

AGENDA



GREEN PRACTICES COMMISSION MEETING

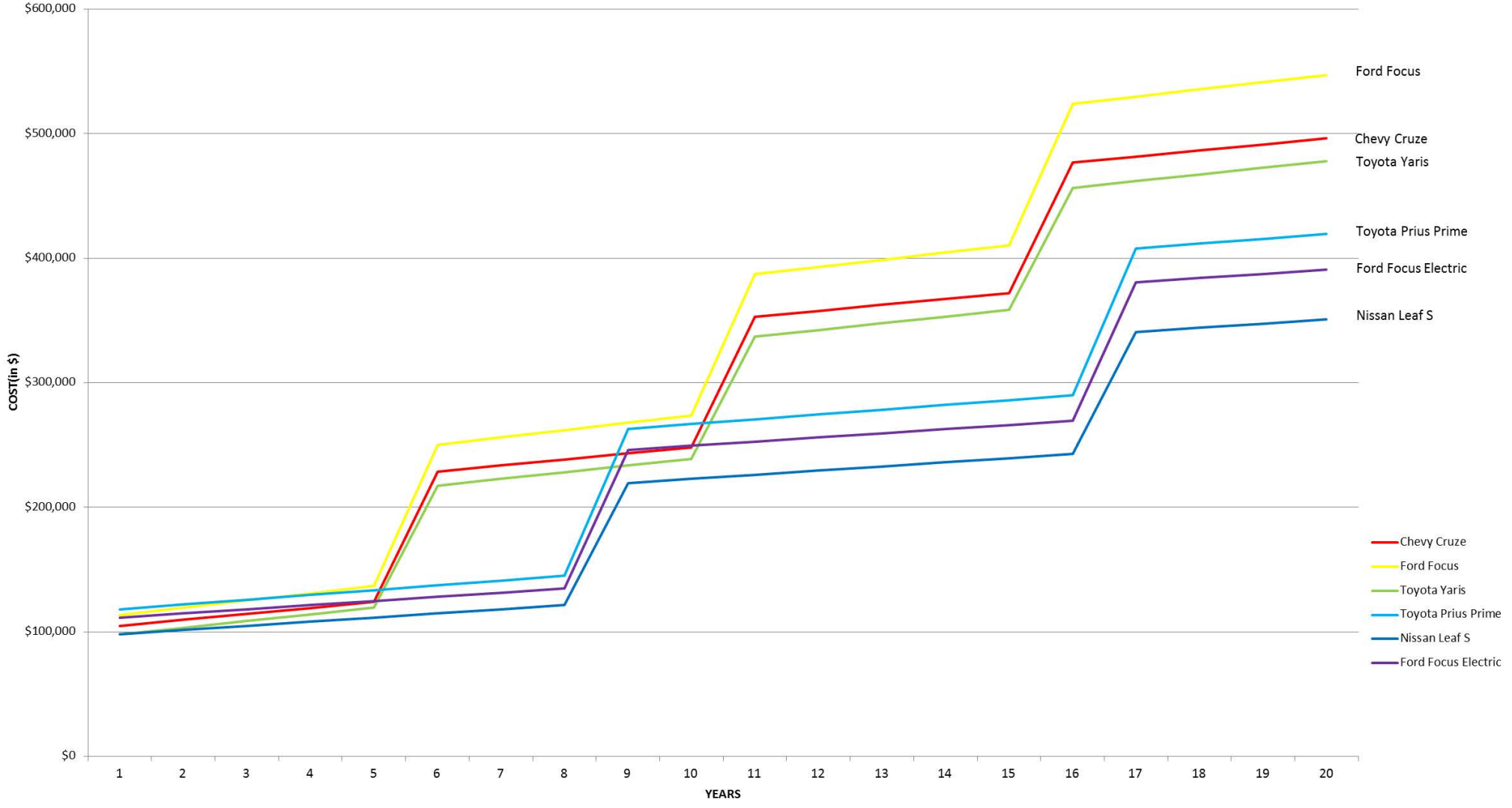
Thursday April 11, 2019 5:30 – 7:00 p.m.

Heman Park Community Center, 975 Pennsylvania Avenue

1. Roll Call
2. Opening Round
3. Approval of Minutes
 - a. 3/14/19 Green Practices Commission Meeting Minutes
4. Special Presentations
 - a. Public Comments (Limited to 3 minutes for individual's comments and 5 minutes for representatives of groups or organizations)
5. New Business
 - a. Litter
 - b. Solar Group Program
 - c. Inspector vehicles
6. Old Business
 - a. Recycling Update
 - b. Sustainable Developmental Guidelines Endorsement
7. Council Liaison Update
8. Closing Round
9. Adjournment

