

Here Comes The Sun

The Rise of Solar



Bill Eddie
President, OneEnergy Renewables
February 17, 2015

WHO WE ARE

- ▶ Developer of offsite, multi-megawatt renewable energy projects
- ▶ Portfolio solutions for renewable and carbon goals



Utility-Scale Projects

- 2 to 50 MW
- Primarily solar PV
- Multiple US states
- From 'concept to operation'
- PPA & financial innovation



Renewable Energy Credits

- Portfolio solutions for renewable & carbon goals
- Tracked & verified RECs
- Corporate and institutional customers

Certified



Corporation™

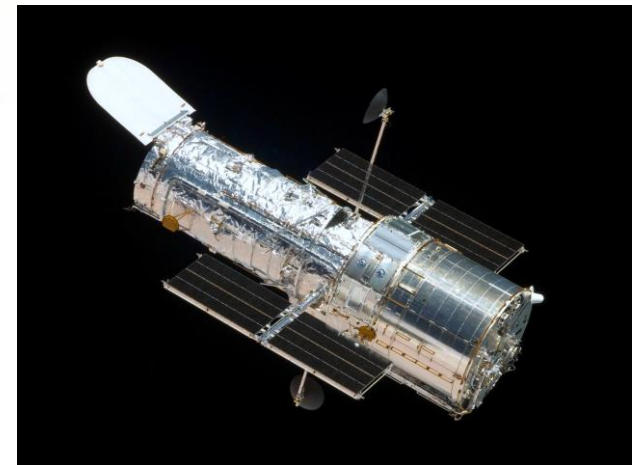
bcorporation.net

NOT A NEW IDEA



We are like tenant farmers chopping down the fence around our house for fuel when we should be using Nature's inexhaustible sources of energy — sun, wind and tide. I'd put my money on the sun and solar energy. What a source of power! I hope we don't have to wait until oil and coal run out before we tackle that.

