



# California's Renewable Energy Program

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*RENEWABLE  
ENERGY  
PROGRAM*

CALIFORNIA ENERGY COMMISSION



# Renewable Energy in California



- For decades, California led the country and the world in renewable energy procurement
- From its peak in early 1990s, renewable generation declined amid market uncertainties
- In 1996, AB 1890 placed a surcharge on electricity sold by investor-owned utilities to be used to fund public interest programs, including renewable energy
- The Energy Commission designed the **Renewable Energy Program**, a financial incentive mechanism to support renewable development in a market environment
- This method for supporting renewables, however, was impacted by the energy crisis of 2000 and 2001

# From the Energy Crisis to the Renewables Portfolio Standard



California's move to a restructured electricity market and resultant energy crisis prompted policymakers to pursue a new method to encourage development of renewable power:

## **Renewables Portfolio Standard**

# Further Emphasis to use Renewable Resources to Meet California's Energy Needs

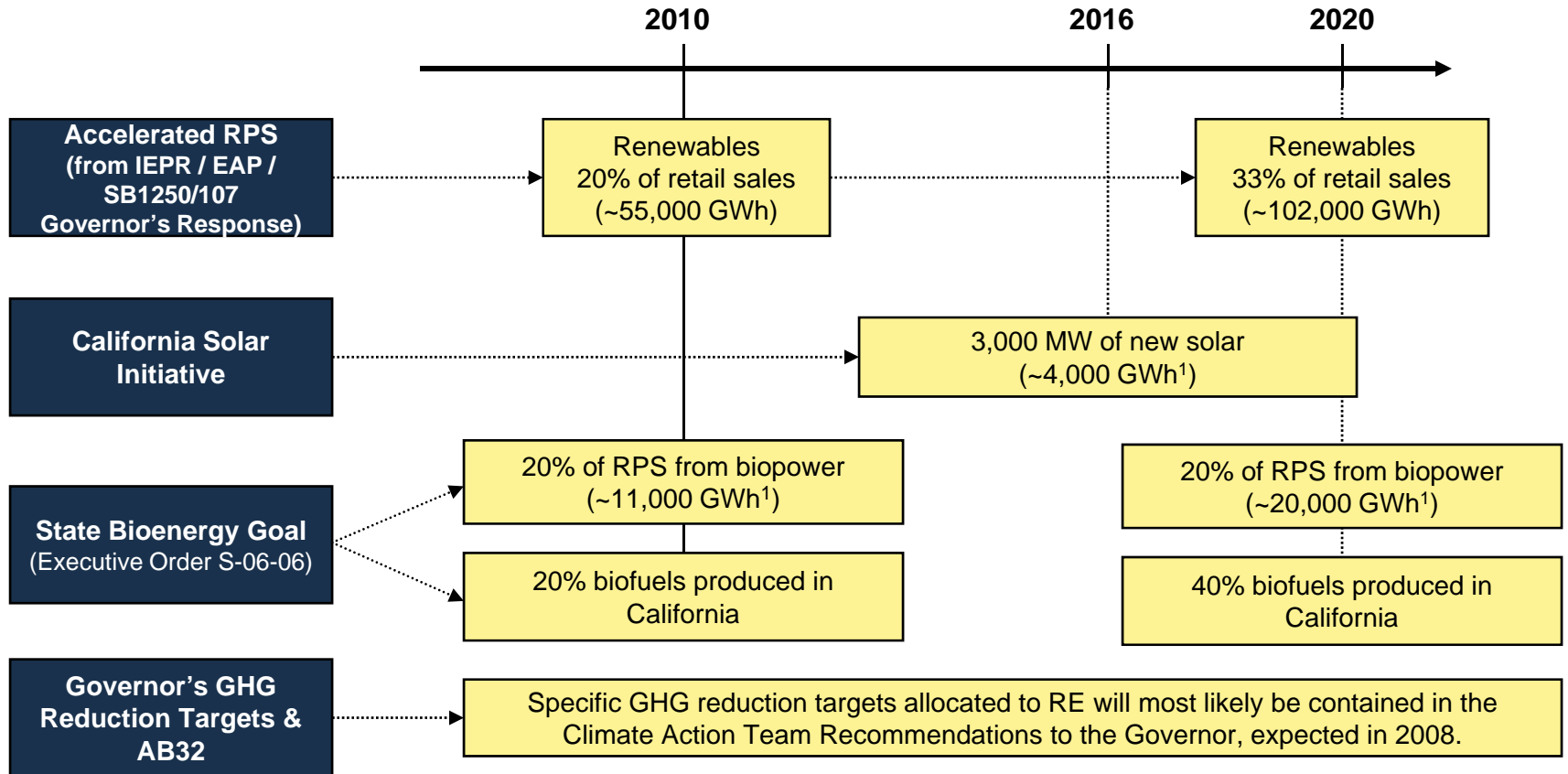


- California's *Energy Action Plan* identified top priorities in the loading order policy for electricity:
  - Increasing energy efficiency and demand response
  - Meeting new generation needs first with **renewable** and distributed generation resources.
- Governor Schwarzenegger's energy policy promotes adequate, affordable and reliable energy supplies and technologies that protect and improve economic and environmental conditions. He strongly supports the *Energy Actions Plan's* loading order.
- Greenhouse gas reduction goals, enacted in AB 32, add to the importance of achieving renewable targets and to managing the costs and risks to ratepayers.

# Key CA Renewable Energy Policies



## Key Renewable Energy Policy Impacting California

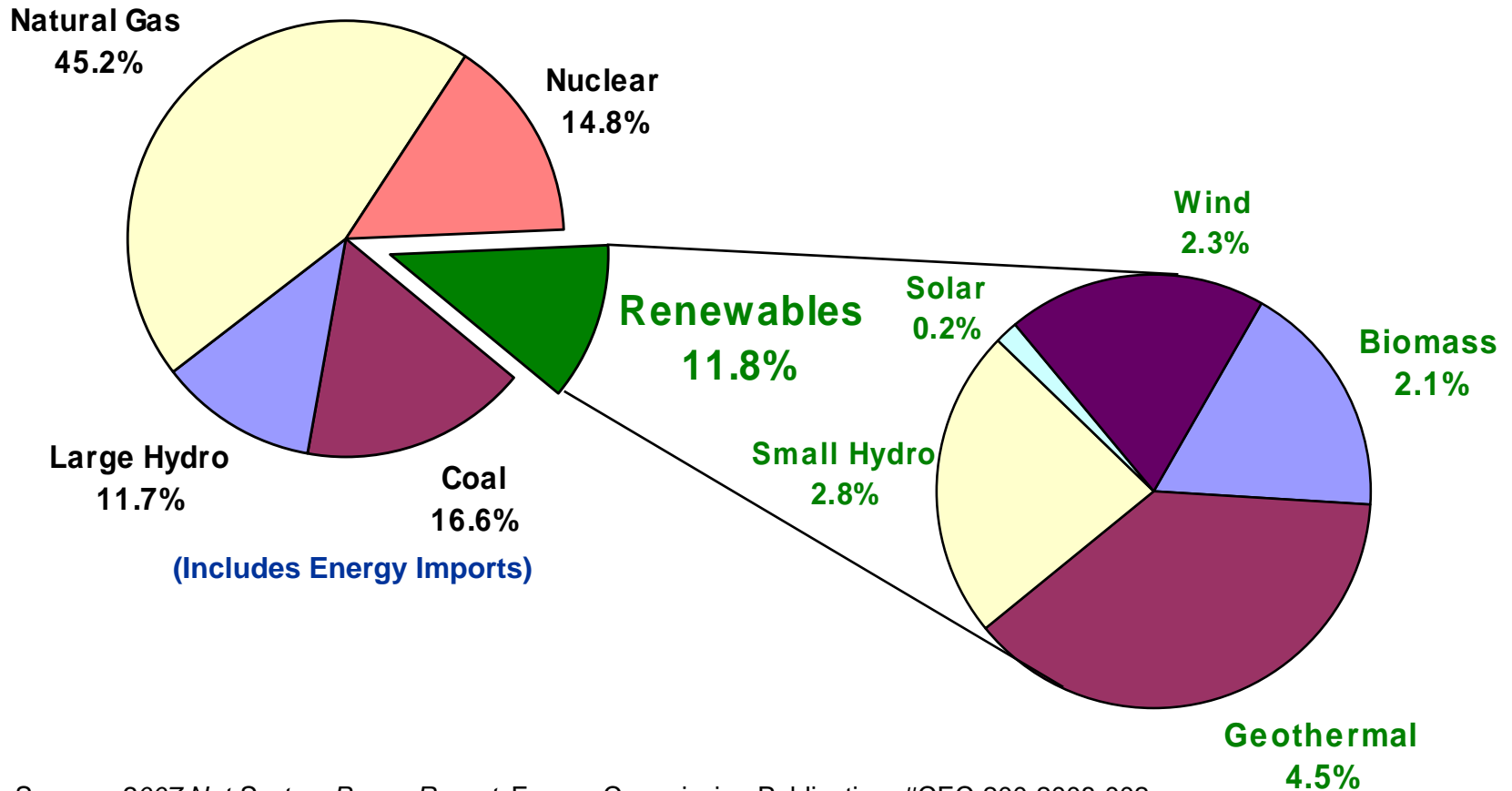


<sup>1</sup> Assumes average capacity factors are 15% for solar and 90% for biopower.  
 Note: The roadmap also considered detailed policy guidance as stated in the IEPR.