				YEAR												
				1	2	3	4	5	6	7	8	9	10	11		
MODEL	60 mo/100,000 mile powertrain warranty	Chevy Cruze Gasoline Car	Initial Cost (x5)	\$100,000						\$100,000					\$100,000	
			Maintenance and Repairs Cost	\$2,500	\$2,500	\$2,500	\$2,500	\$2,500	\$2,500	\$2,500	\$2,500	\$2,500	\$2,500	\$2,500	\$2,500	\$2,500
			Annual Gasoline Cost	\$2,309	\$2,309	\$2,309	\$2,309	\$2,309	\$2,309	\$2,309	\$2,309	\$2,309	\$2,309	\$2,309	\$2,309	\$2,309
			Annual Cost	\$104,809	\$4,809	\$4,809	\$4,809	\$4,809	\$104,809	\$4,809	\$4,809	\$4,809	\$4,809	\$4,809	\$4,809	\$104,809
			Cumulative Cost	\$104,809	\$109,617	\$114,426	\$119,234	\$124,043	\$228,851	\$233,660	\$238,468	\$243,277	\$248,085	\$248,085	\$248,085	\$352,894
		Ford Focus Gasoline Car	Initial Cost (x6)	\$107,700							\$107,700					\$107,700
			Maintenance and Repairs Cost	\$2,500	\$2,500	\$2,500	\$2,500	\$2,500	\$2,500	\$2,500	\$2,500	\$2,500	\$2,500	\$2,500	\$2,500	\$2,500
			Annual Gasoline Cost	\$3,324	\$3,324	\$3,324	\$3,324	\$3,324	\$3,324	\$3,324	\$3,324	\$3,324	\$3,324	\$3,324	\$3,324	\$3,324
			Annual Cost	\$113,524	\$5,824	\$5,824	\$5,824	\$5,824	\$113,524	\$5,824	\$5,824	\$5,824	\$5,824	\$5,824	\$5,824	\$113,524
			Cumulative Cost	\$113,524	\$119,348	\$125,173	\$130,997	\$136,821	\$250,345	\$256,170	\$261,994	\$267,818	\$273,642	\$273,642	\$273,642	\$387,167
		Toyota Yaris Gasoline Car	Initial Cost (x6)	\$92,700							\$92,700					\$92,700
			Maintenance and Repairs Cost	\$2,500	\$2,500	\$2,500	\$2,500	\$2,500	\$2,500	\$2,500	\$2,500	\$2,500	\$2,500	\$2,500	\$2,500	\$2,500
			Annual Gasoline Cost	\$2,863	\$2,863	\$2,863	\$2,863	\$2,863	\$2,863	\$2,863	\$2,863	\$2,863	\$2,863	\$2,863	\$2,863	\$2,863
			Annual Cost	\$98,063	\$5,363	\$5,363	\$5,363	\$5,363	\$98,063	\$5,363	\$5,363	\$5,363	\$5,363	\$5,363	\$5,363	\$98,063
			Cumulative Cost	\$98,063	\$103,425	\$108,788	\$114,150	\$119,513	\$217,575	\$222,938	\$228,300	\$233,663	\$239,025	\$239,025	\$239,025	\$337,088
MODEL	96 mo/100,000 mile electric hybrid warranty	Chevy Volt Hybrid Car	Initial Cost (w/ incentives) (x4)	\$119,080										\$134,080		
			Maintenance and Repairs Cost	\$2,400	\$2,400	\$2,400	\$2,400	\$2,400	\$2,400	\$2,400	\$2,400	\$2,400	\$2,400	\$2,400	\$2,400	
			Annual Electric and Gasoline Cost	\$1,372	\$1,372	\$1,372	\$1,372	\$1,372	\$1,372	\$1,372	\$1,372	\$1,372	\$1,372	\$1,372	\$1,372	
			Annual Cost	\$122,852	\$3,772	\$3,772	\$3,772	\$3,772	\$3,772	\$3,772	\$3,772	\$3,772	\$137,852	\$3,772	\$3,772	
			Cumulative Cost	\$122,852	\$126,623	\$130,395	\$134,166	\$137,938	\$141,709	\$145,481	\$149,253	\$287,104	\$290,876	\$294,647	\$294,647	
		Cumulative Savings (Against Toyota Yaris)	-\$24,789	-\$23,198	-\$21,607	-\$20,016	-\$18,425	\$75,866	\$77,457	\$79,048	-\$53,441	-\$51,850	\$42,441	\$42,441		
		Ford Fusion Energi Hybrid Car	Initial Cost (w/ incentives) (x4)	\$119,944											\$119,944	
			Maintenance and Repairs Cost	\$2,400	\$2,400	\$2,400	\$2,400	\$2,400	\$2,400	\$2,400	\$2,400	\$2,400	\$2,400	\$2,400	\$2,400	
			Annual Electric and Gasoline Cost	\$1,447	\$1,447	\$1,447	\$1,447	\$1,447	\$1,447	\$1,447	\$1,447	\$1,447	\$1,447	\$1,447	\$1,447	
			Annual Cost	\$123,791	\$3,847	\$3,847	\$3,847	\$3,847	\$3,847	\$3,847	\$3,847	\$3,847	\$123,791	\$3,847	\$3,847	
			Cumulative Cost	\$123,791	\$127,638	\$131,485	\$135,332	\$139,179	\$143,026	\$146,873	\$150,720	\$274,510	\$278,357	\$282,204	\$282,204	
		Cumulative Savings (Against Toyota Yaris)	-\$25,728	-\$24,213	-\$22,697	-\$21,182	-\$19,666	\$74,550	\$76,065	\$77,581	-\$40,848	-\$39,332	\$54,884	\$54,884		
		Toyota Prius Prime Hybrid Car	Initial Cost (w/ incentives) (x5)	\$114,240											\$114,240	
			Maintenance and Repairs Cost	\$2,400	\$2,400	\$2,400	\$2,400	\$2,400	\$2,400	\$2,400	\$2,400	\$2,400	\$2,400	\$2,400	\$2,400	
			Annual Electric Cost	\$1,434	\$1,434	\$1,434	\$1,434	\$1,434	\$1,434	\$1,434	\$1,434	\$1,434	\$1,434	\$1,434	\$1,434	
Annual Cost	\$118,074		\$3,834	\$3,834	\$3,834	\$3,834	\$3,834	\$3,834	\$3,834	\$3,834	\$118,074	\$3,834	\$3,834			
Cumulative Cost	\$118,074		\$121,908	\$125,742	\$129,577	\$133,411	\$137,245	\$141,079	\$144,913	\$262,987	\$266,822	\$270,656	\$270,656			
Cumulative Savings (Against Toyota Yaris)	-\$20,012	-\$18,483	-\$16,955	-\$15,426	-\$13,898	\$80,330	\$81,859	\$83,387	-\$29,325	-\$27,796	\$66,432	\$66,432				
Nissan Leaf S Electric Car	Initial Cost (w/ incentives, including Ameren Incentive) (x5)	\$94,950											\$94,950			
	Maintenance and Repairs Cost	\$2,400	\$2,400	\$2,400	\$2,400	\$2,400	\$2,400	\$2,400	\$2,400	\$2,400	\$2,400	\$2,400	\$2,400			
	Annual Electric Cost	\$900	\$900	\$900	\$900	\$900	\$900	\$900	\$900	\$900	\$900	\$900	\$900			
	Annual Cost	\$98,250	\$3,300	\$3,300	\$3,300	\$3,300	\$3,300	\$3,300	\$3,300	\$3,300	\$98,250	\$3,300	\$3,300			
	Cumulative Cost	\$98,250	\$101,550	\$104,850	\$108,150	\$111,450	\$114,750	\$118,050	\$121,350	\$219,600	\$222,900	\$226,200	\$226,200			
Cumulative Savings (Against Toyota Yaris)	-\$187	\$1,875	\$3,938	\$6,000	\$8,063	\$102,825	\$104,888	\$106,950	\$14,063	\$16,125	\$110,888	\$110,888				
Ford Focus Electric Electric Car	Initial Cost (w/ incentives) (x5)	\$108,100											\$108,100			
	Maintenance and Repairs Cost	\$2,400	\$2,400	\$2,400	\$2,400	\$2,400	\$2,400	\$2,400	\$2,400	\$2,400	\$2,400	\$2,400	\$2,400			
	Annual Electric Cost	\$930	\$930	\$930	\$930	\$930	\$930	\$930	\$930	\$930	\$930	\$930	\$930			
	Annual Cost	\$111,430	\$3,330	\$3,330	\$3,330	\$3,330	\$3,330	\$3,330	\$3,330	\$3,330	\$111,430	\$3,330	\$3,330			
	Cumulative Cost	\$111,430	\$114,760	\$118,090	\$121,420	\$124,750	\$128,080	\$131,410	\$134,740	\$246,170	\$249,500	\$252,830	\$252,830			
Cumulative Savings (Against Toyota Yaris)	-\$13,367	-\$11,335	-\$9,302	-\$7,270	-\$5,237	\$89,495	\$91,528	\$93,560	-\$12,507	-\$10,475	\$84,258	\$84,258				

