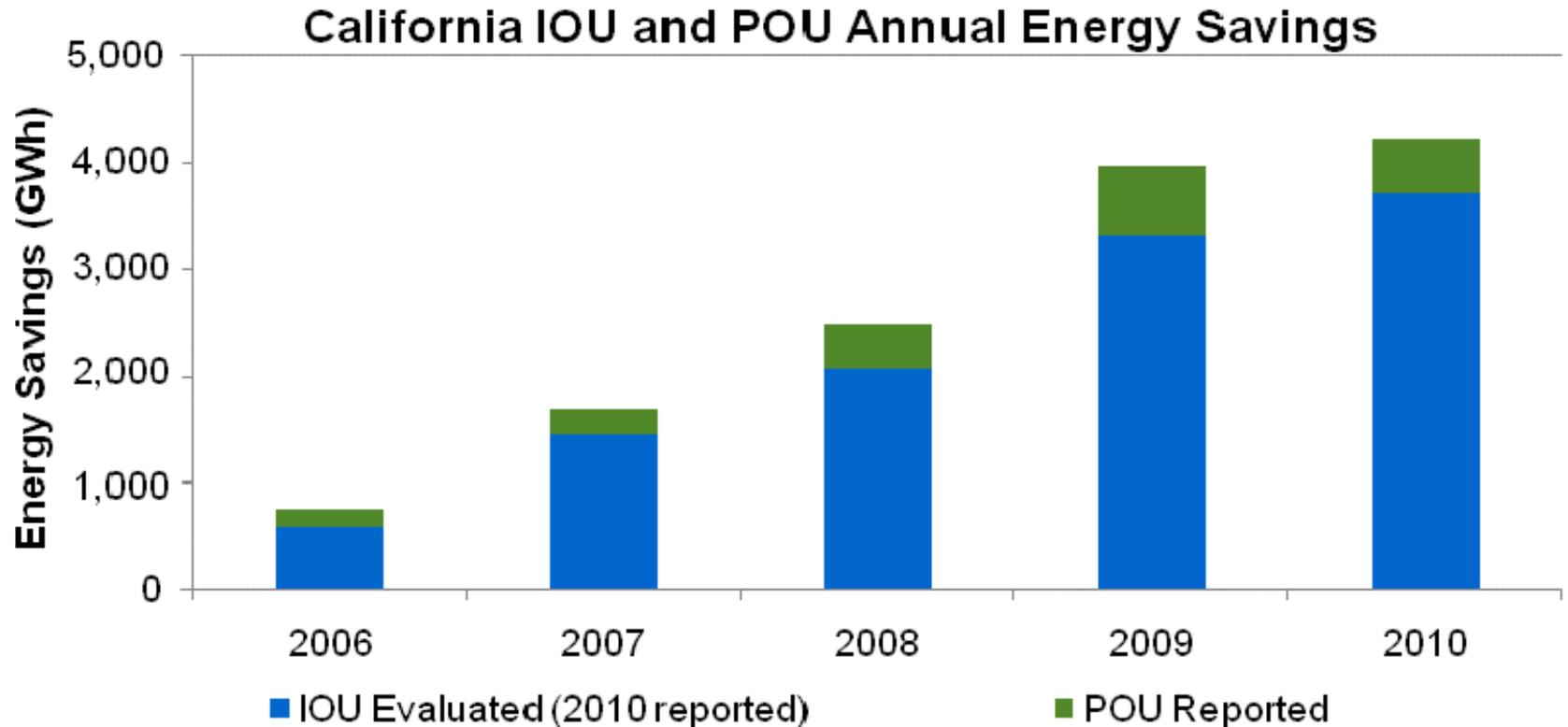
# CCEF Metrics

## Energy Efficiency

- Annual performance compared to goals for electricity savings, peak demand savings for IOUs and POU's. Also, annual performance compared to goals for end-use natural gas savings.
- 2020 Target Goal: 16,298 GWh energy savings, 4,542 MW peak demand savings, and 619 Million Therms end use natural gas savings (Total Market Gross).
- Process / Collection Assumptions:
  - IOU goals are from CPUC Decision 09-09-047, Decision approving 2010 to 2012 Energy Efficiency Portfolios and Budgets.
  - IOU data are from CPUC Energy Efficiency Evaluation reports (2006-2009) and the Energy Efficiency Groupware Application (2010). The data for 2010 have not been evaluated or verified.
  - POU data are submitted to the Energy Commission (AB 2021).