# California's Electricity Supply in 2007



## In-State Generation and Estimated Energy Imports by Fuel Type



Source: 2007 Net System Power Report, Energy Commission Publication, #CEC-200-2008-002, .  
<http://www.energy.ca.gov/2008publications/CEC-200-2008-002/CEC-200-2008-002.PDF>.

Totals may not sum due to rounding.

# Renewable Energy Program Goals



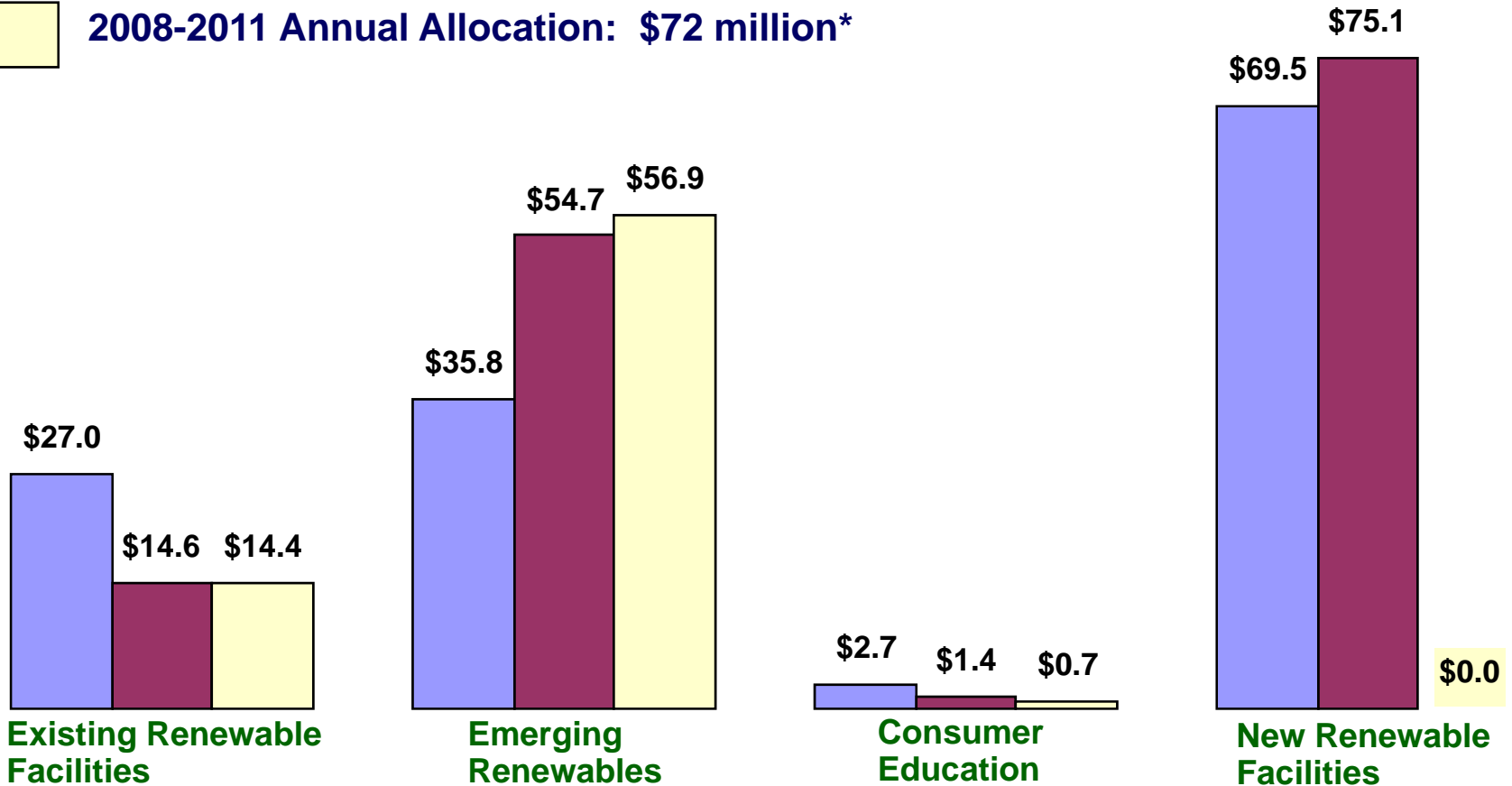
**Goal: Achieve a self-sustaining renewable energy supply for California.**

