integratedpower

ISETA

Iowa Solar Energy Trade Association

PHOTOVOLTAICS_Nation/Iowa: solar market report/evolution

Tim Dwight

ISETA

Integrated Power

Solar_journey

1970

New silicon design brings cost down $100/w to $20/w

1980

ARCO Solar becomes first company to produce more than 1MW PV per year

1983

Global PV production surpasses 21.3 MW in field

1999

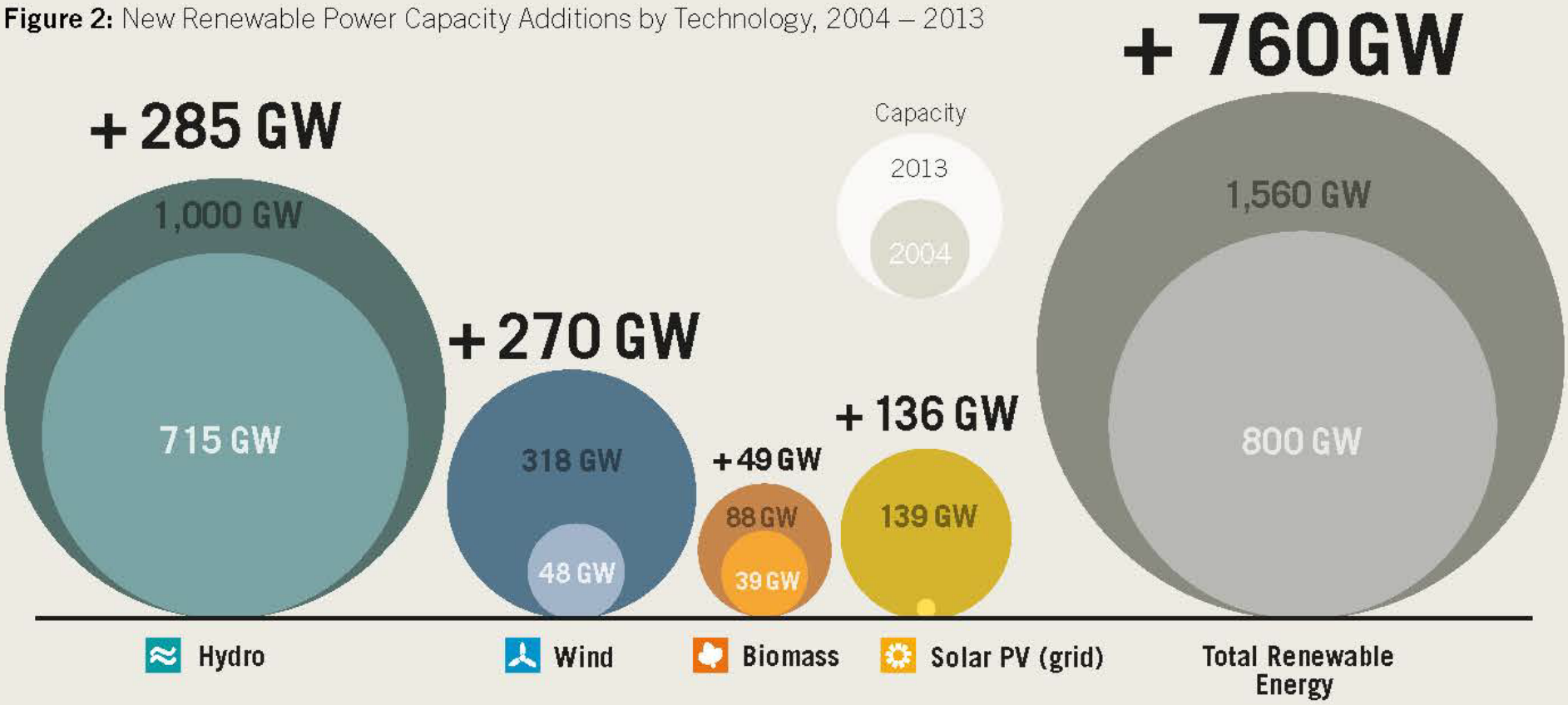
Global PV capacity reaches 1000 MW

2002

First 38.7-kilowatt station opens in Washington

Growth in RE/Solar Capacity

Figure 2: New Renewable Power Capacity Additions by Technology, 2004 – 2013



Note: Geothermal figures for 2004 and 2013 were 9 and 12 GW respectively. For CSP, capacity was 0.4 in 2004 and 3.4 GW in 2013. These amounts have been included in the Total Renewable Energy calculation.