# CCEF Metrics

## Energy Efficiency



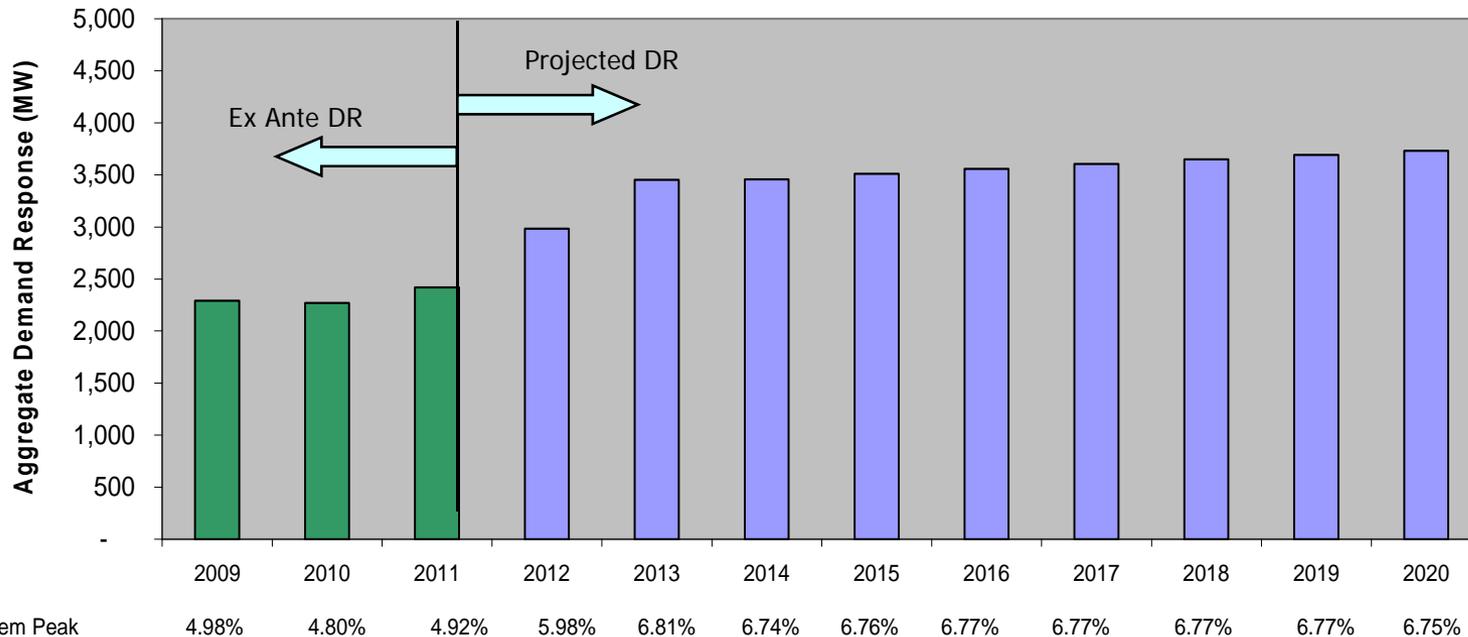
# CCEF Metrics

## Demand Response

- Demand Response (DR) refers to a reduction in a customer's energy usage over a given time interval, typically peak demand periods, relative to what would otherwise occur as a result of a price signal, other financial incentives, or a reliability signal. Because system costs tend to be driven by peak demand, DR represents a valuable load management tool that can provide a cost effective alternative to deploying additional supply side resources during periods of high demand.
- 2020 Target Goal: There is not currently a MW goal, per se, for demand response, though there is high level policy direction, via the Energy Action Plan Loading Order, identifying demand response as a high priority resource. In lieu of a specific goal, the IOUs submit Demand Response Portfolios which are evaluated on the basis of cost effectiveness and other criteria.
- Process / Collection Assumptions:
  - Demand Response capacity based on data provided by CPUC Energy Division and Utility Filings in Resource Adequacy and Long Term Procurement Proceedings.

