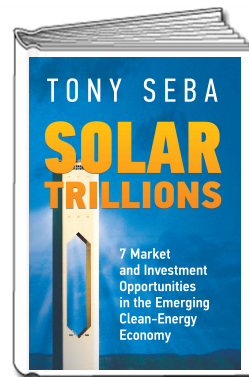


# CLEAN POWER HEALTHY COMMUNITIES CONFERENCE

May 10<sup>th</sup>, 2012

**Tony Seba**

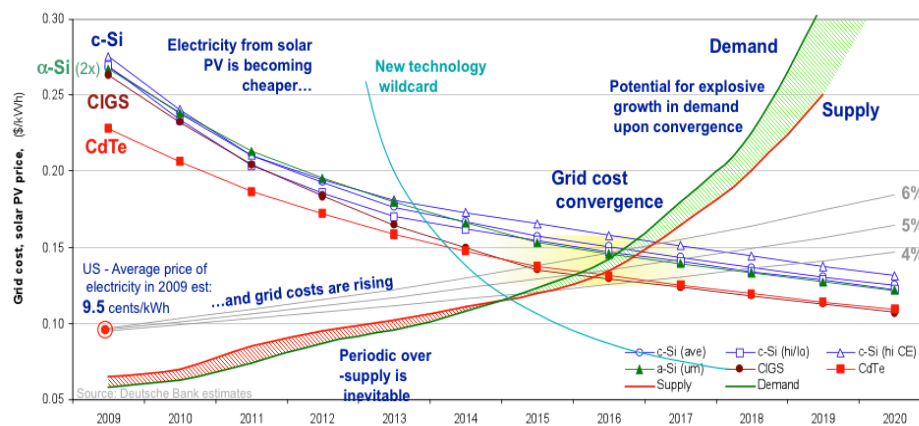
tony@tonyseba.com



"Solar Trillions"

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## Solar vs Conventional Power Costs



- **Solar costs go down** while **conventional power costs historically go up...**
- **It's clear what's about to happen...**

Source: Deutsche Bank

It's already happening!

**"78% of our customers  
start saving money on  
day 1."**

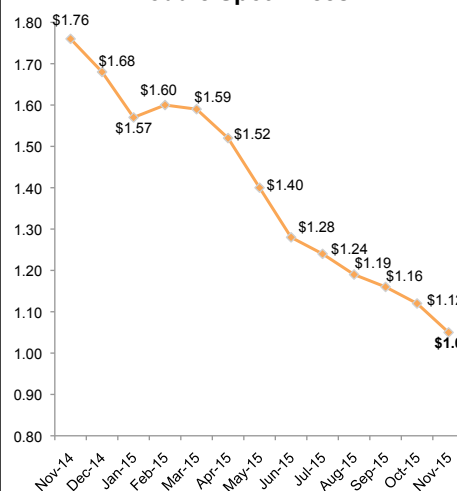
Danny Kennedy  
Founder, Sungevity  
@Tony Seba's Stanford  
class Feb 2012