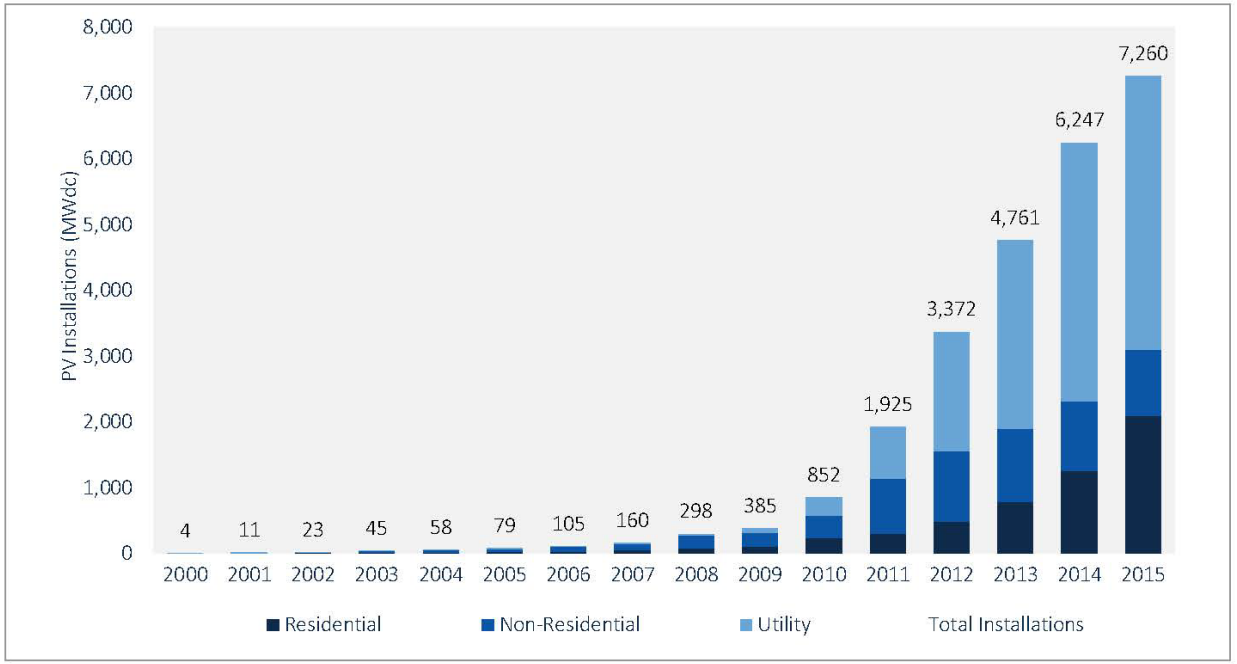
+ 233 GW 2015

Solar_15 years

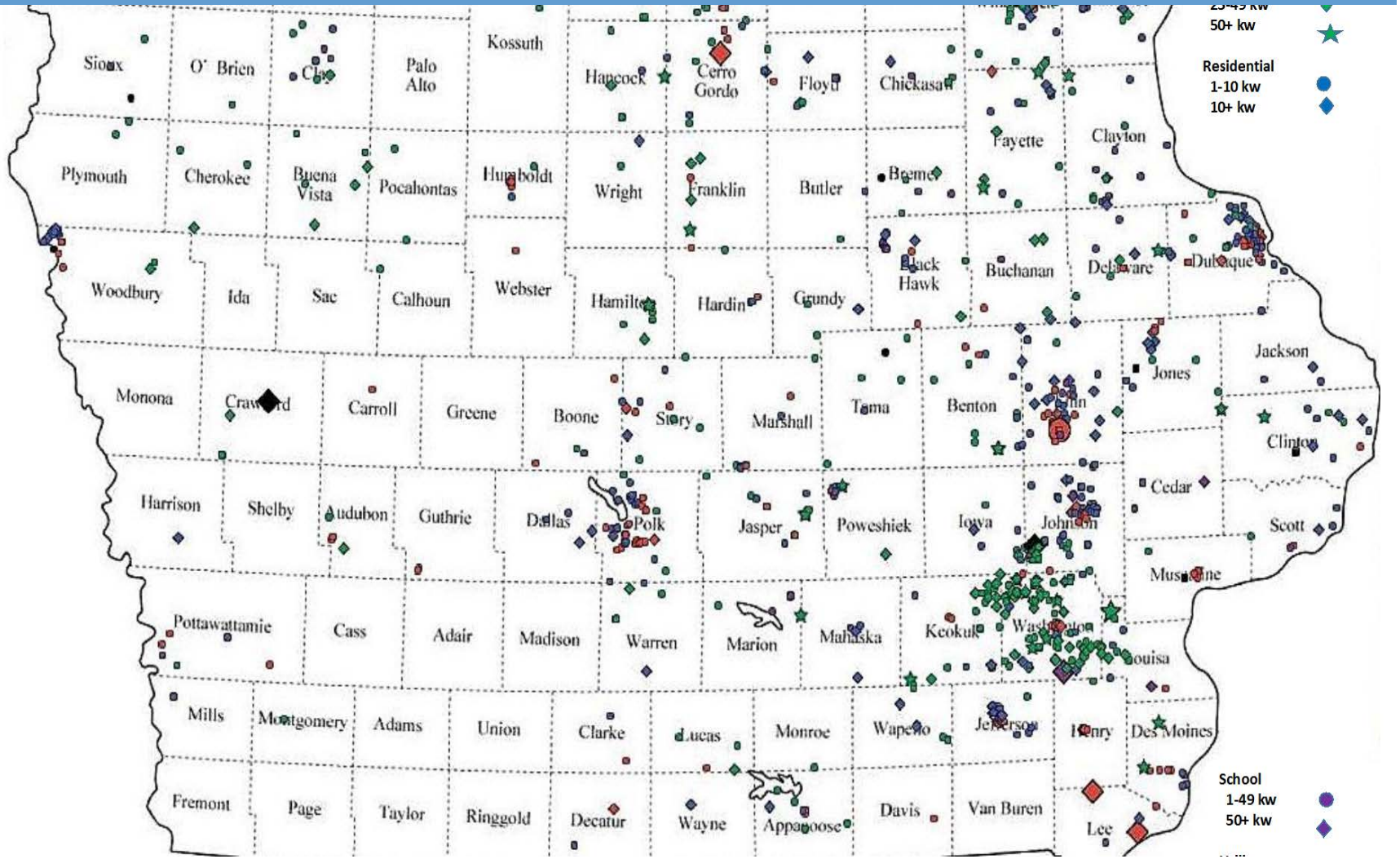
Nearly 1 MW of solar PV – enough to power more than 160 homes – was installed almost every hour in the US in 2015.