# CCEF Metrics

## Demand Response



**Source Data:**

- 2009 - 2011 CPUC staff approved numbers based on Commission load impact protocols.
- 2012- 2020 values from April 2011 utility filings in LTPP proceeding.
- System Peak for 2009 and 2010 from CPUC's 2009 and 2010 Resource Adequacy Reports; see <http://www.cpuc.ca.gov/PUC/energy/Procurement/RA/>
- System Peak for 2011 - 2020 from CEC 2009 IEPR. See Total CAISO Coincident System Peak <http://www.energy.ca.gov/2009publications/CEC-200-2009-012/CEC-200-2009-012-CMF.PDF>

# CCEF Metrics

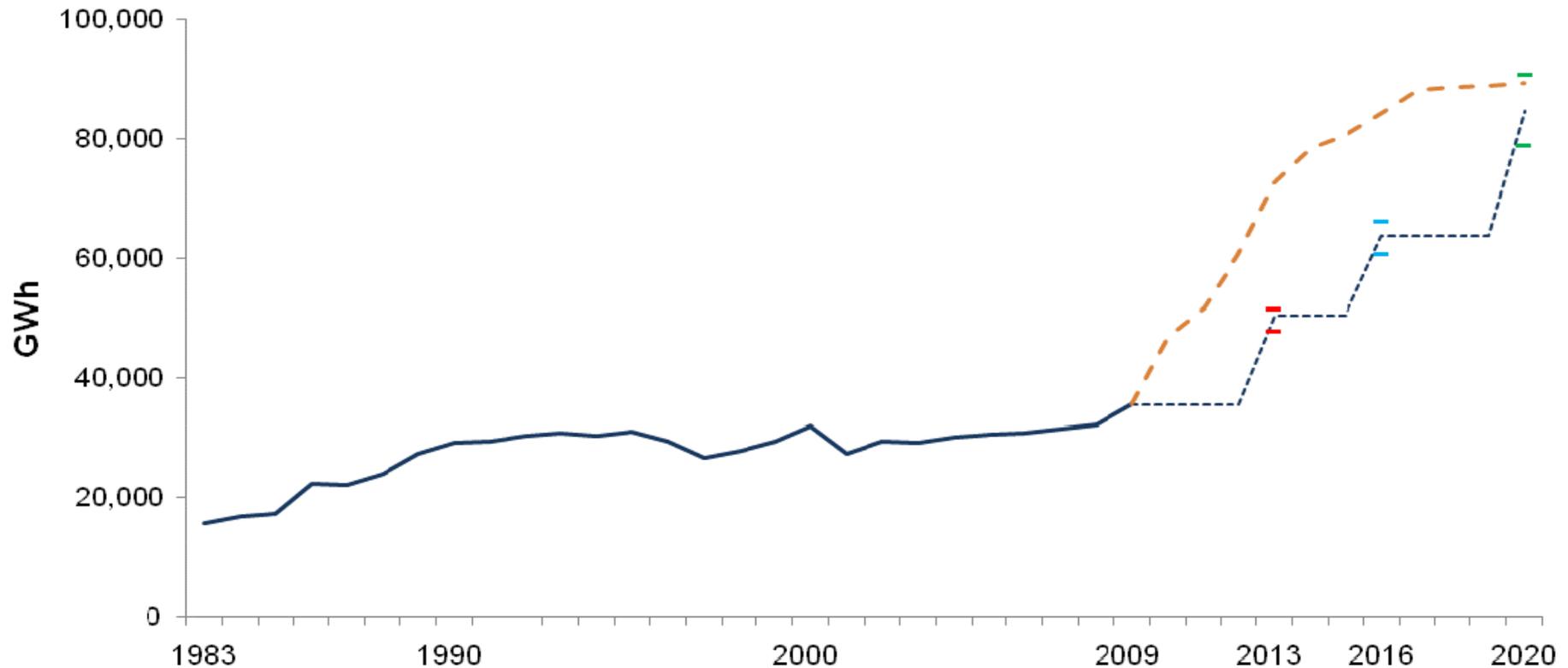
## Renewable Energy

- Historical renewable energy for California compared to statewide RPS targets for 2013, 2016, and 2020.
  - The metric also shows total minimum energy under signed IOU and POU RPS contracts.
  - Additional graphs show the portion of signed contracts that have achieved the following milestones: securing financing, obtaining necessary permits, beginning construction, and commencement of commercial operations.
- 2020 Target Goal: 33 percent of retail sales procured from eligible renewable energy resources. (SBx1 2)
  - State law also sets interim targets: 20 percent by 2013 and 25 percent by 2016.
- Process / Collection Assumptions:
  - Data are for the year generated, using total system power data collected by the Energy Commission through Quarterly Fuel and Energy Reports (PRC 1304) and SB 1305 (PRC 1394). Retail sales are from the adopted Energy Commission Demand Forecast. Estimated targets are from the Energy Commission based on the renewable net short methodology. IOU RPS contracts (approved and pending) from the CPUC. POU RPS contracts from the Energy Commission's POU contract database.

