

SunEdison

Growing the Solar Renewable Energy Credit Market in California

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What is a Solar Renewable Energy Credit (SREC)?



- A REC is the environmental benefit of producing 1 Megawatt hour of energy in a clean manner
- “green power = green + power”
REC = “green”
- RECs enable this greenness to be purchased separately from the power generated
- A SREC is a REC produced by a solar installation
- People are willing to pay 5-20 times as much for a REC from a solar source in place of other clean sources (wind, hydroelectric, etc)

SunEdison



- The largest US commercial PV contractor
- Finances solar installations on commercial roofs
- Sells power at fixed rate to roof owner, sells solar panels to investors
- Wants to supplement income selling Solar Renewable Energy Credits (SRECs)
- Declining subsidies in California threaten SunEdison's ability to install solar systems
- **Objective**: Identify ways to increase SREC demand, especially in California
 - Voluntary markets
 - Legislation

Executive Summary



- Legislative outcomes largely determine whether voluntary markets are the primary or cosupporters of solar energy installations in California.
- After investigating a variety of novel voluntary SREC markets, we would recommend development of solar offset gas and a solar offset bonus credit card.

Why We Care About Legislation

- Sets the “rules of the game” for
 - Compliance Markets
 - Voluntary Markets
- Key question: Who owns the REC if the installation was subsidized?

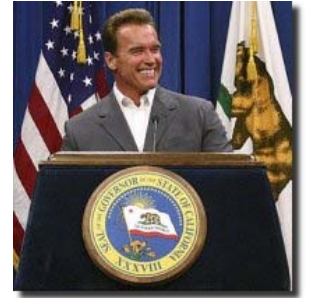


Recent Activity of California Legislation



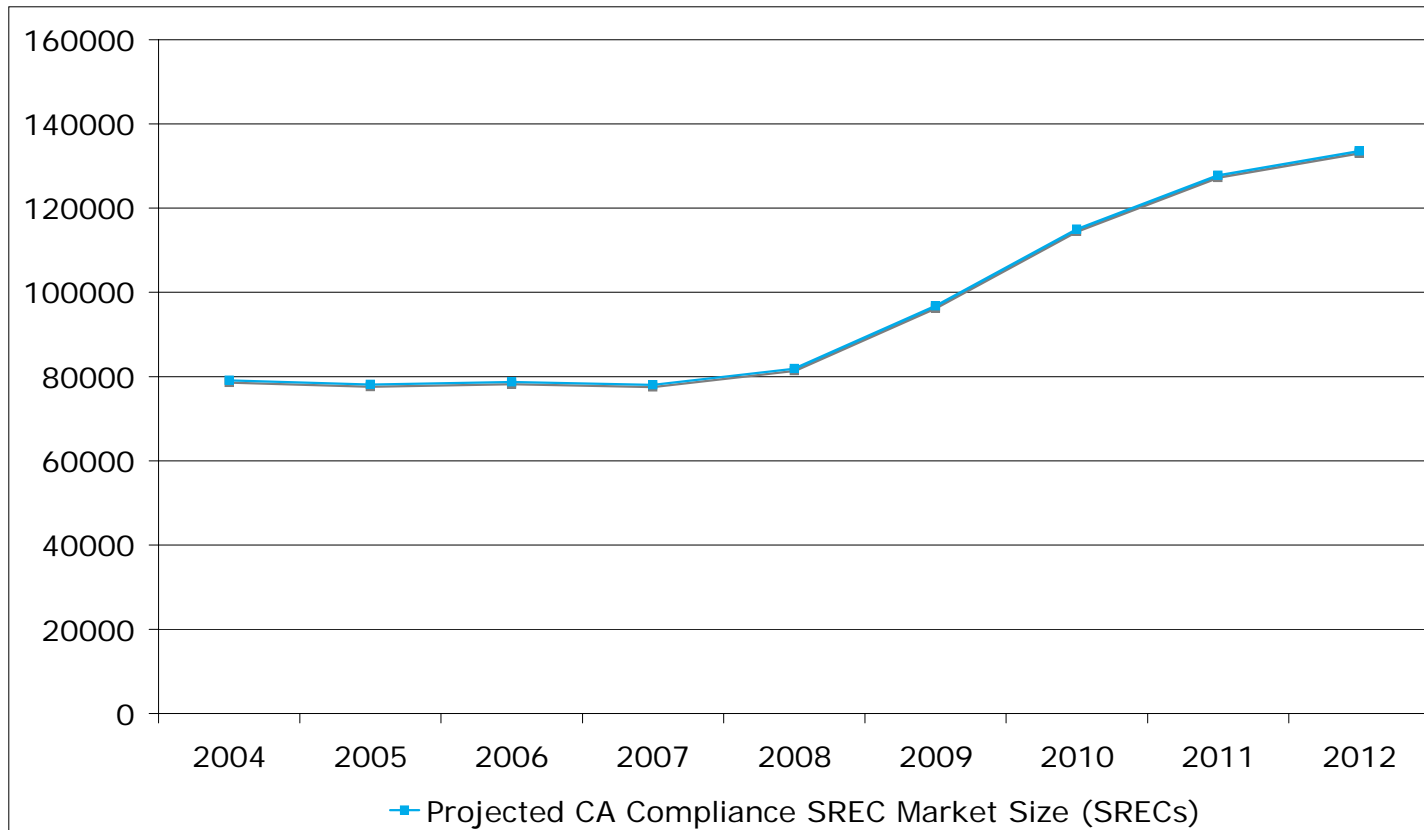
- AB 32 - Global Warming Solutions Act
 - Motivates carbon footprint registration to be offset
 - Does not specify to REC Market
- SB 107 - Renewable Energy: PIER Demonstration and Development
 - Advances RPS goal & formalizes REC definition
 - WREGIS to be online mid-2007

