CALIFORNIA'S PROGRESS IN RENEWABLE ENERGY CFEE DECEMBER 2011

Michael Picker
Senior Advisor to the Governor for Renewable Energy Facilities

2011 Update Topics

- Permits issued for Utility Scale in 2010/2011
- Desert Renewable Energy Conservation Plan
- Focus on Transmission/Revised MOU with Interior
- Distributed Generation Roadmap

Governor Brown Renewable Energy Goals

- Building 12,000 MW of Localized Electricity Generation

- Building 8,000 MW of Large Scale Renewables

- Planning and Permitting New Necessary Transmission Within 3 Years

- Dealing with Peak Energy Needs and Develop Energy Storage

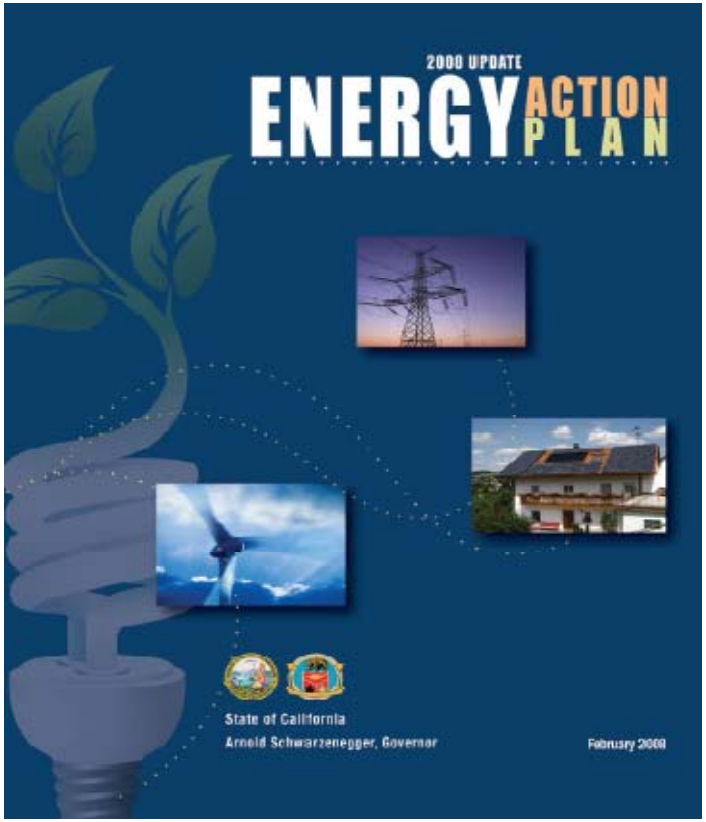
- Timeline to Make New Homes and Commercial Buildings Zero Net Energy

- Making Existing Buildings More Efficient

- Adopting Stronger Appliance Efficiency Standards

- Increase Combined Heat and Power (COGEN) Production by 6,500 MW

Energy Action Plan: Loading Order



- Energy efficiency
- Demand response
- Distributed generation
- Renewable generation
- Cleanest available fossil resources