# CCEF Metrics

## Renewable Energy

Renewable Generation for California and RPS Goals

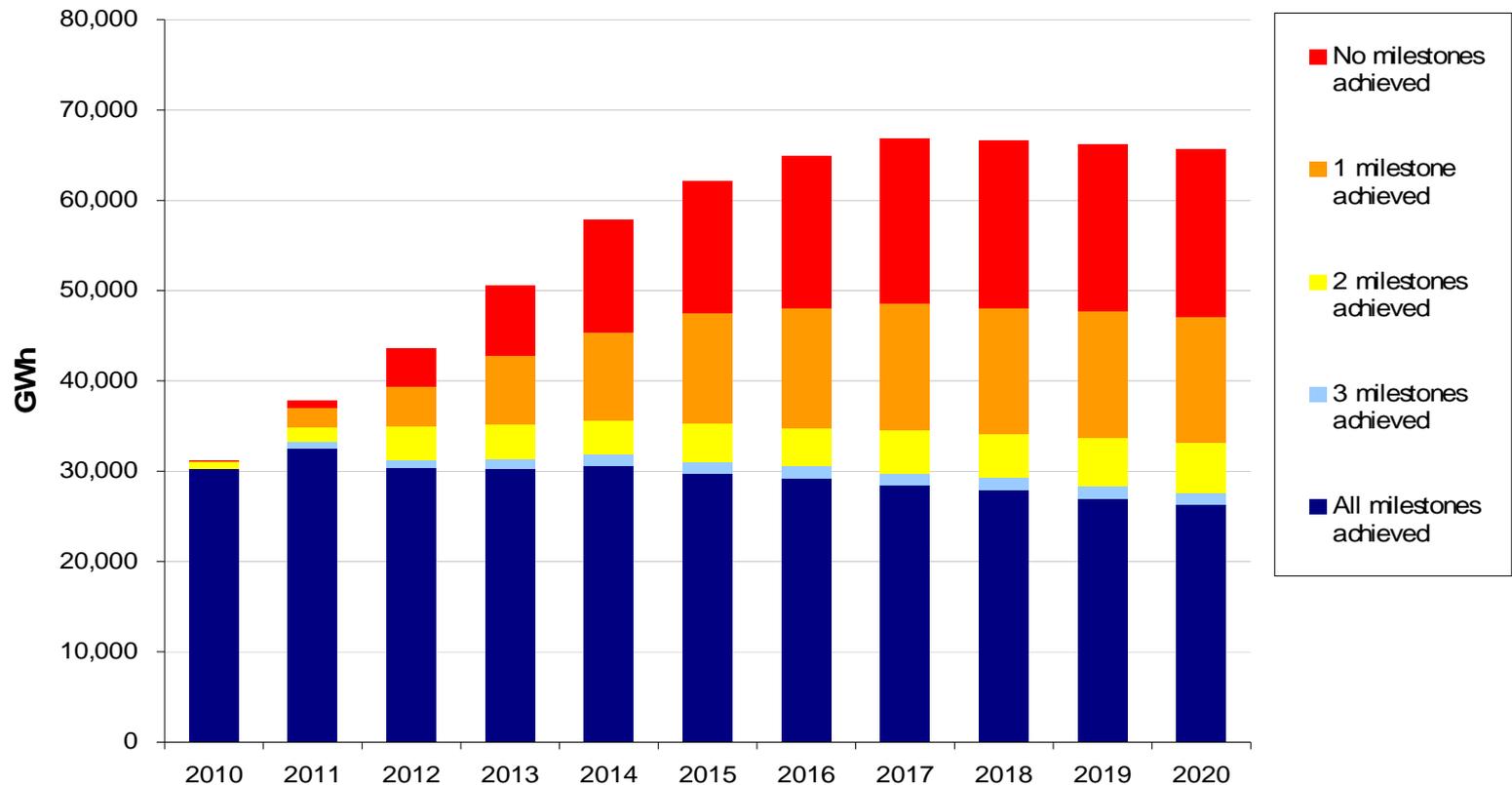


— Renewable generation and forecasted targets — 20% — 25% — 33% — IOU (approved, pending) and POU contracts