Cost Comparison Between Selected Gasoline, Hybrid, and Electric Vehicles





Department of Public Works and Parks

6801 Delmar Boulevard, University City, Missouri 63130, Phone: (314) 505-8560, Fax: (314) 862-0694

MEMORANDUM

TO: Green Practices Commission
FROM: Jenny Wendt – Project Manager
MEETING DATE: March 14, 2019
SUBJECT: Update on projects related to sustainability

Please see below for an update on all of the current sustainability related projects for the Department of Public Works and Parks:

- The City is considering alternative fuel vehicles for the inspectors for FY20. A preliminary cost analysis has shown that electric vehicles are the most cost effective choice.
- April 13th has been designated as “Plastic Bag Awareness Day” with many stores and Business Districts participating in this initiative. Pete’s Market and the Loop Business District are partners.
- There will be a small Earth Day Event on April 22nd from approximately 3 – 6pm at City Hall.
- The Green Practices Commission heard a presentation on “Solarize U City”, a program to educate and provide opportunity for group solar discounts for residents. It would be supported by the City but run by a selected solar provider (through an RFP process) and community advocates.
- Retrofits of fluorescent tubes in the Delmar Parking Garage will begin soon; the project has a 10 month ROI.
- A quote for retrofits of fluorescent tubes in the Community Center has been received. Bids will be requested by other lighting companies.
- The Sustainable Developmental Guidelines have been created, endorsed by the Green Practices Commission, and reviewed by the Traffic Commission, Plan Commission, and the Stormwater Task Force. A draft resolution for the City’s adoption of the guidelines has been created and is under review with the intent to submit to Council for approval in March or April 2019.
- 2017 Solid Waste Management District Grant: \$50,000 was awarded; 95 gallon recycling carts were purchased to replace smaller recycling carts. A recycling education insert went out with the May/June 2018 ROARS newsletter using grant funds. Next is working on an updated recycling education brochure and recycling contamination education material.
- 2018 St. Louis Jefferson Solid Waste Management District Waste Reduction Grant: The City was awarded \$20,000 for a free “CRT TV Takeback” in coordination with a biannual electronics recycling event. The grant includes funding toward advertisement, education, and the cost of TV recycling. Money left from this grant will go toward the May 2019 4 electronics recycling event.
- University City has hired a summer intern through Washington University’s Environmental Studies Community Internship Program.

- Transportation Alternative Program Grant Application: Staff is proceeding with the TAP project updating the lighting to LED and creating ADA access along Ackert Walkway and through Ackert Park. Council has approved the project. The preliminary design is substantially completed.
- University City is part of a regional group working on regional recycling education and standardizing the recycling message. The main goals of the group are Education/Communication, Policy, and Business Development; with the first action items as follows:
 - Create and distribute a common list of recyclables (COMPLETE)
 - Create a regional database of where to recycle non-single stream items. This database will include locations in the 7 counties and St. Louis City. (COMPLETE)
 - Communicate and distribute message and a toolkit to municipalities. (Ongoing)

The group received \$125K for a 2018 St. Louis Jefferson Solid Waste Management District Waste Reduction Grant for mass distribution of the standard message of single stream recycling and education and outreach regarding basic recycling and the problems with plastic bags. The majority of the funding has gone toward a PR firm specializing in this messaging.

- MS4: (municipal separate storm sewer system). University City is working with MSD to comply with a series of Best Management Practices to and other regulations to decrease stormwater and its pollution. Ordinances have been created to meet the MS4 requirements; the Stormwater Task Force is determining further requirements based on University City needs.
- Diversion of maintenance yard stormwater runoff from the River Des Peres to a combination sewer line is underway through a project replacing a pump in the transfer station.
- A University City Staff Green Team has begun working by determining areas of improvement through the City.
- Improvements for cardboard collection are underway to alleviate the high volume of cardboard recycling that has occurred since the drop-off area was renovated. This is intended to relieve overflow and reduce labor needed to keep up with the load. In addition, additional promotion of the drop-off will be provided to businesses once the upgrades to the drop-off area are completed.
- Retro-commissioning of Firehouse #1 has been completed. HVAC improvements have been recommended for FY20 but were not approved.
- All interior lighting in Firehouses #1 and #2 have been upgraded to LED. Exterior lighting for the firehouses will be completed soon.
- A grant has been awarded and will be submitted to council for approval to determine the feasibility of returning the former Materials Recovery Facility (MRF) to its original function of sorting recyclables in-house instead of taking them to Republic Services for sorting and sales.
- The City Council has endorsed the City becoming a “Shining City”. Mayor Crow signed the “Mayors for Solar Energy” Statement of Support. The City will begin solar support efforts.
- University City is working with The Loop to reduce idling. Various property owners have installed “No Idling” signs given to the City by the American Lung Association.