California Solar Initiative

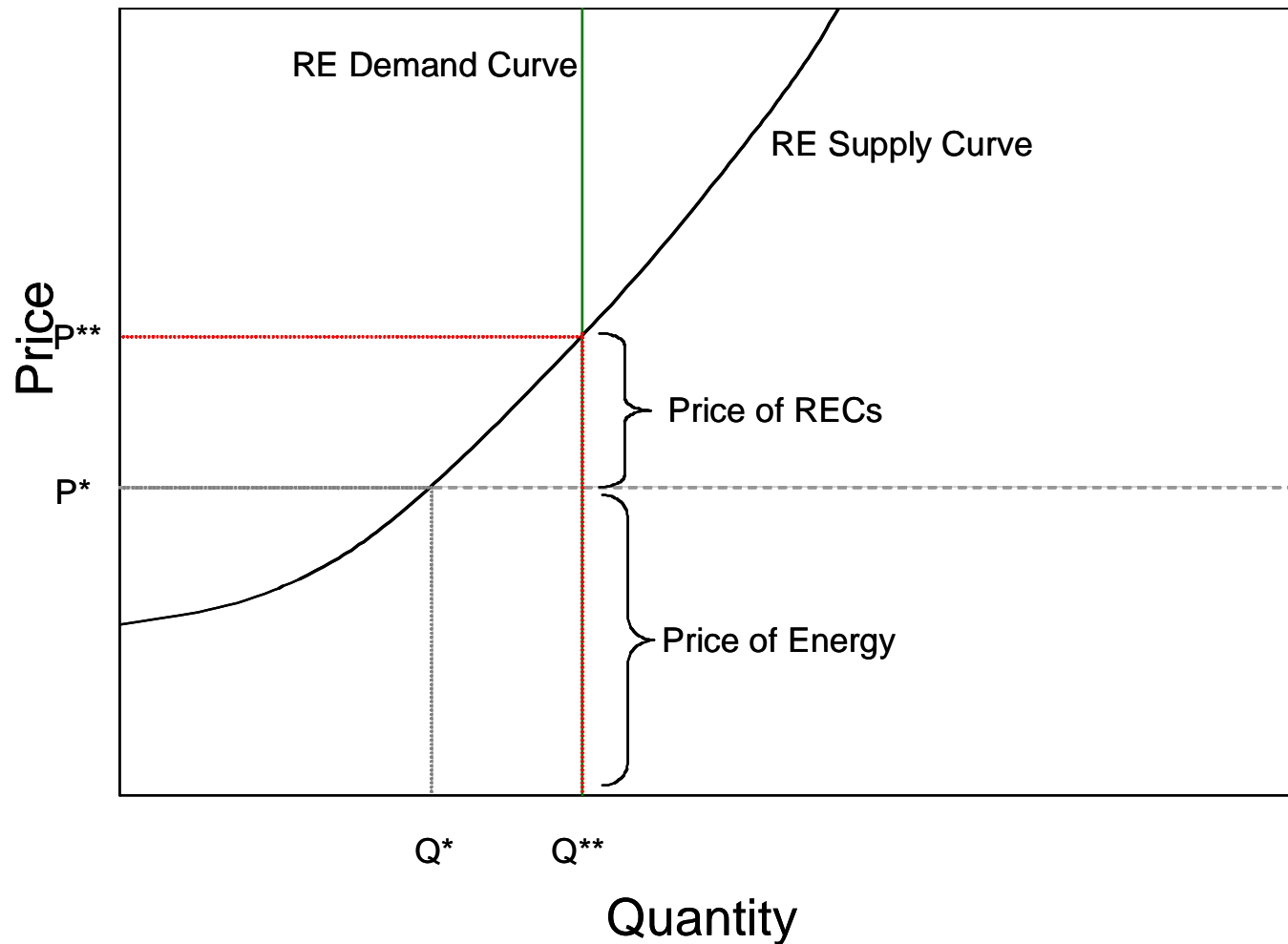


- SB 1 and CPUC/CEC combined effort
 - \$3 Billion dollar incentive program to install 3,000 MW over the next 10 years
 - With large subsidy, who owns the REC?
- Current proposed decision (12/6/06) has *all* of the REC (including subsidized portion) going to the system owner
 - All non-subsidized RECs already went to the system owner and not to the utility
 - REC can not be counted towards the RPS goal
 - Recognizes there is a *potential* value to a REC