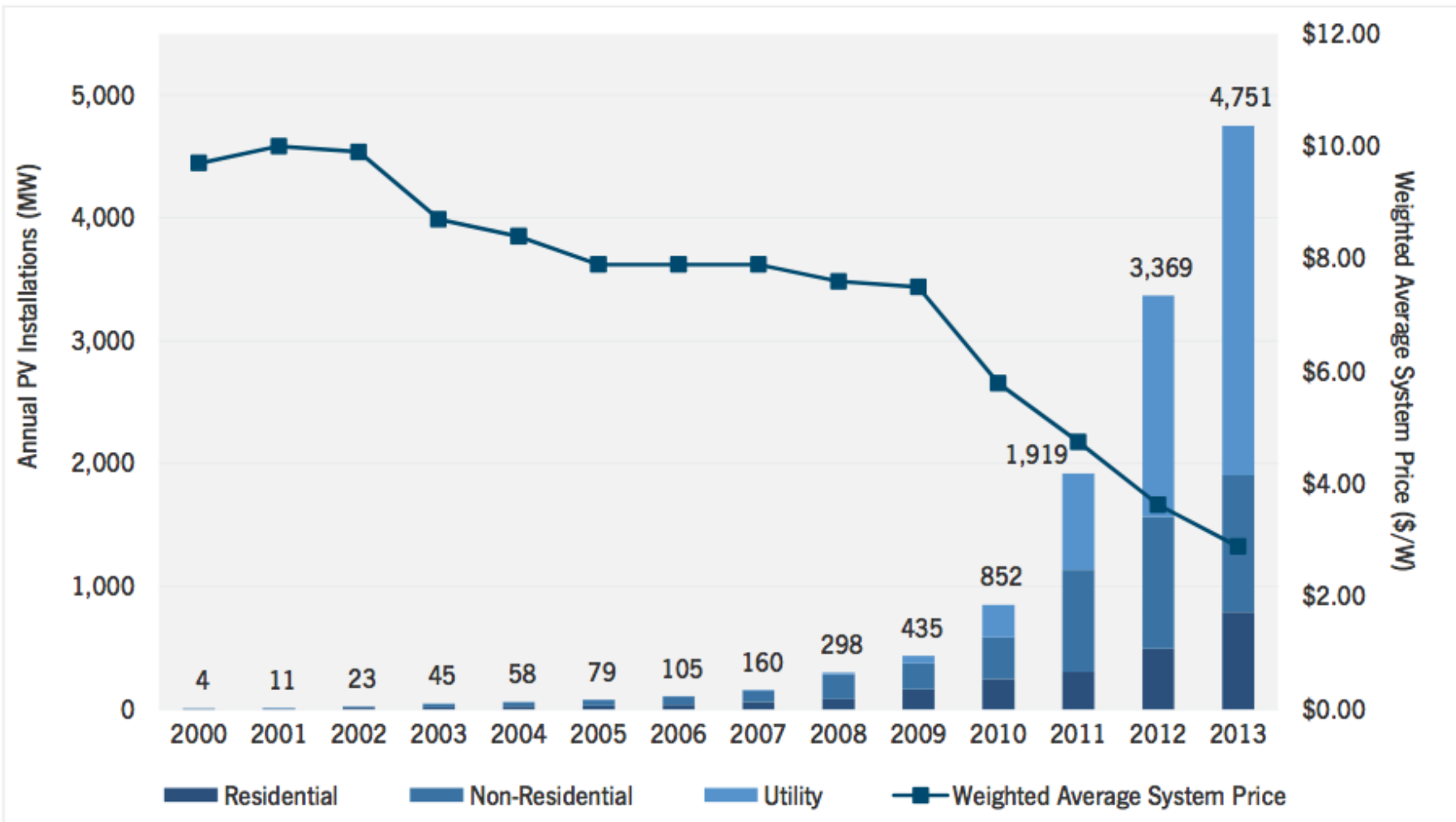
• Thomas Alva Edison, 1931



A HIGH VALUE PRODUCT

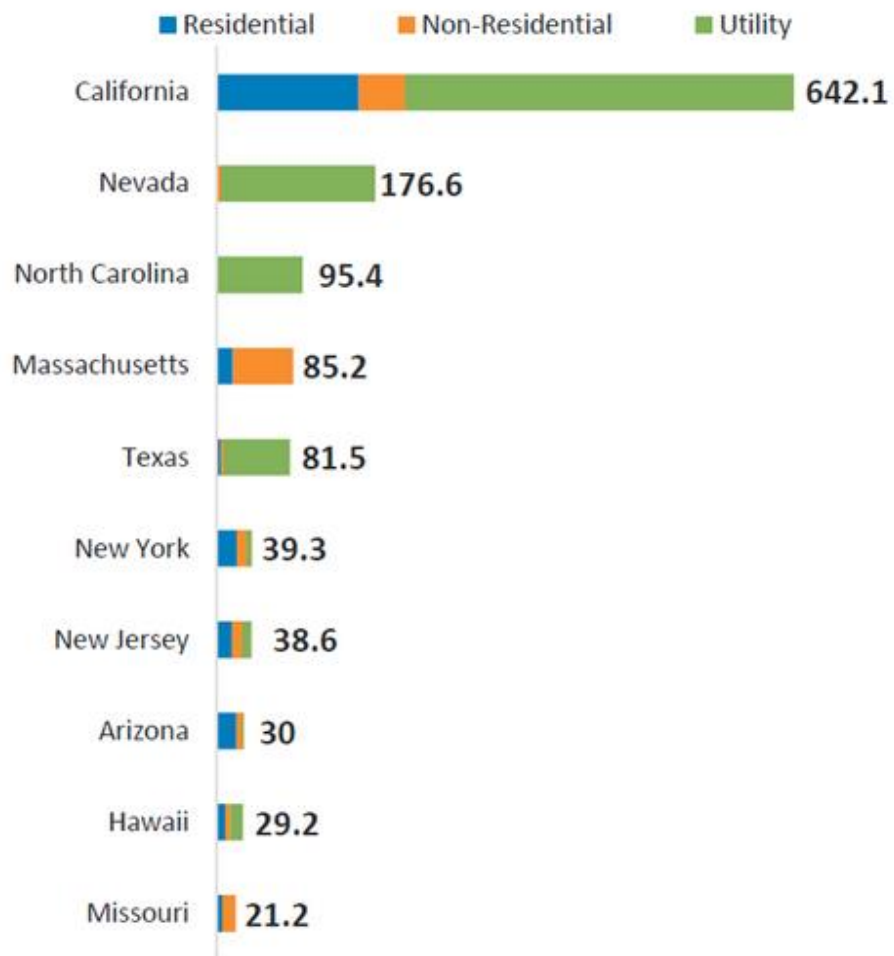
- ▶ Sun is the Fuel = No Fuel Price Risk
- ▶ It just works
- ▶ Correlates well with peak demand, especially in summer
- ▶ Modular – can be sized according to customer demand and located close to power usage
- ▶ Good economies of scale at relatively small size

LOWER PRICES YIELDS MASSIVE GROWTH



Source: 2013 US Solar Market Insight Report, Greentech Media Research

Q3 2014 Installed PV Capacity



WILL PRICES KEEP DROPPING?