Green Practices Commission

6801 Delmar Boulevard, University City, Missouri 63130, Phone: (314) 862-6767, Fax: (314) 863-9146

Meeting Minutes –
March 14, 2019 **DRAFT**

University City Green Practices Commission

Location:

Heman Park Community Center

Attendees Present:

John Solodar (Chairperson), Liz Essman, Barbara Brain, Adam Staudt,
Jonathan Stitelman, Tim Cusick (Council Liaison), Jenny Wendt (Staff Liaison),
Adam Brown (Staff)

Attendees Absent:

Mary Gorman

1. Meeting called to order, Roll Call 5:33pm
2. Opening Round
 - a. Partners for Native Landscaping workshop scheduled for March 29th at the Danforth Plant Science Center.
3. Approval of Minutes
 - a. 02/14/19 Green Practices Commission Meeting Minutes were approved with one minor edit.
4. Special Presentations: Straight-Up Solar: Solar information on City Buildings and “Solarize U City” program. Steve O’Rourke and Eric Schneider presented about Solar and specifically about a “Solarize U City” program. See attached presentation.
The “Solarize U City” program would be supported by the City but championed by community members.
5. New Business
 - a. Tree discussion: Barbara attended a US Green Building Council event – “Calculating the Benefits of Trees” and reported on this event as well as general information on the benefit of trees. See attached information sheet.
 - b. Plastic Bag Awareness Day: April 13th has been designated as “Plastic Bag Awareness Day” in the region. Pete’s Market and the Loop are both partnering in the initiative, as well as several stores and business districts throughout the region.
6. Old Business
 - a. Strategic Plan Update Strategy: The commission will tackle the topics in the Strategic Plan one at a time instead of trying to update the plan as a whole. The first topic will be the topic of Education and Advocacy.
 - b. Glass and Mixed Paper Drop-Off Location Update: This project has been tabled. The grant funds will not be accepted.
 - d. Sustainable Developmental Guidelines Update: A resolution is being developed for the City to adopt the Sustainable Development Guidelines.

7. Council Liaison Update: Tim Cusick –
 - a. The city is trying to determine a better balance with Washington University.
 - b. Better Together: The initiative is still proceeding; Tim brought the petition for the formation of the Board of Freeholders if anyone would like to sign it.
 - c. State Loan: No new projects for the state loan funding are on hold partially because of the Better Together initiative.
8. Closing Round: None
9. Adjournment at 6:58 pm

DRAFT

Saving with Solar



March 14, 2019

University City Green Practices Commission

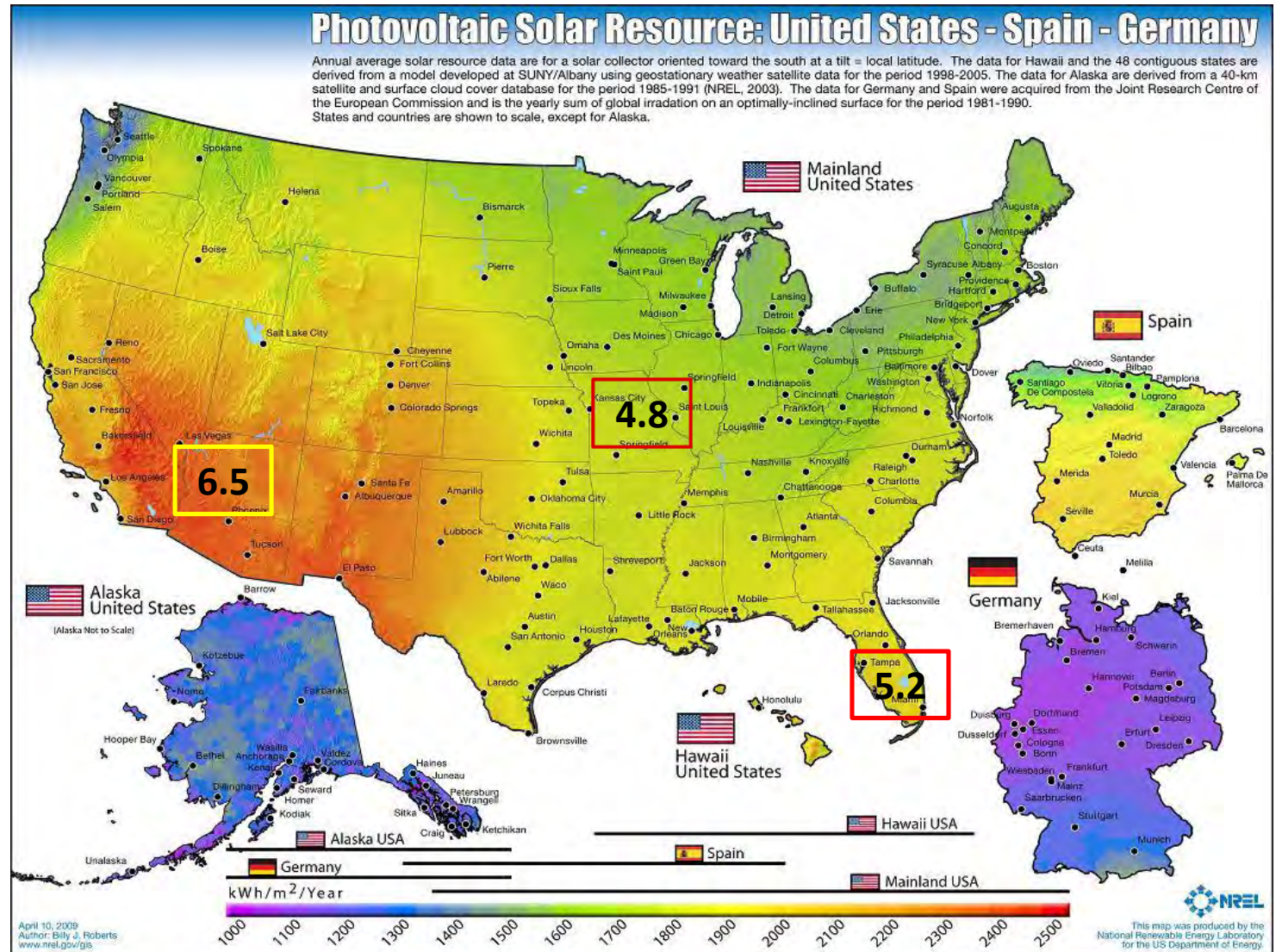
Steve O'Rourke



StraightUp
SOLAR

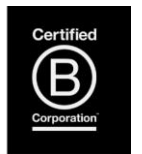
Solar as a Resource

*In an **hour**, more sunlight falls on the earth than what is used by the entire population in a **year***