> $3
a watt

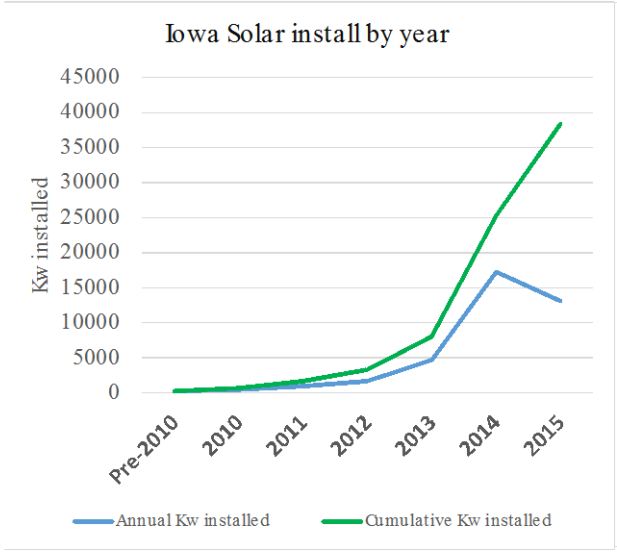
Figure 1.1 Annual U.S. Solar PV Installations, 2000-2015

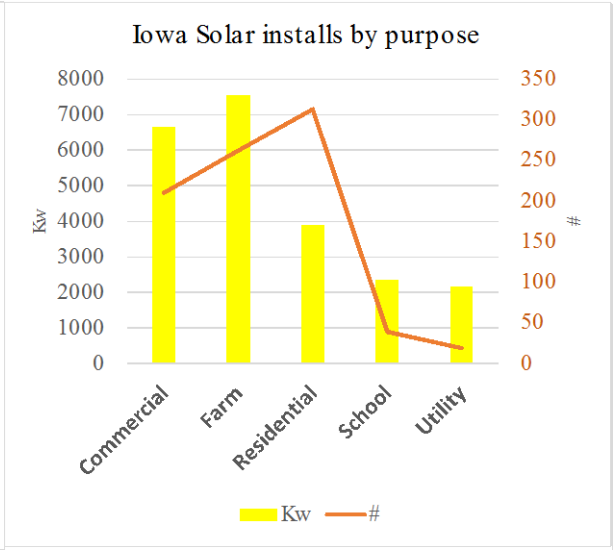


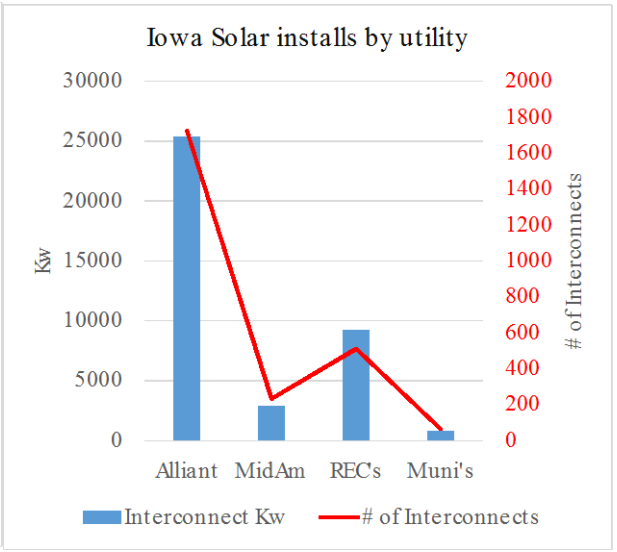
Solar_Iowa Counties



Solar_Iowa Metrics







Install breakdown by year

	#	Kw	Cum Kw
Pre-2010	78	260	260
2010	53	448	707
2011	60	957	1664
2012	193	1671	3336
2013	355	4694	8030
2014	1170	17248	25278
2015	637	13095	38373
Total	2,546	38,373	

Install breakdown by purpose

	#	Kw	Average	Largest install
Commercial	210	6661	31.7	500
Farm	262	7552	28.8	374
Residential	313	3905	12.5	63.8
School	39	2343	60.1	725.8
Utility	19	2181	114.8	797.5

School includes colleges and universities

The numbers in this chart and table are based on my verified data

Install breakdown by Utility

	#	Kw
Alliant	1725	25376
MidAm	232	2900
REC's	511	9276
Muni's	65	800
Off-Grid	13	21
Total	2,546	38,373

A few of these interconnects may be in 2016

Solar_Legislative Policies/Results

- Investment Tax Credit fund of $5 million. 50% of ITC. $5k Residential, $20k Commercial.
- Iowa's Solar installed capacity reaches 40MW (30MW DG) 2015.
- 476c- Production Tax Credit of $0.015/kWh – 20 MW of solar development. '15/'16
- Expansion of "community" solar gardens_REC's & Muni's, IOU's