Source: http://www.cpuc.ca.gov/PUC/energy/electric/energy+action+plan/

Projects Permitted in 2010

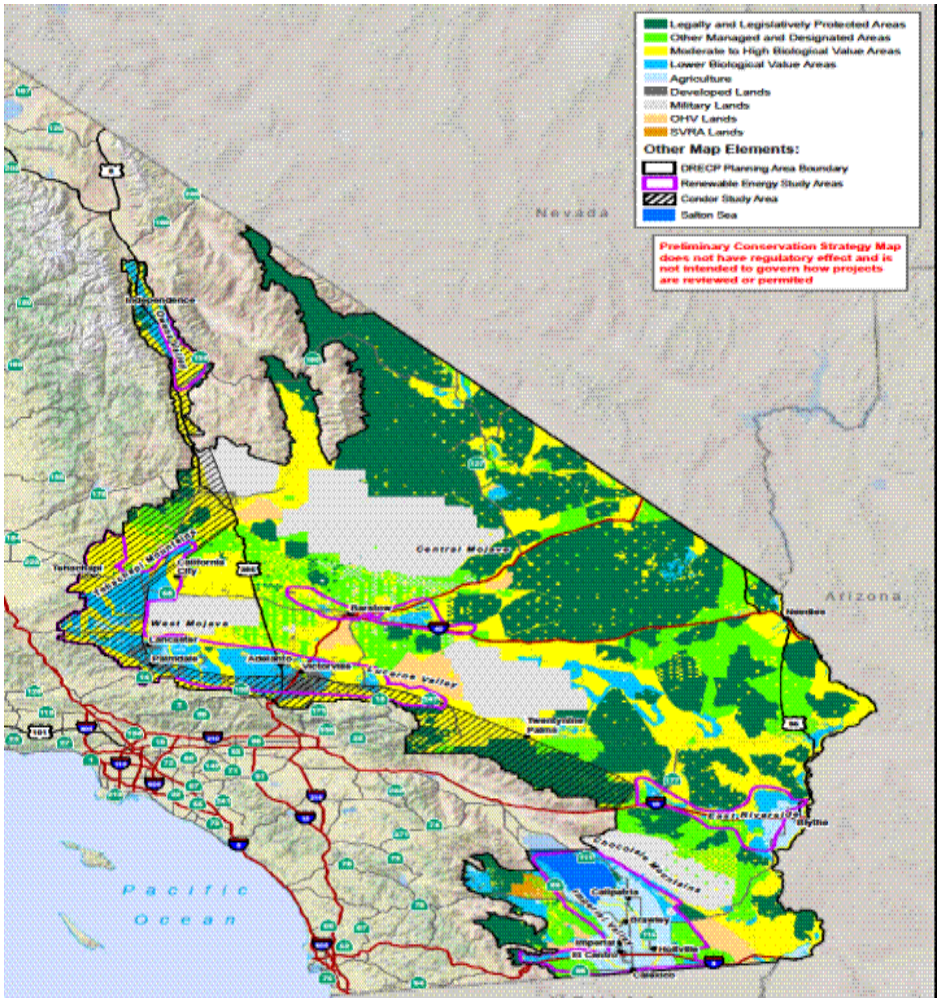
County	Bio	Cogen*	Geo	PV >20MW	PV <20MW	Solar Thermal	PV/ Solar Thermal	Wind	Total
Imperial			208	1,259					1,467
Kern	44			867	24	250		2,169	3,354
Kings				145					145
Los Angeles		85		337					422
Riverside				175		1,734			1,909
Sacramento					2				2
San Bernardino				20		770	633		1,423
San Diego				45					45
San Luis Obispo				250					250
Shasta								102	102
Solano								155	155
Stanislaus				50	1				51
Tulare				110					110
TOTAL	44	85	208	3,258	27	2,754	633	2,426	9,435

* Cogeneration refers to a pipeline biomethane facility that has applied for RPS precertification.

Source: *Renewable Power in California: Status and Issues*, August 2011, CEC-150-2011-002

DRECP Preliminary Conservation Strategy

- Mojave & Colorado Desert Eco-regions
- Counties include:
  - Imperial
  - Inyo
  - Kern
  - Los Angeles
  - Riverside
  - San Bernardino
  - San Diego
- ~ 22,587,000 acres



CA transmission upgrades can deliver renewable requirements (CA ISO March, 2011)

	Transmission Upgrade	Aproval Status CAISO	Aproval Status CPUC	Renewable Potential MW	Renewable Potential TWh/year
1	Carrizo-Midway	Pending LGIA	Not yet filed	900	2.1
2	Sunrise Powerlink	Approved	Approved	1,700	4.1
3	Eldorado - Ivanpah	LGIA	Decision Pending	1,400	3.6
4	Pisgah-Lugo	LGIA	Not yet filed	1,750	4.1
5	Valley - Colorado River	Approved	Approved*	4,700	8.6
6	West of Devers	LGIA	Not yet filed		
7	Tehachapi	Approved	Approved	4,500	15.2
	Other - CAISO Grid Upgrades	Mixed	Mixed	2,700	7.2
	Other - Outside of CAISO Grid	N/A	N/A	3,300	8.4
	Total				53.3

*Petition to modify CPCN pending.

CAISO Balancing Area Needs for 33% 44

	Transmission Upgrade	Primary Type of Upgrade	Expected COD
1	Carrizo-Midway	Reconductor 230 kV lines	2012
2	Sunrise Powerlink	New 500 kV & 230 kV lines	2012
3	Eldorado - Ivanpah	Convert 115 kV lines to 220 kV	2013
4	Pisgah-Lugo	Convert 230 kV lines to 500 kV	2017
5	Valley - Colorado River	New 500 kV lines	2013
6	West of Devers	Reconductor 230 kV lines	2017
7	Tehachapi	New 500 kV & 220 kV lines	2015

Some additional transmission upgrades to support grid reliability and generation delivery to load centers will be needed.

CTPG Renewables Transmission Projects (February, 2011)

Distributed Generation Roadmap

- What renewable energy power projects are counted toward the Governor's goal?
- How much generation is already operating, pending or authorized?
- How should the remainder of the Governor's 12,000 MW goal be achieved?
- How do we make expansion local renewable energy more efficient, effective and equitable?