StraightUp Solar

- Established in 2006
- HQ in St. Louis, with offices in Bloomington-Normal and Swansea, IL
- 65+ employees
- Over 1,100 installations
- 11 MW, including residential & commercial
- Member of Amicus solar cooperative to secure best pricing
- Certified B-Corp with triple bottom line focus



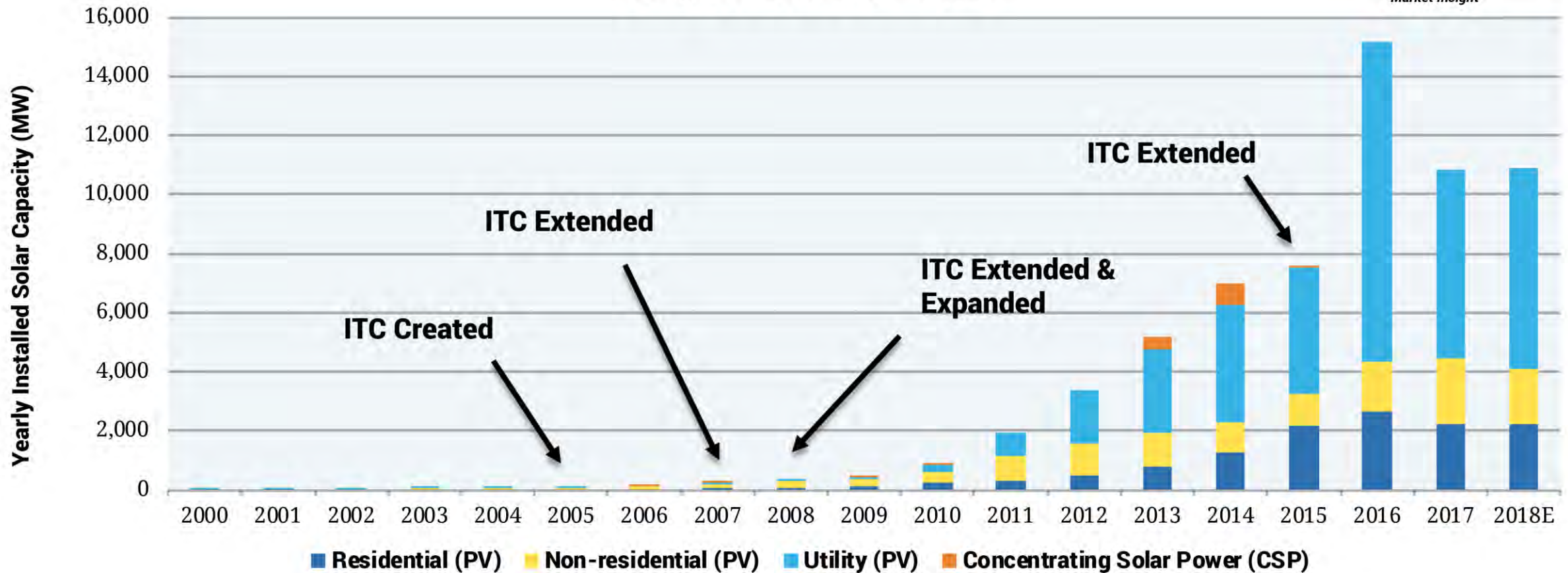


**THE SOLAR
INDUSTRY IS
BOOMING!**

Solar Investment Tax Credit

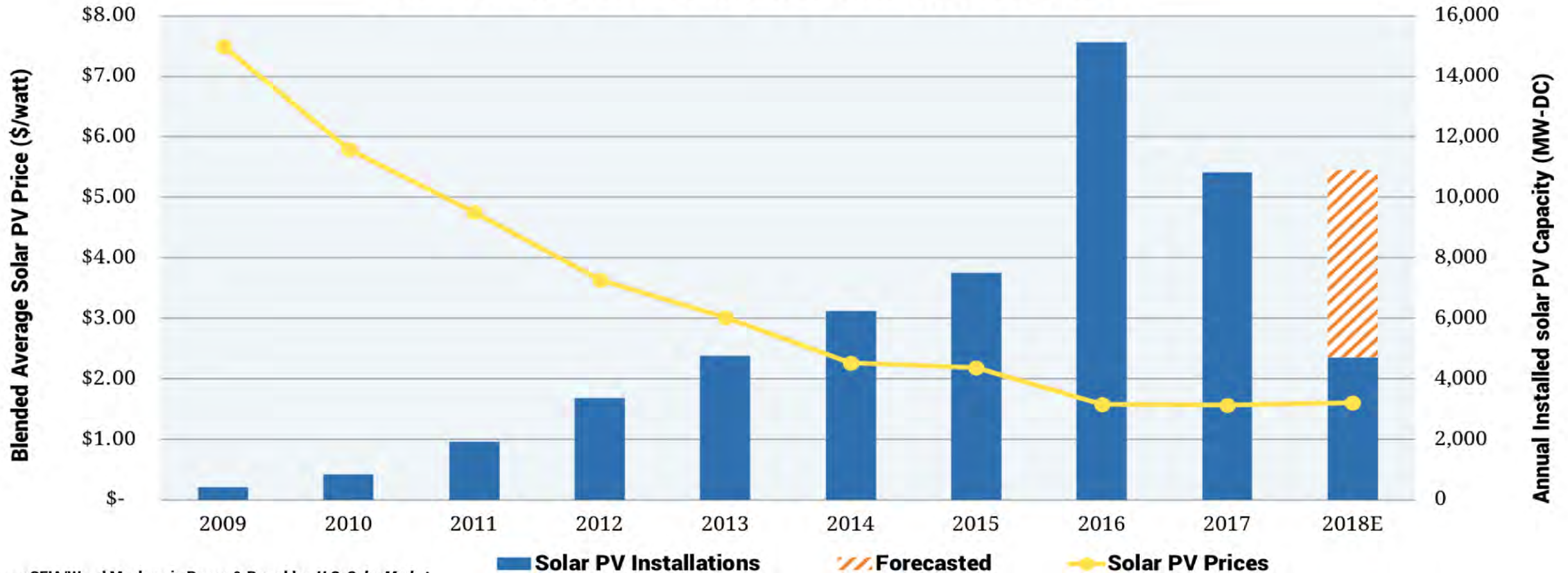
Yearly U.S. Solar Installations

Source: SEIA/Wood Mackenzie Power & Renewables U.S. Solar Market Insight



Growth in Solar Led by Falling Prices

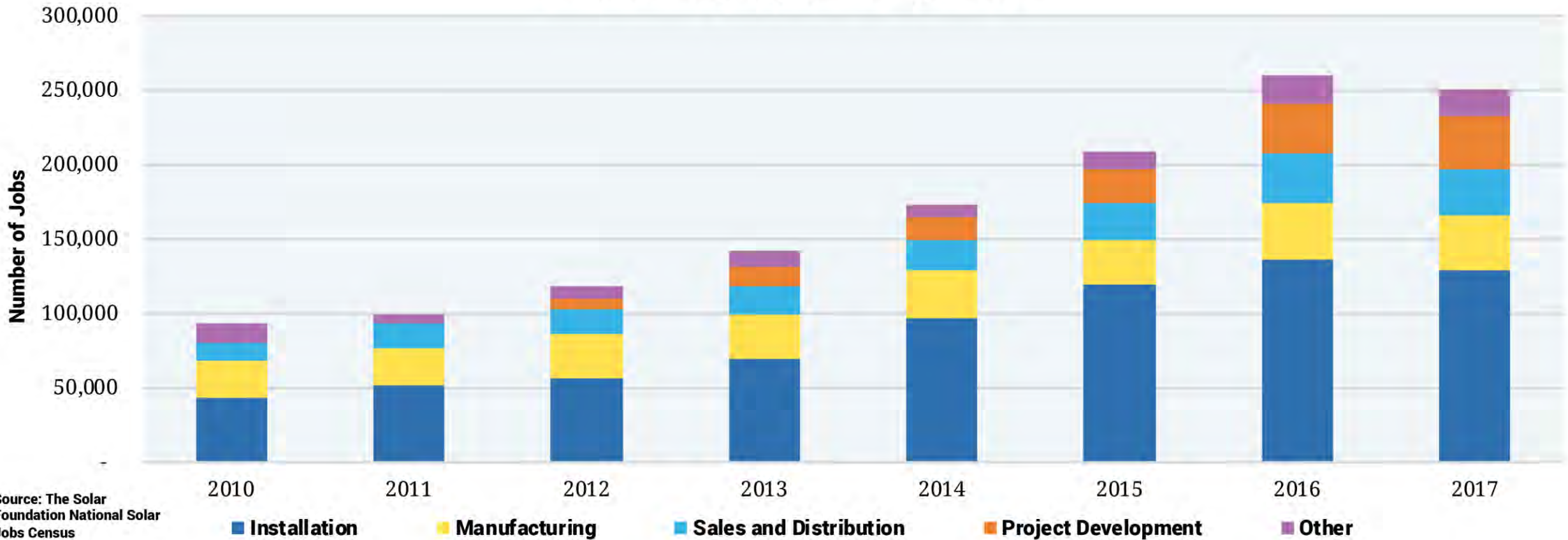
Annual Solar PV Installations and Blended Average PV Prices