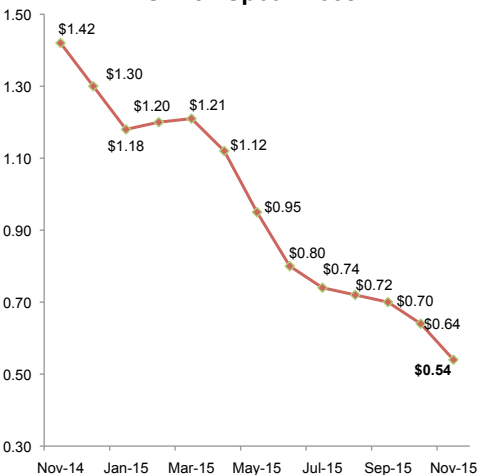
Image Source: Questpoint Solar

## Solar Panel Costs Dropped ~50% last year

**Module Spot Prices**



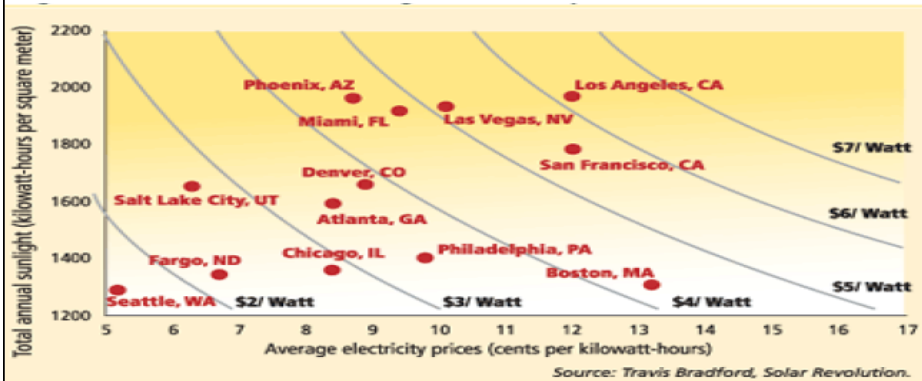
**C-Si Cell Spot Prices**



Source: Cleanpath Ventures

## Solar for All Americans

- **By 2015 – unsubsidized solar will cost less than subsidized grid power in 2/3 of US .**
- **40-50 Million homes** will be paying more to the utilities than they could get from rooftop solar!



## NRG Energy CEO:

*"In the **next 3-5 years** you'll be able to get power cheaper from your rooftop than from the grid."*



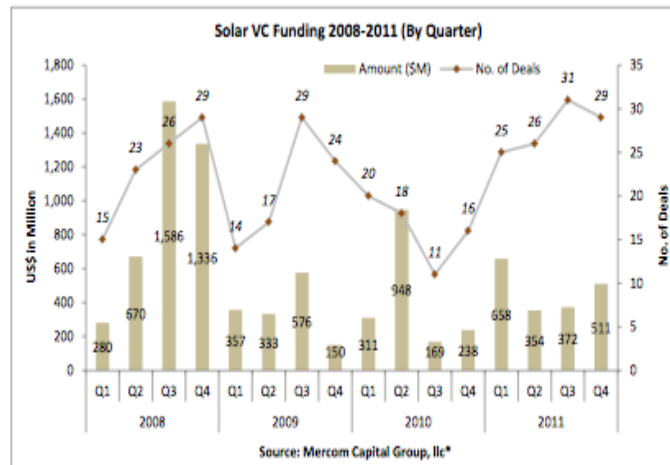
NRG Energy  
CEO David Crane

**"Solar is going to go from this thing that right now is like 0.1% of the market to 20 to 30% of the overall electricity mix. That's huge."**

Source: Yale Environment 360,  
Nov 9, 2011

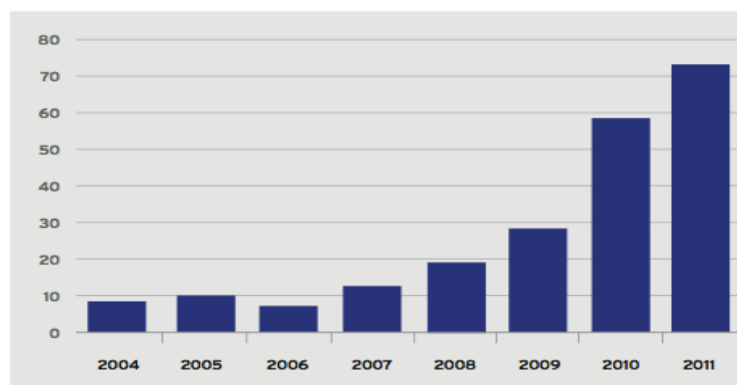
## 2011: Record VC Funding for Solar

Record 111 VC funding deals - the largest ever for the solar industry.