- Optimize public investment and ensure that the most cost-effective and efficient investments in renewable resources are vigorously pursued.
- Increase the quantity of California's electricity generated by renewable resources, while protecting system reliability, fostering resource diversity, and obtaining the greatest environmental benefits to the state.
- Identify and support emerging renewable energy technologies with the greatest near-term commercial promise that merit targeted assistance.

# Annual Allocation of Program Funds 2002 - 2011



- 2002-2006 Annual Allocation: \$135 million\*
- 2007 Annual Allocation: \$145.8 million\*
- 2008-2011 Annual Allocation: \$72 million\*



\*The total amount collected each year is adjusted annually at a rate equal to the lesser of the annual growth in electric commodity sales or inflation, as defined by the gross domestic product deflator.

# New Renewable Facilities Program



**Goal: Accelerate the addition of new renewable capacity to meet California's growing demand for electricity.**

- Production incentives for proposed “new” in-state renewable generating facilities allocated to lowest bidders during 3 competitive solicitations conducted in 1998, 2000, and 2001.
- Incentives paid over a 5-year period once project began generating electricity.
- Incentives capped at 1.5 cents per kilowatt-hour
  - 47 projects completed and producing electricity representing 488 MW of capacity.
  - More than \$73 million in incentive payments has supported about 8,133 gigawatt-hours of generation.

# New Renewable Facilities Program



## SB 1036 direction:

- New Account abolished effective July 1, 2008.
- Energy Commission must terminate production incentives awarded prior to 1/1/02 for projects not online by 1/1/07 - *Completed*
- By March 1, 2008, Energy Commission must transfer New Account's remaining unencumbered balance back to electrical corporations serving customers subject to the renewable energy Public Goods Charge (Pacific Gas and Electric Company, San Diego Gas and Electric, Southern California Edison, and Bear Valley Electric) - *Completed*

# Existing Renewable Facilities Program



**Goal: Encourage economic viability of existing renewable projects.**

- Provides production incentives to existing renewable generation facilities
- Payments tied to market prices
- Eligible technologies: solid-fuel biomass, solar thermal, wind
  - Has helped 273 existing renewable facilities remain competitive or return to service by paying more than \$257 million for 4,400 MW of renewable energy capacity.
  - Provided \$6 million for 2004 Agriculture-to-Biomass Program to improve air quality in CA's agricultural areas.

# Existing Renewable Facilities Program



- Beginning 2007, under SB 1250 program structure, facilities must reapply for funding
- Applications must include project-specific target price request and cent/kWh cap on funding for energy produced in a calendar year
  - For calendar year 2007 generation:
    - 30 applications approved
    - \$18.1 million paid for 3,261 GWh

# Emerging Renewables Program



**Goal: Reduce costs and accelerate market acceptance through high volume production of emerging renewable technologies.**

- Provides rebates for purchasing and installing eligible renewable energy systems to offset electricity needs at homes or businesses.
- Reduces up-front costs for customers.
- Through 2006, eligible technologies were solar photovoltaic, small wind, fuel cells using renewable fuels, solar thermal electric. Effective 1/1/07, only small wind and fuel cells eligible because solar component replaced with California Solar Initiative.
  - Provided \$396 million for distributed PV and wind energy systems installed on 27,696 homes and businesses, providing 123 MW of capacity.
  - Encumbered \$30 million for 2,476 additional systems under construction, to provide 11.4 MW.

# California Solar Initiative



**GOAL: Move California toward a cleaner energy future by creating a sustainable solar market in California.**

## Beginning 2007:

- California Solar Initiative, largest solar program of its kind in the country, part of Governor Schwarzenegger's Million Solar Roofs Initiative
- \$3.35 billion effort by CPUC, CEC, and publicly owned utilities
- Residential and nonresidential customers
- 3,000 MW combined public/investor-owned utilities goal
- Solar industry self-sufficiency in 10 years
- Emphasis on energy efficiency
- High performance installations

# California Solar Initiative



## California Solar Initiative

### CPUC Program

Commercial,  
Industrial, Existing  
Residential

**\$2 Billion\***

### CEC Program

New Residential  
Construction  
(NSHP)