# CCEF Metrics

## Renewable Energy

### Milestones Achieved by Executed IOU RPS Contracts



# CCEF Metrics

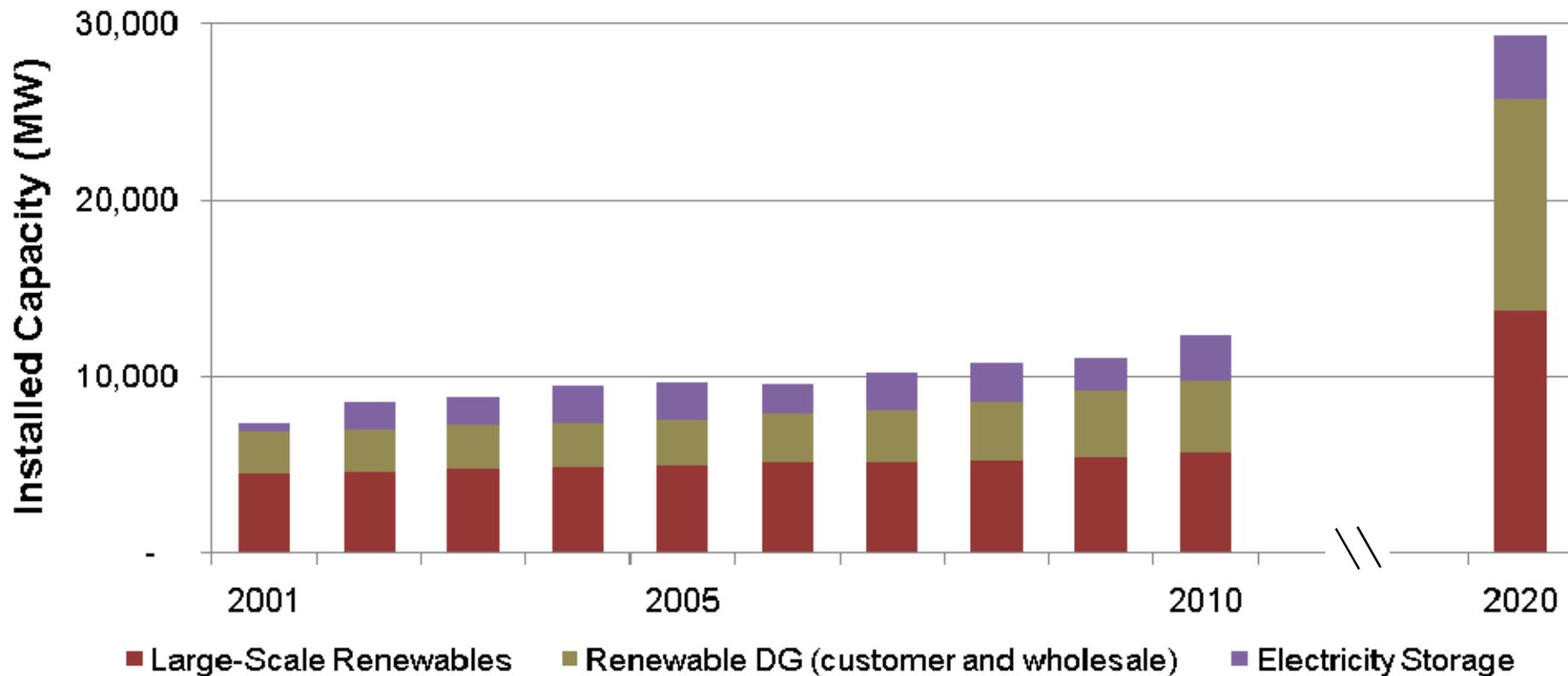
## Installed Capacity

- Historical installed nameplate capacity for conventional and renewable resources, including self-generation photovoltaic systems.
  - The metric compares installed capacity to goals for renewable resources, combined heat and power, and energy storage.
- 2020 Target Goal: Adding 8,000 MW of utility-scale renewable resources, 12,000 MW of renewable distributed generation (DG), and 1,000 MW of energy storage. The metric also includes a goal of adding 6,500 MW of combined heat and power in 20 years.
- Process / Collection Assumptions:
  - Energy Commission Quarterly Fuels and Energy Reports (QFER).
  - Energy Commission Renewables Portfolio Standard Eligibility Database.
  - Self-generation DG data sources: New Solar Homes Partnership, Emerging Renewables Program, CPUC California Solar Initiative, Publicly Owned Utilities' SB1 Solar Program Status Reports.