## Record Investments in small DG (<1 MW) ...

Investments in Small Distributed Generation **Grew 900%** over five years to a **record \$71.5 Billion in 2011**. (1)



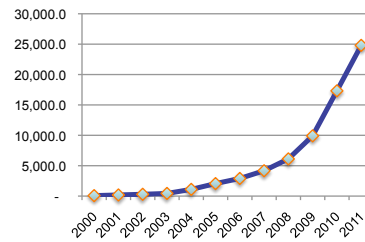
G-20 Investments in small (<1 MW) Distributed Generation  
(Billions USD)

Image source: Pew Clean Energy  
(1) Pew Clean Energy

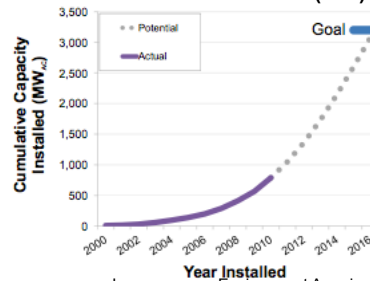
## Million Solar Roofs

- RPS goal of **12 GW** of Distributed Generation by 2020
  - 1,000,000 solar installations
- At the end of 2011, CA had
  - 100,000 PV installations, &
  - 1GW of solar capacity (3)
- Can we grow 10X growth in 8 years?
- CA grew 100x in 10 years
  - 1,000 PV installations (2000)

Germany Solar PV Capacity (MW)



California Solar PV (MW)



(1) PV-Tech Nov 2011  
 (2) Wikipedia  
 (3) Environment America: CA Solar Cities 2012

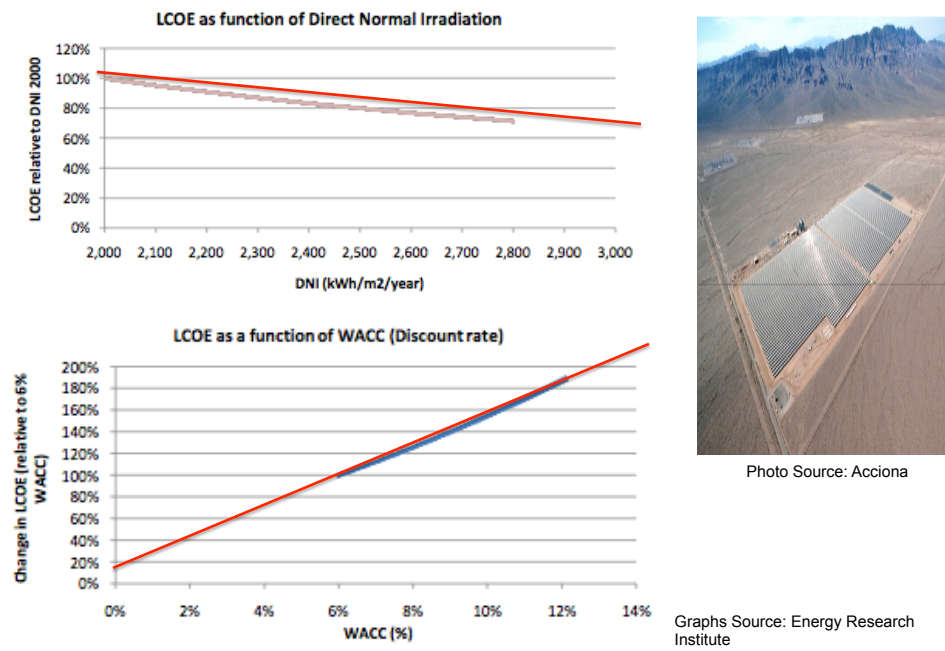
Image source: Environment America

# FINANCE & CLEAN ENERGY

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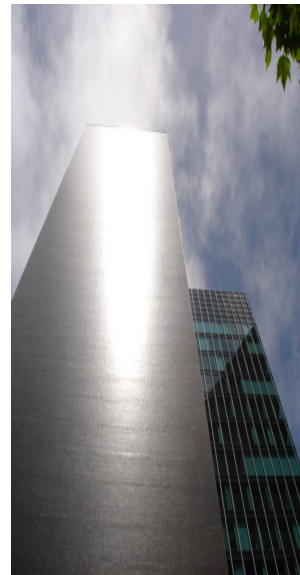
## Cost of Capital makes **HUGE** difference