**\$400 Million**

### Publicly-Owned Utility Programs

Eligibility  
Requirements  
under Development

**\$784 Million**

\*Additional \$100 Million for Solar Thermal and Solar Water Heaters plus  
\$50 Million for Solar R&D



# New Solar Homes Partnership

## GOALS:

- ❖ 400 MW installed capacity by end of 2016
- ❖ All solar systems must be highly energy efficient and high performing
- ❖ Solar on 50% of new homes

- Incentive of ~\$2.50/watt or more based on expected performance
- Provides assistance to builders
- Requires 15% higher energy efficiency than state building standard (Title 24)
- New residential construction only: New Homes/ Developments, Affordable Housing
- To date, 234 applications received for 3,981 systems

# Consumer Education Program



## GOALS

- ❖ Raise consumer awareness about renewables and their benefits
- ❖ Increase purchases of emerging technologies
- ❖ Develop renewable energy education partnerships
- ❖ Track and verify renewable energy procurement

- Provides information to California consumers to help build a market for renewable energy.
- Supports market development of emerging renewables technologies.
  - Provided over \$7 million for market research, 21 outreach and demonstration grant projects, and 3 public awareness campaign contracts.

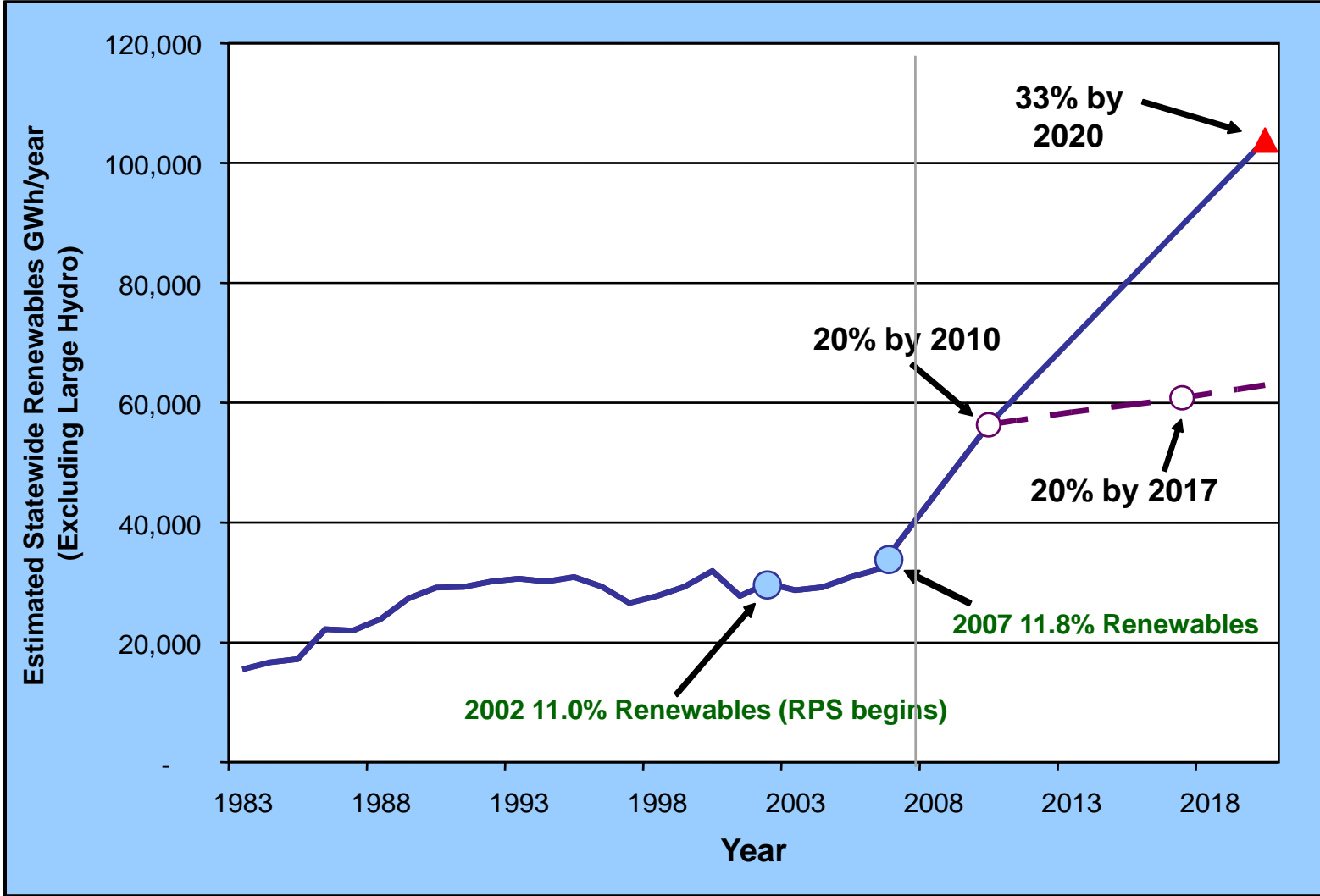
# California's Renewables Portfolio Standard