# CCEF Metrics

## Installed Capacity

**Governor's Goals for Large-Scale Renewables and Renewable DG (20 MW and Smaller) and CCEF Goal for Storage**



# CCEF Metrics

## Transmission Expansion

- Transmission in place to achieve state renewables goals
- 2020 Target Goal: 33% Renewables Portfolio Standard
- Process / Collection Assumptions:
  - Initial reporting based on ISO requirements – will be expanded to include non-ISO entities.
  - ISO “share” of net short requirements is a pro-rata share based on electric load served.

# CCEF Metrics

## Transmission Expansion



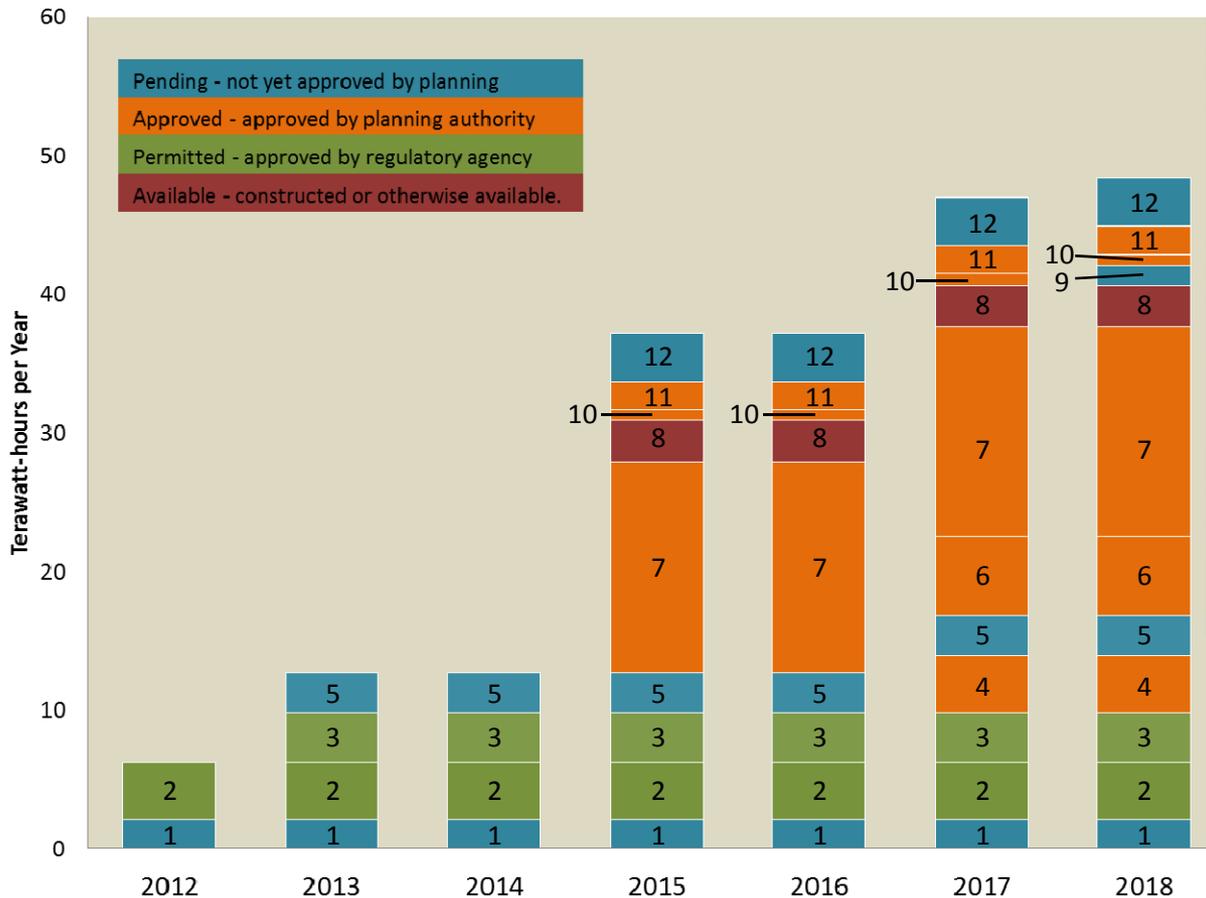
Data reflects ISO Planning Authority; final version will include non-ISO California Planning Authorities.