- ▶ Solar panels: Incrementally better production, incrementally less expensive
- ▶ Inverters: Smarter, more utility-friendly, more efficient
- ▶ Tracking systems: Less expensive to build and operate, more reliable
- ▶ Balance of plant: More quality contractor firms doing more solar

FINANCIAL INNOVATION IS A GAME CHANGER

Distributed solar now has access to larger pools of low-cost capital.

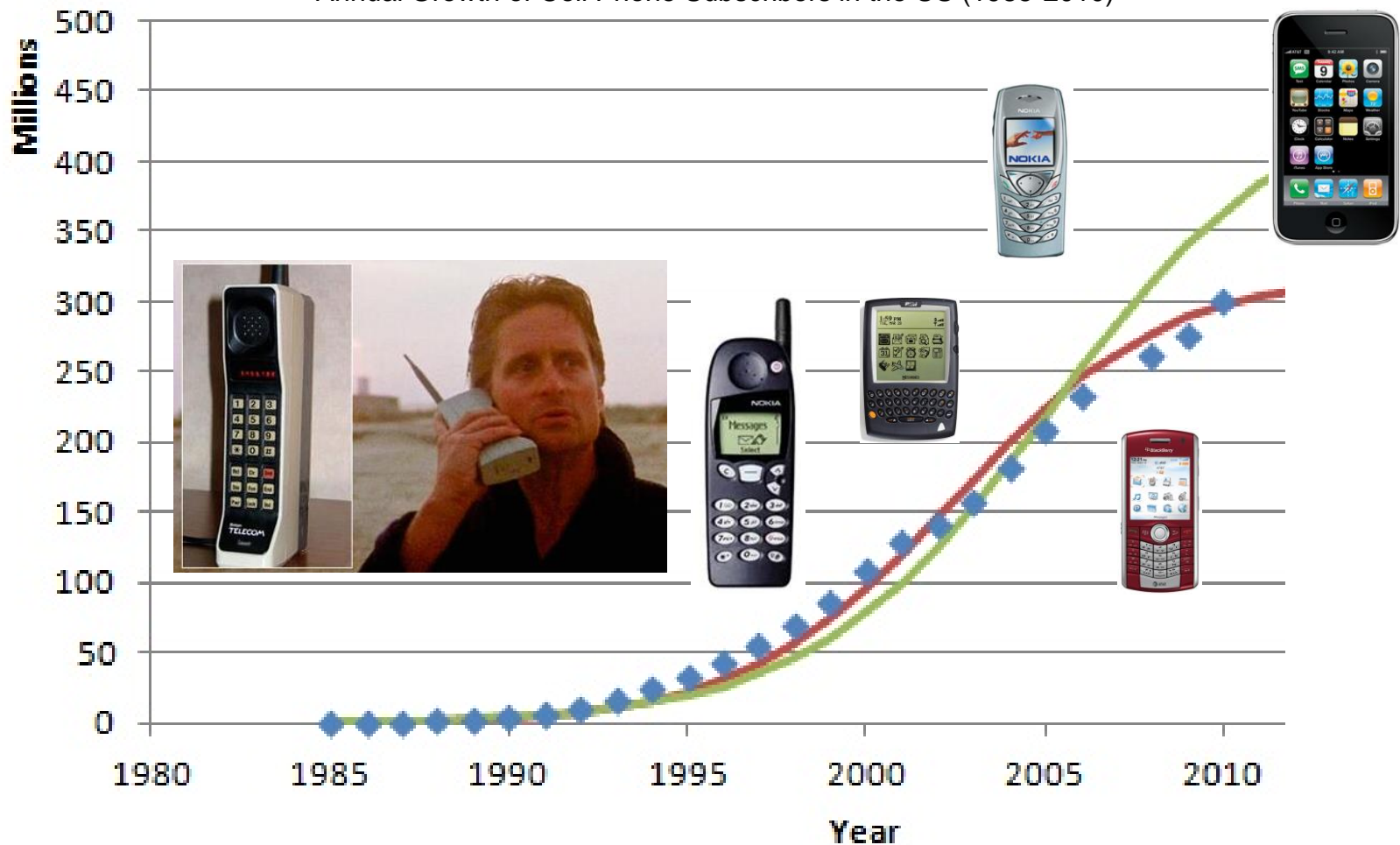
- TerraForm Power (TERP – NASDAQ)
- NRG Yield (NYLD – NYSE)