**Goal: To increase the diversity, reliability, public health, and environmental benefits of California's energy mix.**

- RPS signed into law in 2002 assigning roles to Energy Commission, CPUC, and publicly owned utilities.
- Current legislative goal of 20% of retail sales from renewables by 2010, with increase by at least 1% per year.
- The Governor, the Energy Commission, and the CPUC endorsed an enhanced goal of 33% renewables by 2020 for the state as a whole.

# California's Renewable Energy Goals





## CEC ROLE

- **Certify renewable facilities as eligible for the RPS**
- **Design and implement accounting system to track and verify RPS compliance**
- **Distribute Supplemental Energy Payments (Legislation deleted CEC authority to award SEPs and transfers administrative responsibility to CPUC)**

## CPUC ROLE

- Oversight of IOU procurement:**
- **Approve procurement plans**
  - **Set baselines and targets**
  - **Develop market price referent**
  - **Develop least-cost-best-fit process to evaluate bids**
  - **Set rules for flexible compliance**
  - **Standardize contract terms**
  - **Approve/ reject contracts**
  - **Ensure RPS competitiveness**
- Oversight for other “retail sellers”**



# RPS Eligible Technologies

- Biomass
- Biodiesel
- Conduit hydro
- Fuel cells using renewable fuel
- Digester gas
- Geothermal
- Landfill gas
- Municipal solid waste conversion
- Ocean wave, ocean thermal, tidal current
- Photovoltaic
- Small hydro
- Solar thermal electric
- Wind