Transmission upgrade	Approval status		Renewable Potential		Online
	ISO	CPUC	MW	TWh/Yr	
<b>1</b> Carrizo-Midway	Pending LGIA	Not yet filed	900	2.1	2012
<b>2</b> Sunrise Powerlink	Approved	Approved	1,700	4.1	2012
<b>3</b> Eldorado-Ivanpah	LGIA	Approved	1,400	3.6	2013
<b>4</b> Pisgah-Lugo	LGIA	Not yet filed**	1,750	4.1	2017
<b>5</b> Valley-Colorado River	Approved	Approved*	4,700	8.6	2013
<b>6</b> West of Devers	LGIA	Not yet filed			2017
<b>7</b> Tehachapi	Approved	Approved	4,500	15.2	2015
<b>8</b> Tehachapi Wind/Solar Diversity	N/A	N/A	1,000	3.0	2015
<b>9</b> Cool Water-Lugo	Pending LGIA	Not yet filed	600	1.4	2018
<b>10</b> South Contra Costa	LGIA	Not yet filed	300	0.8	2015
<b>11</b> Borden-Gregg	LGIA	Not yet filed	800	2.0	2015
<b>12</b> Path 42	Approved	Not yet filed	1,400	3.5	2015
Other-Outside of ISO Grid	N/A	N/A	3,300	8.4	
<b>Total</b>			<b>22,350</b>	<b>56.8</b>	
<b>TWh/year needed in ISO area to meet 33% goal:</b>				<b>44</b>	

# CCEF Metrics

## Transmission Expansion

### Capability of Transmission Projects



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	ISO	CPUC	MW	TWh/Yr	
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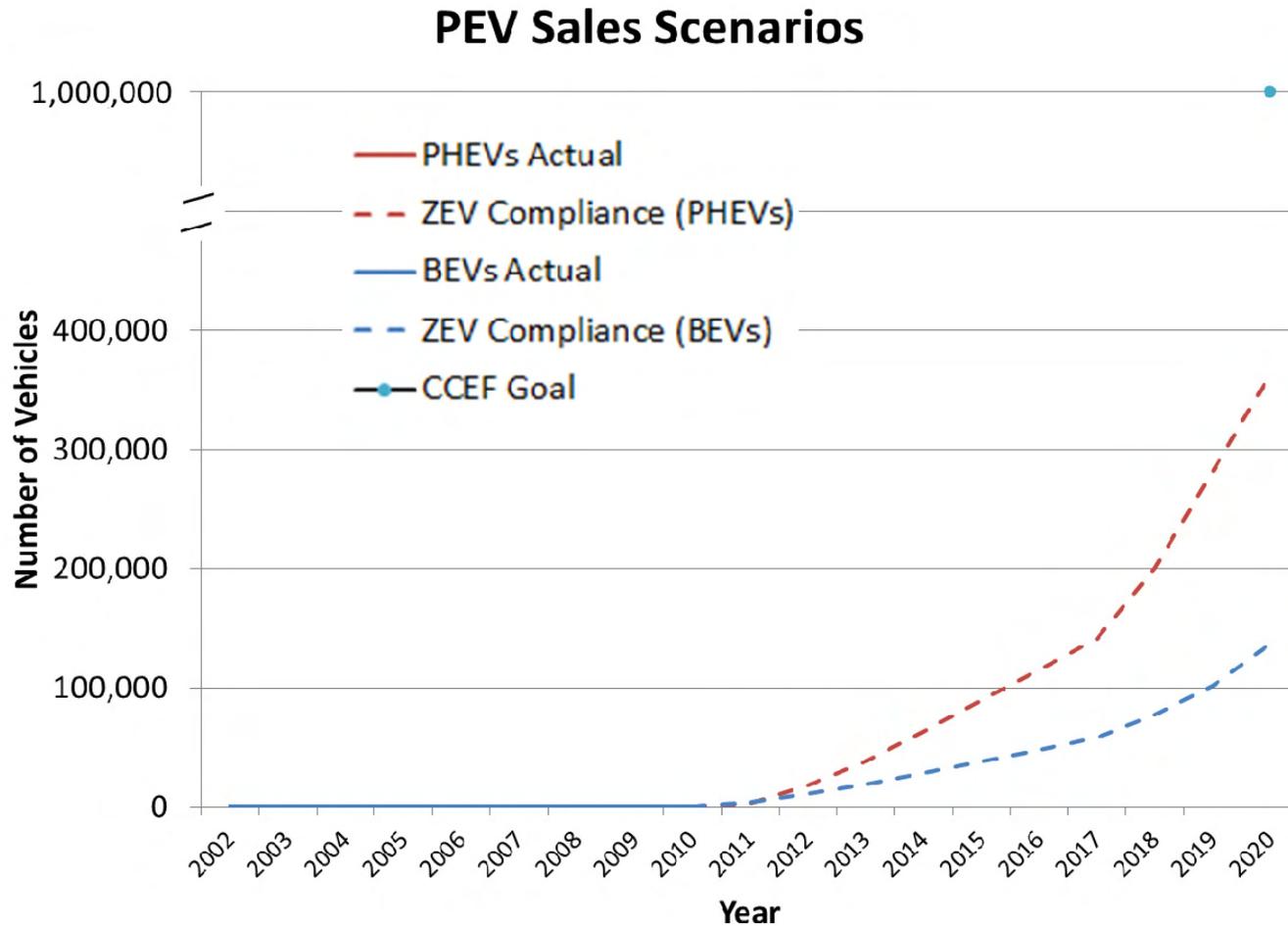
# CCEF Metrics