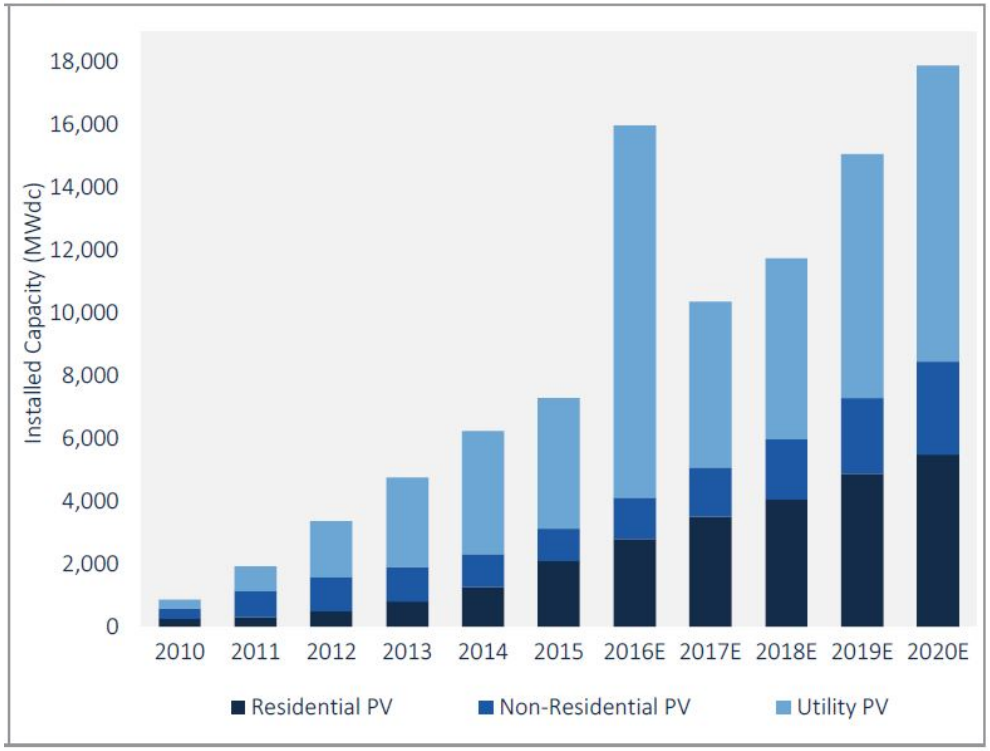
Community Solar Garden, Kalona IA

Solar_Adoption

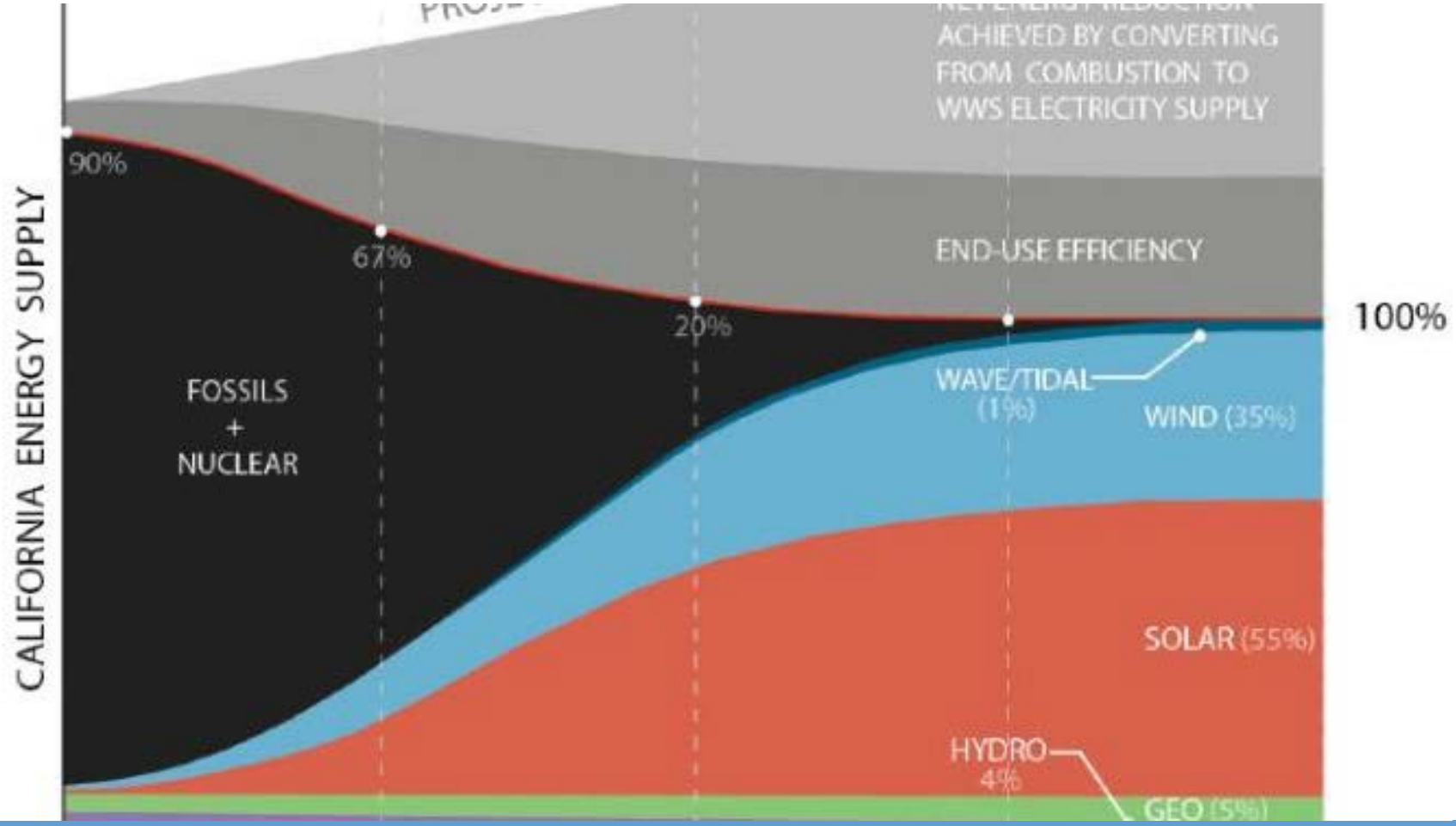
US Solar Market Set to Grow 119% in 2016

$2 ↓
a watt

Figure 1.5 U.S. PV Installation Forecast, Current



Solar_30,000’ View



Solar_“New” Rate Structure

MARKETS & POLICY

A Rising Tension: ‘Value-of-Solar’ Tariff Versus Net Metering

TASC members SolarCity, Sungevity, Sunrun and Verengo are battling to keep net energy metering intact.

by Herman K. Trabish
April 10, 2014

Nevada's perplexing war on solar - CNN

Solar_Storage Solutions

- Enter storage
- Solar as baseload
- More Flexibility
- Increase “real time”
- Increased Efficiency