Definition of Distributed Generation

- Fuels and technologies accepted as renewable for purposes of Renewable Portfolio Standard
- Sized up to 20 MW
- Located within low-voltage distribution grid or supply power directly to consumer

Operational, Pending or Authorized

Total Online, Pending, and Capacity Authorized: **4,998.522MW**

+

Total Online, Pending, and Capacity Authorized: **3,000MW**

=

7,998.52MW

12,000MW Goal

−

7,998.52MW Current total

=

4,001.48MW remaining

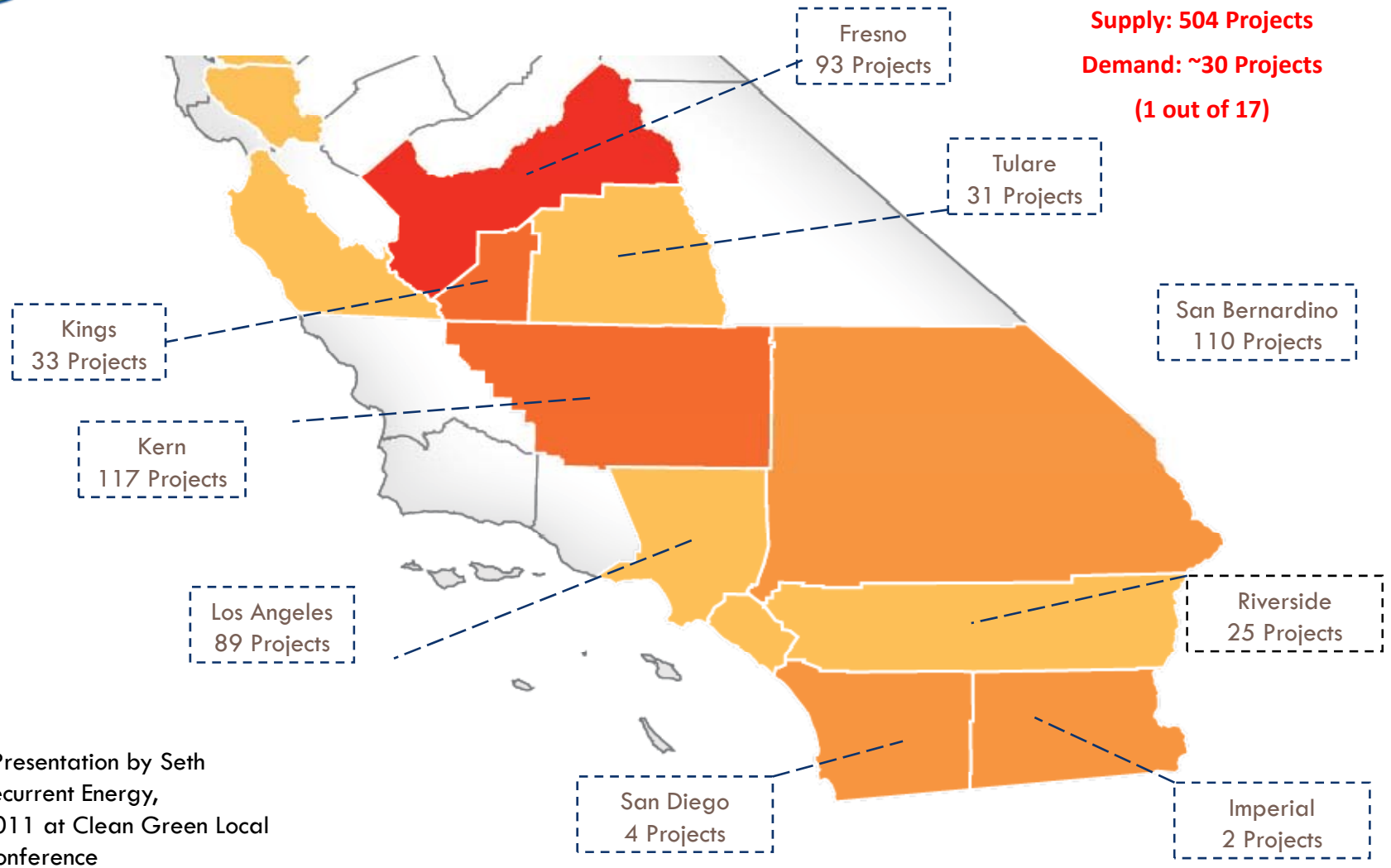
Adaptive Program for Remainder

- Implement and track existing programs:

1. Which add reliability and/or avoid transmission?
2. Which are most effective in cost containment?
3. Which produce the most generation most quickly?
4. Which are administratively efficient?
5. Which support other state policies (RPS, DR?)
6. Which maintain diversity of resources?

- Develop and expand on programs that fit integrated resource planning.

Projects 20MW & Under in CAISO, PG&E, SCE, and SDG&E Interconnection Study Queues



Supply: 504 Projects

Demand: ~30 Projects

(1 out of 17)

Source: Presentation by Seth Israel, Recurrent Energy, 12/2/2011 at Clean Green Local Power Conference