## Finance & Clean Energy

Simple & **Low Interest Financing** is A KEY ENABLER of Clean Energy

**Energy FLOW = CASH FLOW!**



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## Financial Enablers

Enabling **standard finance mechanisms & lower cost of capital** can make a huge difference in increasing clean energy investments and jobs.

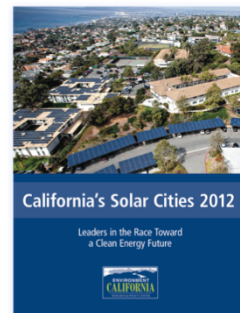
Here are some mechanisms to do that:

1. Property Assessed Clean Energy PACE
2. Bond-PPA Hybrid - NJ Morris Model
3. Third-Party Finance
4. Soon: CrowdFunding
5. Feed-In-Tariffs

## 1- Sonoma PACE : the Future of CA

- Sonoma is the #1 CA city in terms of both
  - Solar Capacity (W) per capita and
  - Solar Installations per capita (1)
- (Large towns with 10,000 – 50,000 residents.)

Rank	City	Number of Installations per 100 Residents	Rank	City	Solar Capacity per Capita (Watts)
1	Sonoma	4.5	1	Sonoma	507
2	Grass Valley	3.4	2	Auburn	420
3	Auburn	3.3	3	Oroville	313
4	Mill Valley	2.4	4	Healdsburg	266
5	Healdsburg	2.4	5	Newman	205
6	Ladera Ranch	2.2	6	Rancho Mirage	171
7	Placerville	2.2	7	Paso Robles	170
8	Ramona	1.9	8	Grass Valley	151
9	Los Gatos	1.8	9	Oakdale	148
10	Rancho Mirage	1.7	10	Placerville	138



(1) Environment CA, "California's Solar Cities 2012"

- If California Cities had the same per-capita Solar as Sonoma we'd have **19 GW** and **1.7 million** installations of solar!

## 5 Reasons Why CA Cities can surpass 12 GW and 1 Million Solar Rooftops

1. Sonoma has developed a working template for PACE. (Just replicate it!)
2. The cost of solar is far lower today than when Sonoma County got started.
3. We have a better economy than 2009.
4. CA municipalities have 8 years to do what Sonoma did in 3 years.
5. CA knows PACE works with or without the Federal Housing Finance Agency.

## 2- Bond-PPA Hybrid (Morris Model)

County, Tranche, Year	Local Hosts	Portfolio Size	Yr. 1 PPA Price (\$/kWh)	Annual Escalator	Energy Cost Savings (on an NPV basis) <sup>1</sup>
Morris I (2010)	15	3.2 MW	\$0.106	3%	\$3.8M
Somerset I (2010)	31	7.6 MW	\$0.049	2.75%	\$13.2M
Union I (2010)	16	3.4 MW	\$0.068	2.75%	\$3.4M
Somerset II (2011)	33	6.9 MW	\$0.041 <sup>2</sup>	3%	\$11.1M
Mercer I (2011)	1	10.0 MW	\$0.03 <sup>2</sup>	1.5%	\$14.6M

Source: Morris County 2011; Pearlman 2011b; Somerset County 2011a; Somerset County 2011b; Union County 2010; Santilli and Price 2011