Solar_VOST

How the Value of Solar Tariff (VOST) works in Austin, TX

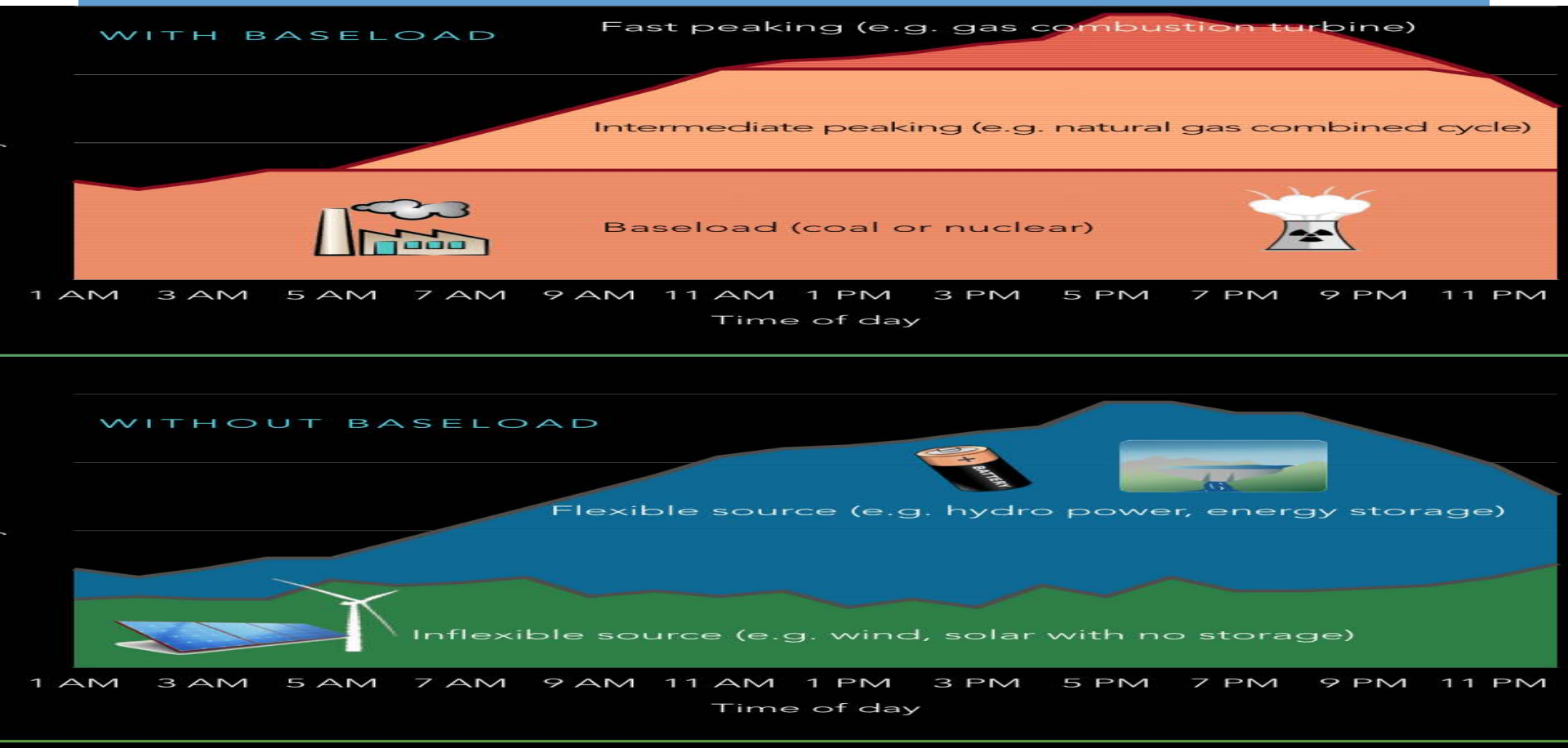
You pay the utility company your regular residential rate for each kWh you use

Utility pays you 11.3¢ for every kWh you produce!