## Plug-In Electric Vehicles

- The cumulative number of plug-in electric vehicles sold in CA
- 2020 Target Goal: Infrastructure and operational capabilities necessary to absorb a targeted 1 million fully electric and plug-in hybrid-electric vehicles by 2020
- Process / Collection Assumptions:
  - Two categories of plug-in electric vehicles: plug-in hybrids and battery
  - Plug-in electric vehicle sales/leases used to comply with Zero Emission Vehicle regulation
  - Monitored by yearly auto manufacturer reporting

# CCEF Metrics

## Plug-In Electric Vehicles



# Discussion Questions

## Overview Document

1. The Overview provides a high-level roadmap for California's existing energy goals. The agencies plan to publish metrics to indicate the status of work to achieve the goals in the Overview. Do you have other suggestions on how the agencies can achieve the Overview goals in a transparent and effective way?
2. The California Clean Energy Future Overview was drafted in September, 2010 and the agencies plan to update it to reflect the Governor Jerry Brown's Leadership in energy policy, the passage of Senate Bill 1X2, codifying that 33 percent of retail sales of electricity be served by renewable resources by 2020, other new significant legislation, and agency updates. Which new legislation and agency updates should be included in the update of the California Clean Energy Future Overview?
3. The agencies plan to review and revise the recommended strategies and specific targets of the California Clean Energy Future "on a biennial basis following each demand forecast update provided by the Energy Commission's *Integrated Energy Policy Report*." (page 2) Please comment on whether this is the right frequency and venue for review. If you have other suggestions, please provide the rationale for your recommendation.

## Metric

4. Are these the right metrics to track progress towards achieving the policies reflected in the Overview? In addition to the CCEF overview are there other organizing principles or policy objectives the metrics should be designed around, for example, a more express focus on the role different programs play in facilitating the state's GHG goals pursuant to AB32 and the scoping plan? The Energy Action Plan Loading Order? Other?

# Discussion Questions

5. Is the presentation of the metrics effective in conveying relevant information to policymakers and/or the public regarding the effectiveness of our policies in achieving the state's policy objectives? How could the metrics and/or their presentation be modified to be more effective for this purpose?
6. Are there specific additional metrics that should be added or removed? For example, should there be a metric for the state's ability to maintain reliability of the electric grid with high levels of renewables (e.g., ramping needs versus availability)? Should other indicators such as health or job creation be added? If you recommend adding a metric, please also propose a methodology for measurement and the rationale for your recommendation.
7. For each metric, please provide comments on the methodology used to provide data. For example, are there better data sources that staff should use?
8. Regarding the metric for electricity sector greenhouse gas emissions and emissions intensity, should the graphs include a line representing the business as usual case?
9. For renewable energy, the metric includes a graph showing the portion of signed IOU RPS contracts that have achieved the following milestones: securing financing, obtaining necessary permits, beginning construction, and commencement of commercial operations. Staff would like to include a similar graph for signed POU RPS contracts, is the information available?
10. Staff plans to update the metrics once a year. Is this an appropriate rate of updating the data? Are some data updated more frequently? Less frequently?

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