Source: SEIA/Wood Mackenzie Power & Renewables U.S. Solar Market Insight; Lawrence Berkeley National Laboratory, Tracking the Sun

Solar as an Economic Engine

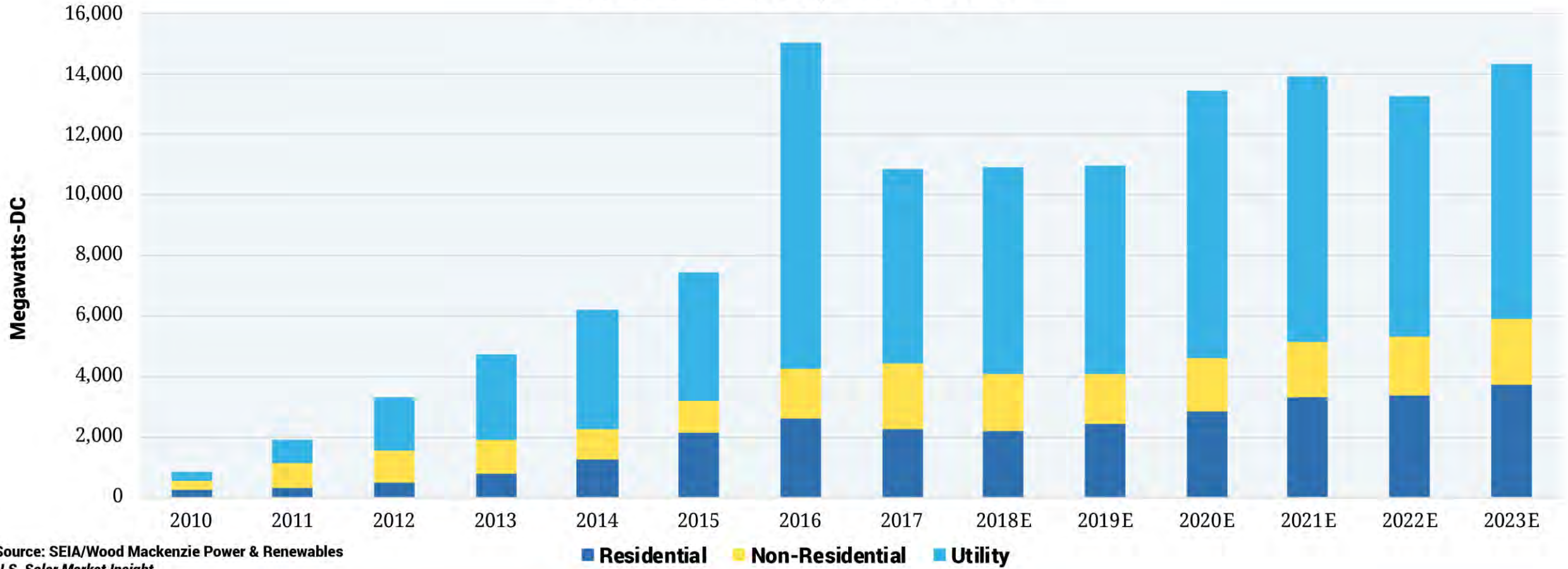
Solar Industry Employment by Sector



Source: The Solar Foundation National Solar Jobs Census

Solar PV Growth Forecast

U.S. Solar PV Deployment Forecast



Source: SEIA/Wood Mackenzie Power & Renewables
U.S. Solar Market Insight

■ Residential ■ Non-Residential ■ Utility

U.S. Solar Market Through Q2 2018: Key Takeaways

- **Over 58 GW installed**
 - Average annual growth rate of **59%** over the last 10 years
 - Enough electricity to power **11 million homes**
- **Over 74 M metric tons of CO2 offset annually** *equivalent to:*
 - Taking **15.8 million vehicles** off the road
 - Planting **1.9 billion trees**