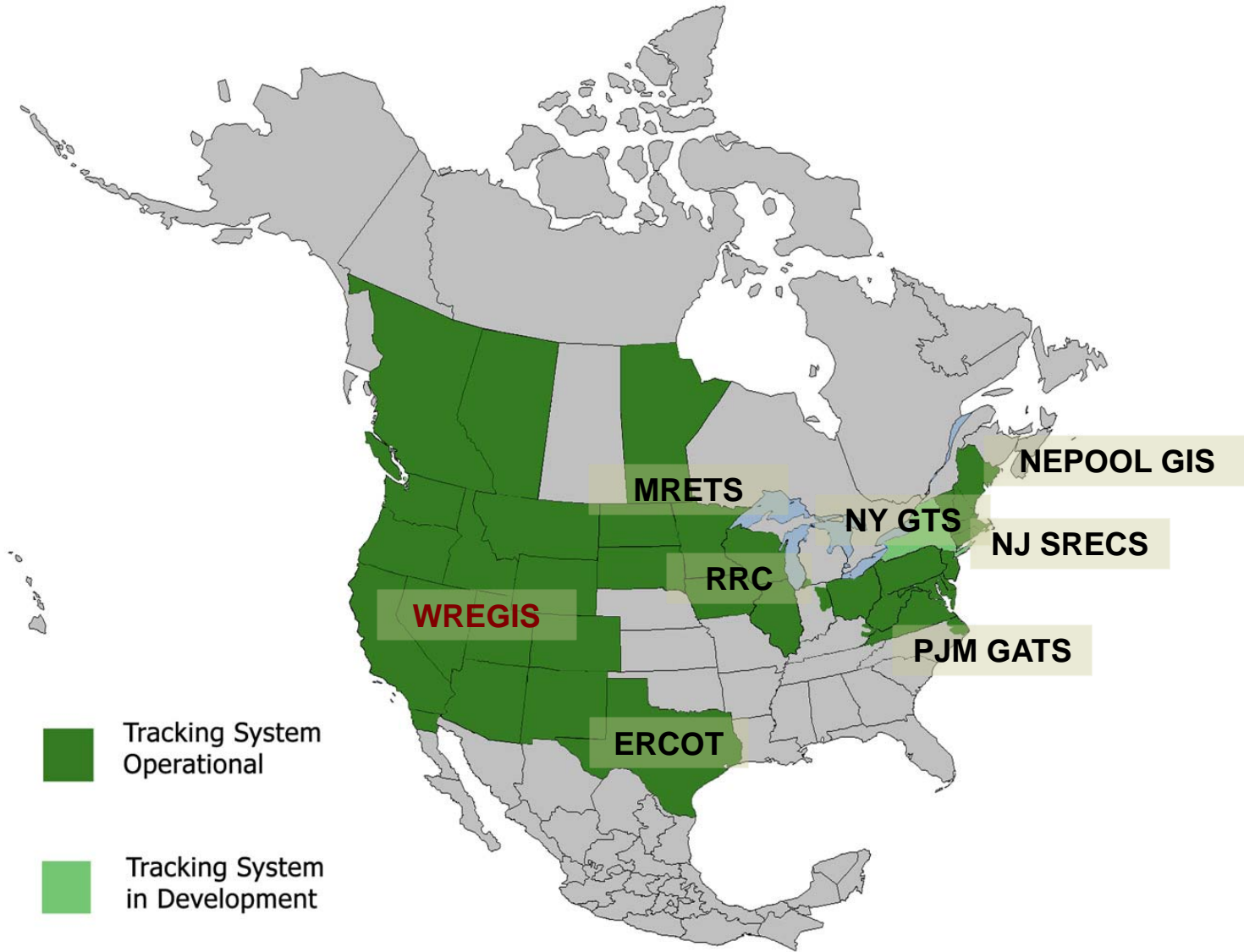


# What is WREGIS?

## Western Renewable Energy Generation Information System

- A voluntary, independent renewable energy registry and tracking system for the Western Interconnect region
  - Uses verifiable renewable energy generation data
  - Creates renewable energy certificates (WREGIS certificates)
  - Accounts for transactions involving certificates
  - Supports voluntary and regulatory markets for certificates
- WREGIS launched June 2007
- Most retail sellers and renewable facilities participating in the California RPS are required to register with and use the WREGIS by January 1, 2008.
- PG&E, SCE, and SDG&E received an extension and are not required to register with WREGIS until May 1, 2008.