Other financial innovation lowering cost of capital:

- SolarCity – “Solar Asset Backed Notes”

HAVE WE SEEN THIS BEFORE?

Annual Growth of Cell Phone Subscribers in the US (1985-2010)



Source: CTIA – The Wireless Association

◆ Actual Subscribers

— Best-Fit Subscribers

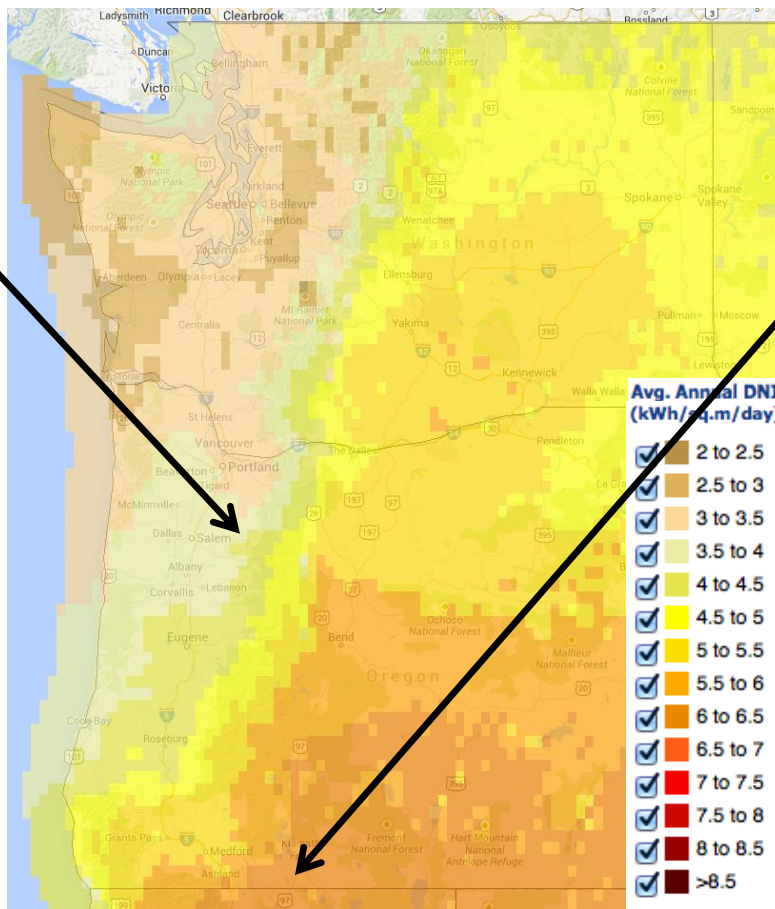
— Alternate Estimate

SOLAR IN OREGON

1 MW in Salem

Year 1 Energy:
1,300 MWh

*Economics do not justify
tracking*



1 MW in Klamath Falls

Year 1 Energy:
2,000 MWh

**Significantly more
sun**

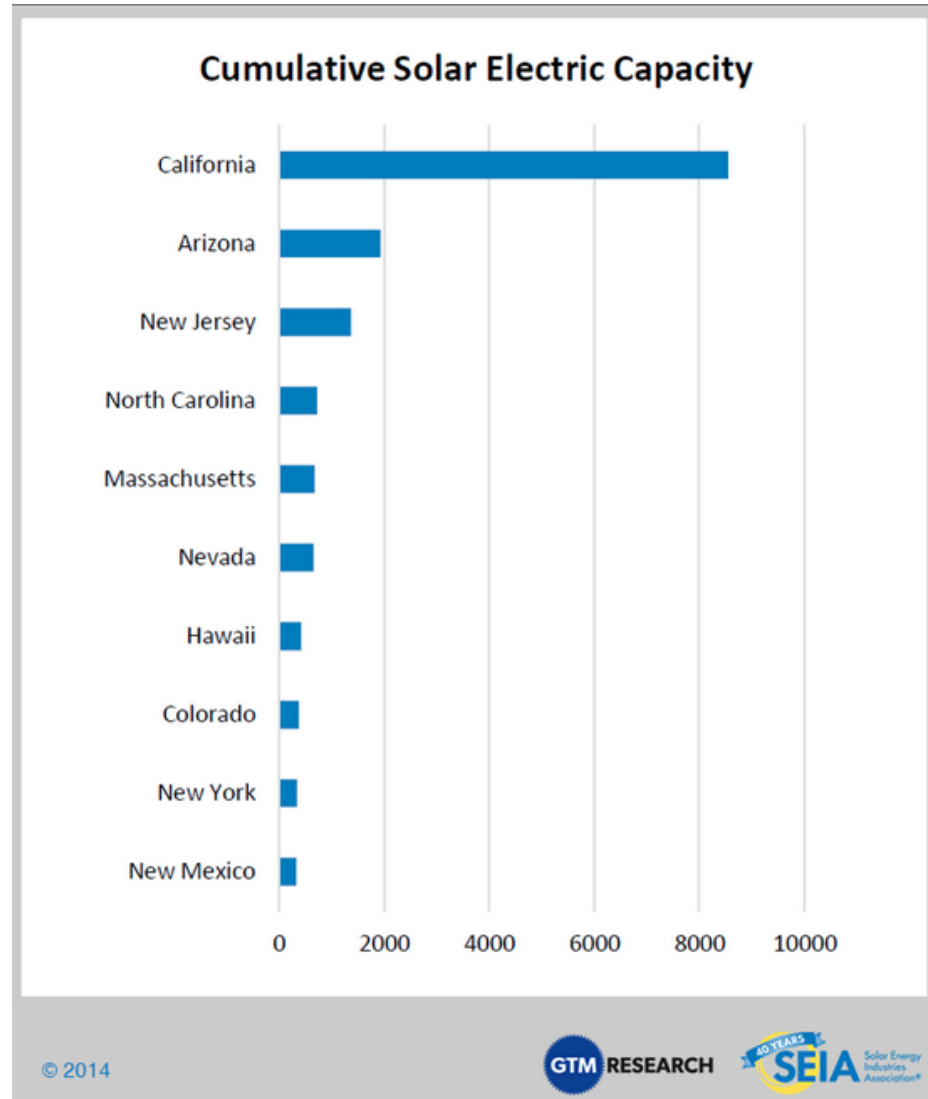
**Single-axis
Tracking**

How Does our Resource Compare?

- Willamette Valley: Comparable to much of the Northeast U.S.
- Klamath and Lake Counties: As good or better than California's central valley

State by State

- Over 8,500 megawatts installed in California
- New Jersey, 1,400 megawatts
- Massachusetts, 760 megawatts installed
- Oregon, 85 MW



New Jersey

Month	MW Installed
October 2014	11.7 MW
November 2014	7.7 MW
<u>December 2014</u>	<u>58.5 MW</u>
<i>Q4 2014 Total</i>	77.9 MW

CHALLENGES FOR SOLAR IN OREGON

- ▶ Rate structures favor old coal over new renewables (*low avoided cost prices*)
- ▶ Poor coordination among utilities, opaque energy market function
- ▶ Incentives inconsistent & result in mostly small installations in the cloudiest places
- ▶ Very limited (almost non-existent) ability for customers to buy directly from offsite renewable facilities
- ▶ Oregon RPS will not drive much more investment over the next decade

But ...

- ▶ Hydro is limited and will not replace coal, nor support load growth
- ▶ Cost for renewables beats new fossil plants
- ▶ Innovative human capital base

What's Happening Now?

Solar Beats Fossil on Price

Utility Scale Solar: \$60 to \$86/MWh

Gas Combined Cycle: \$61 to \$127/MWh

- “Lazard’s Levelized Cost of Energy Analysis,” September 2014
(Unsubsidized Comparison)

Big Solar Delivered to Big Customers



Big Solar Delivered to Small Customers



Batteries and Solar?

Battery deployment starting to look a lot like solar!

- » California storage mandate (1,325 MW)
- » Behind the meter battery deployment (capacity charges)
- » Growth in niche markets
- » Elon Musk



Thank You