U.S. Solar Market Through Q2 2018: Key Takeaways

- **A new solar project installed every 100 seconds**
 - 2013: **3,000 MW** installed
 - 2018: **>10,000 MW** installed
- **Over 1.8 M solar installations**
 - 2016: 1 million installations
 - Late 2018: 2 million
 - 2023: 4 million

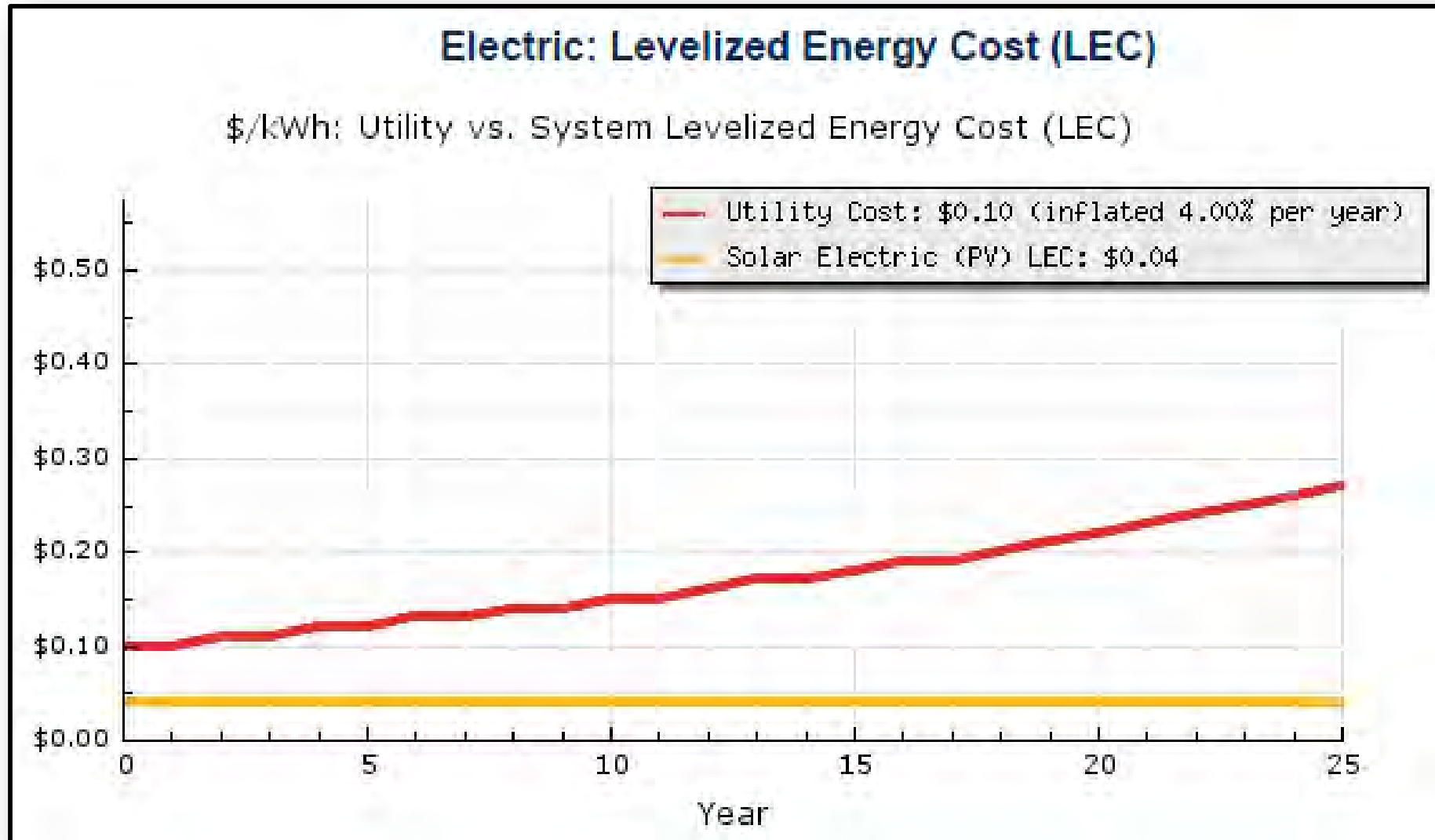


Why is Solar so Popular?

- Energy independence
- Cost-effective
- Use clean energy vs. burning fossil fuels
- Simple, low maintenance
- Rising utility rates