Projected SREC Compliance Market Size



Benefits of SREC Decoupling from Price of Energy



Voluntary Markets

- Sell SRECs to consumers by a variety of vehicles
- Various options evaluated according to potential market size, time/cost to implement, degree of cooperation required, and other obstacles to introduction



Direct SREC Sale



BONNEVILLE ENVIRONMENTAL
FOUNDATION

- Organizations like BEF offer 1% and 10% solar RECs for individual purchase
- Could offer variable or 100% solar
- Could increase solar REC sales by 10,000 RECs/year
- High transaction costs until WREGIS is online



Solar Product Sticker



- Could create a recognized “Made with Solar” sticker, similar to “Made with Cotton” or “100% Organic”
- Similar to “green tags” currently in use except “built in” to the product
- Very large potential market size
- Requires an independent auditing agency, very large amount of collaboration, marketing effort, very expensive

Utility Bill Solar Checkbox

- Utilities could offer consumers the option to purchase SRECs to offset the environmental impact of their residential (or commercial) energy use
- Estimate \$12 M in revenue by participation of 100,000 California individuals (less than the number of hybrid owners)

HAMPTON ROADS
 UTILITY BILLING SERVICE

ACCOUNT NUMBER: [REDACTED] BILL DATE: 12/11/02 DATE DUE: 01/10/03 PAY THIS AMOUNT: 100.07

TRAY/PKG= 000046/000/0017437400

NORFOLK VA 23502-2932 HRSD PD BOX 1651
 NORFOLK VA 23501-1651

PLEASE DETACH AND RETURN THE ABOVE PAYMENT COUPON WITH YOUR CHECK.

ACCOUNT NUMBER	BILLING PERIOD	NO. DAYS	READINGS	CONSUMPTION
	11/05/02-12/09/02	34	PRESENT	PREVIOUS
SERVICE ADDRESS			8	2
JURISDICTION NUMBER			4488 GAL	
PREVIOUS BALANCE			45.58	
UTILITY SERVICE CHARGES (BASED ON CONSUMPTION)				
WATER CHARGE (NORFOLK)			15.08	
SEWER MAINT FEE (NORFOLK)			10.02	
SERVICE CHARGE (NORFOLK-FIXED MONTHLY FEE)			1.00	
WASTEWATER TREATMENT (HRSD)			8.16	
SUBTOTAL			34.26	
MUNICIPAL SERVICES AND MISCELLANEOUS CHARGES				
TAX			3.77	
STORM WATER			6.12	
REFUSE DISPOSAL			10.34	
SUBTOTAL			20.23	
TOTAL AMOUNT DUE			100.07	

Your payment of \$115.69 was received on 10/18/02.

PAY BY DUE DATE TO AVOID A FINANCE CHARGE OF 10% PER YEAR COMPUTED DAILY. HRSD WASTEWATER TREATMENT CHARGES LESS THAN 2 CCF - \$1.00 MINIMUM CHARGE. 1 TO 20 CCF - \$1.50 PER CCF. OVER 20 CCF - \$1.25 PER CCF.

MESSAGES	CUSTOMER SERVICE LOCATIONS
THE DUE DATE ON THIS BILL DOES NOT APPLY TO THE PREVIOUS BALANCE.	NORFOLK MONDAY - FRIDAY 7:30 AM - 4:30 PM WATER AND SEWER MAINTENANCE BILLING 664-6750 STORMWATER BILLING 664-6633 REFUSE DISPOSAL 441-5813 24-HOUR WATER AND SEWER SERVICES 823-1000
We wish you a safe and happy holiday.	HRSD 460-2491 MONDAY - FRIDAY 8:00 AM - 4:30 PM

012480

Solar Gas



- Sell SREC offsets for consumer transportation use at the pump.
- After filling up, the electronic display may show “Offset emissions Yes/No” thereby giving the consumer an option to offset the environmental impact of his vehicle.
- Est. 200,000 REC annual sales in the Bay Area. 75% wind/25% Solar SREC gives added cost of \$0.25/gal gives \$2.5 M in SREC revenue from this region. \$21 M for 0.1% nationally

Solar Credit Card



- Use money ordinarily spent on credit card bonuses (airline miles, cash back, etc.) to purchase RECs and thereby offset consumer environmental impacts.
- Estimate \$15 M in annual SREC sales if 0.1% of US consumers adopted it.
- Attempted to contact JP Morgan-Chase's environmental affairs office to ask about this, did not get a response—let us know if you know how to reach them!

Conclusions



- Solar Gas and Solar Credit Cards are two easy-to-implement programs to drive SREC market in the state
- Voluntary markets are viable due to current passed and proposed legislation
- There is strong potential for SunEdison's continued operation in California

Thank you!