VOST_value of solar

- Methodology
- All Stakeholders
- Efficincey First
- DG – increase
- EV's
- Storage
- Grid modernization – "real time"
- Utility Business evolution - Change

Solar_Static to Dynamic



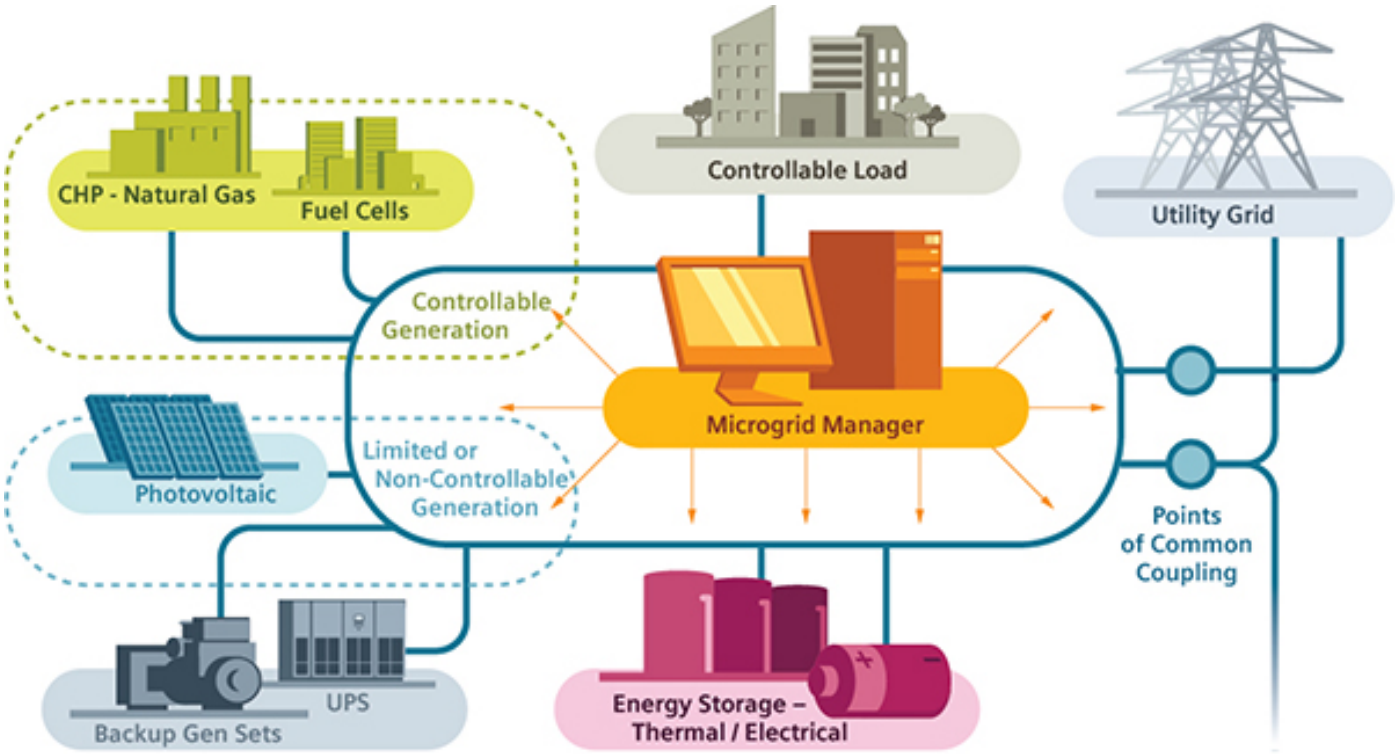
mand for electricity changes throughout the day, peaking in late afternoon. Demand is usually met by a
nbination of continuous baseload power (e.g. coal or nuclear) and additional power from other sources as
uired. But baseload is not essential for meeting demand. The same demand profile can be met by a
nbination of sources that can store power (flexible) and those that can't (inflexible).

ISR INSTITUTE FOR Local Self-Reliance

Adapted from David Mills: http://www.abc.net.au/science/articles/2010/12/02/3081889.ht

Solar_Modernization

Microgrid_New Energy Paradigm



5kw_small farm

10kw_residence

60kw_Commercial

40kw_Agriculture

200kw_canopy

1MW Community Solar/Utility

FEC_800kw

The Squad

Solar Thermal

Contact Info

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