Solar Power Yr 1 costs as low as

**3 ¢/kW - 4.1 ¢/kW**

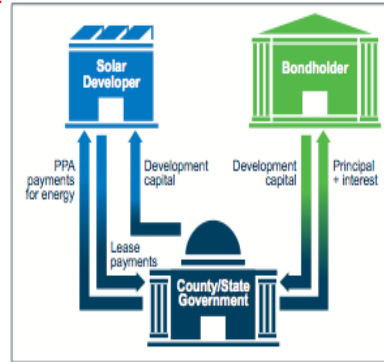
(1) NREL



## Bond-PPA Hybrid (Morris Model)

### Financing Solar PV at Gov't Sites with PPAs & Public Debt

- Under this model a **public entity** (the **Administrator**) issues an RFP for a **Solar Developer** to **build, own, and operate** solar projects on **public buildings** (local hosts). (1)
- The Administrator sells bonds to finance the development costs of the power plant.
- The Administrator then enters into both:
  - A Lease-Purchase Agreement** (with the winning solar bidder), and a
  - PPA** to buy the electricity from the PV system (on behalf on the local host.)

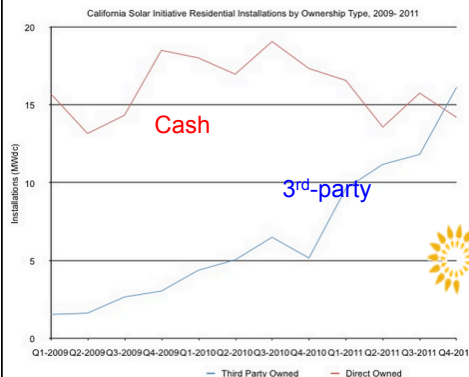


Money Transfers in the Morris Model

(1) NREL

## 3 - Third Party Finance

- ~**70%** of California Residential Solar PV is **third-party** owned & financed (March 2012) (1)
  - This includes PPA and Leasing.
  - CA 3<sup>rd</sup>-party finance = substantially all growth in residential solar...



California Solar Initiative

Images Source: GTM Research



(1) PV Solar Report

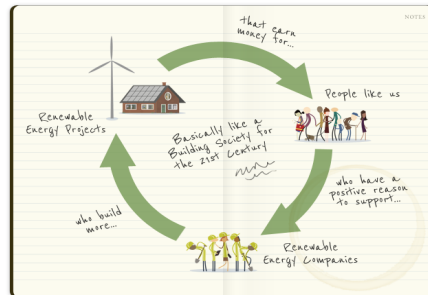
## 4 – Solar Crowdfunding

- The new JOBS Act (signed April 2012) allows companies to raise money directly from individuals online - crowdfund.
  - Startups can raise up to \$50 million from up to 1,000 investors before registering with the SEC. (1)
- US companies like Kickstarter, Kiva and SolarMosaic have done it in the recent past –
  - but they **could not pay back a return on investment...**
- Abundance Energy is doing this (wind project) in the UK...
- SolarMosaic (Oakland) to do it this summer...



Images Source: GTM Research

(1) Mashable



Images: Abundance Energy, Solar Mosaic websites

# THE TIME IS NOW!

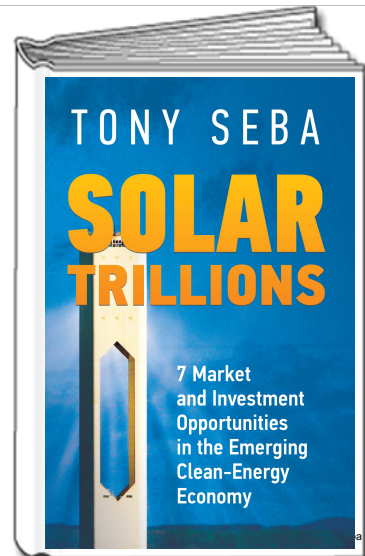
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# Thank you!

[tony@tonyseba.com](mailto:tony@tonyseba.com)

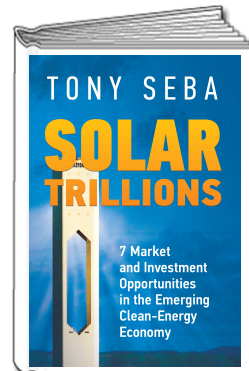
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May 10<sup>th</sup>, 2012

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