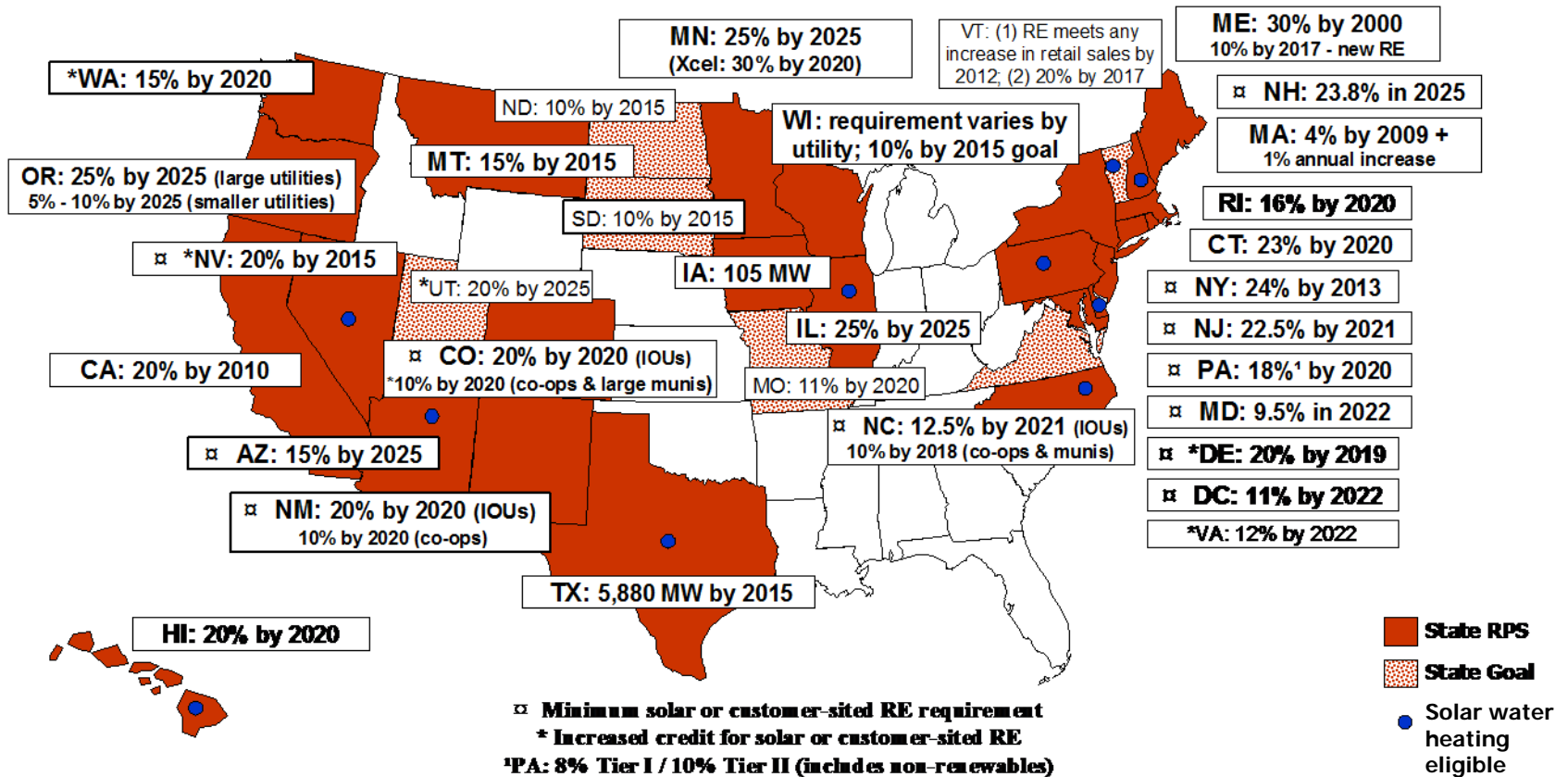
# Attribute Tracking Systems





# Renewables Portfolio Standards Nationwide

## 26 states have mandatory RPS



Source: DSIRE:www.dsireusa.org, March 2008.

# IOU RPS Contracts by Technology (MW)



	<b>PG&amp;E</b>	<b>SCE</b>	<b>SDG&amp;E</b>	<b>Total</b>
<b>Wind</b>	531	2,019 – 2,387	357	2,907 – 3,275
<b>Biogas</b>	9 – 99	12 – 13	24	45 – 136
<b>Biomass</b>	105 – 125	44 – 69	84	232 – 277
<b>Geothermal</b>	435 – 570	335 – 545	60	830 – 1,175
<b>Ocean</b>	2	0	0	2
<b>Small Hydropower</b>	1	0	5	6
<b>Solar Thermal</b>	731	500 – 850	399 – 999	1,629 – 2,579
<b>Solar Photovoltaic</b>	7	8 – 22	0	15 – 29
<b>TOTAL</b>	<b>1,820 – 2,065</b>	<b>2,918 – 3,886</b>	<b>927 – 1,527</b>	<b>5,666 – 7,478</b>

Source: California Energy Commission, Database of IOU Contracts for Renewable Generation, February 2008 update, [www.energy.ca.gov/portfolio/IOU\\_CONTRACT\\_DATABASE.XLS](http://www.energy.ca.gov/portfolio/IOU_CONTRACT_DATABASE.XLS). Totals may not sum due to rounding.

# 2007 Integrated Energy Policy Report

## Recommendations to Reach RPS Goals



Greenhouse gas reduction goals add to the importance of achieving renewable targets and managing the costs and risks to ratepayers.

- Coordinate the RPS with market-based compliance mechanisms for greenhouse gas reduction.
- To scale toward reaching the 33% goal, California must move to a new system, such as the expanded use of feed-in tariffs.
  - This can reduce uncertainty, bring down the cost of financing, increase transparency, foster mix of technology development.
- Implement a feed-in tariff set at the MPR for all RPS-eligible renewables up to 20 MW.
  - Until a feed-in tariff is in place, continue to update the MPR.
- Evaluate feed-in tariffs for larger projects for the next decade.
- Establish a feed-in tariff for excess generation from customer-owned solar installations based upon the RPS MPR and time-of-delivery adjustment.

# Additional Information



## California Energy Commission Web sites:

- Renewable Energy Program  
[www.energy.ca.gov/renewables/index.html](http://www.energy.ca.gov/renewables/index.html)
- California's Consumer Energy Center  
[www.consumerenergycenter.org](http://www.consumerenergycenter.org)
- Integrated Energy Policy Reports  
[www.energy.ca.gov/2006\\_policy\\_update/index.html](http://www.energy.ca.gov/2006_policy_update/index.html)  
[www.energy.ca.gov/2007\\_energypolicy/index.html](http://www.energy.ca.gov/2007_energypolicy/index.html)

## California Public Utilities Commission Web site:

- Renewables Portfolio Standard  
[www.cpuc.ca.gov/PUC/energy/electric/renewableenergy/index.htm](http://www.cpuc.ca.gov/PUC/energy/electric/renewableenergy/index.htm)



# Thank you

## Questions/Comments??

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