Hedge Against Rising Electricity Costs

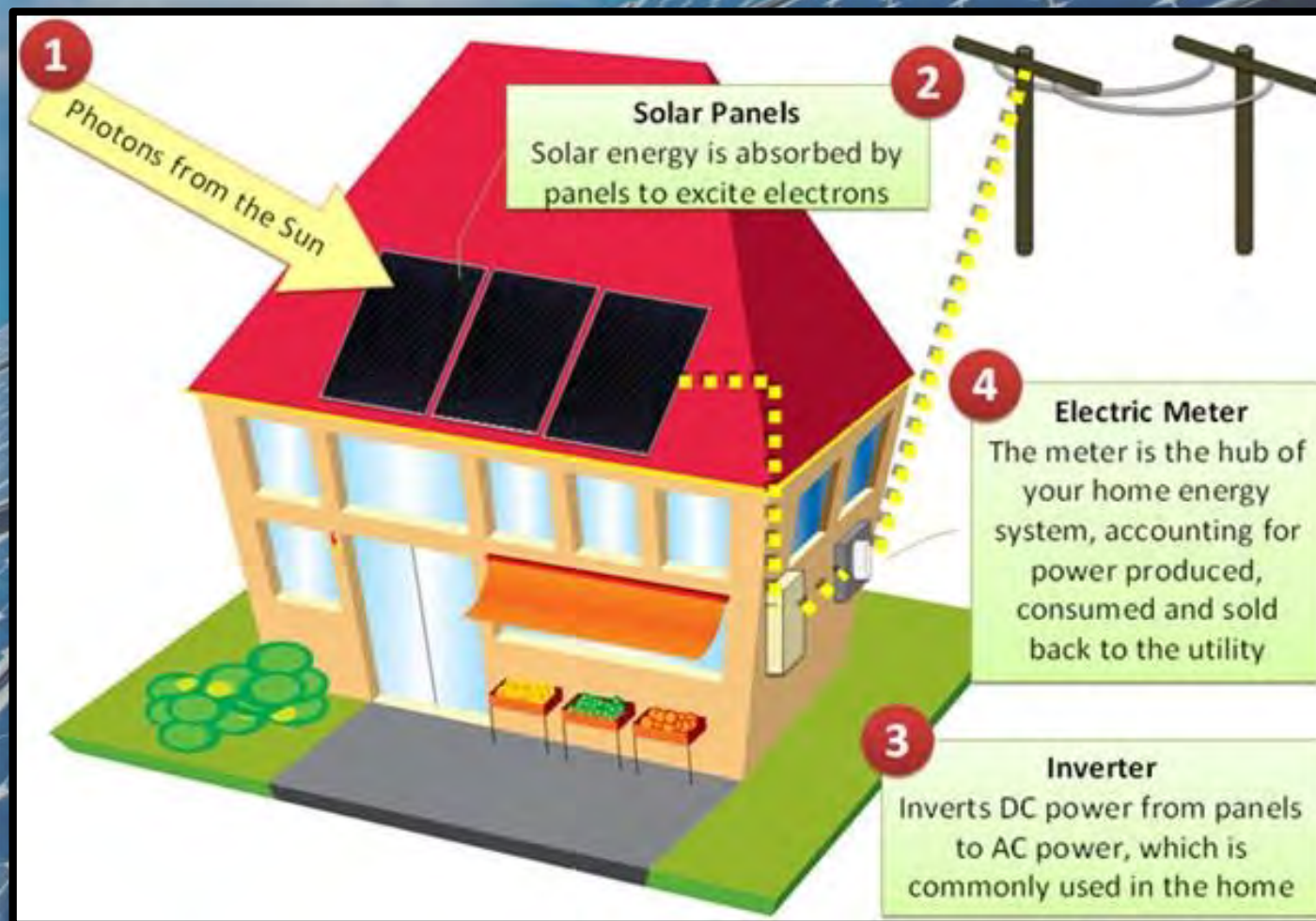


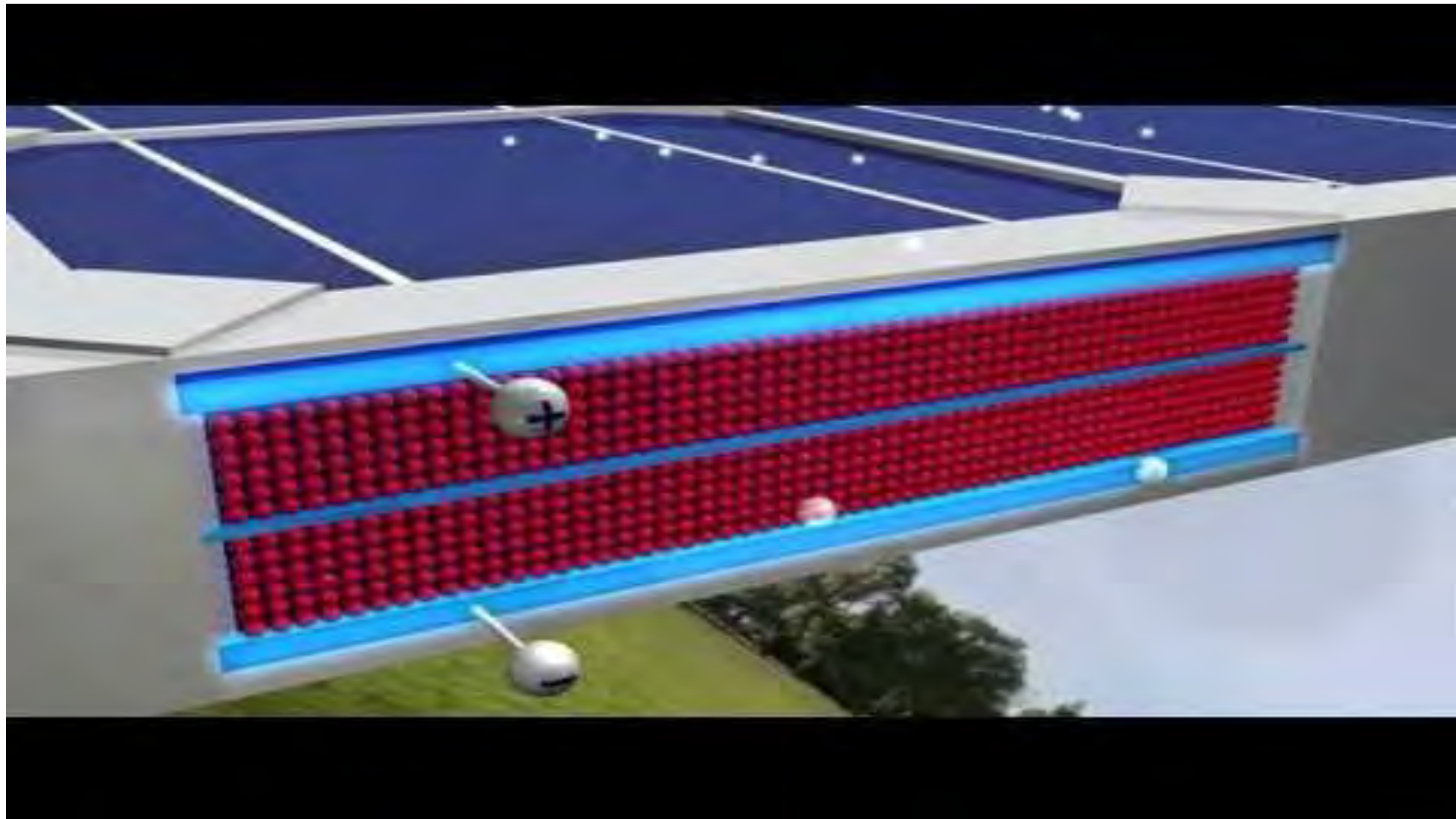
Two Types of Solar Energy

- **Solar Thermal** – transfer heat to water or air
- **Solar Photovoltaic (PV)** – convert light to electricity

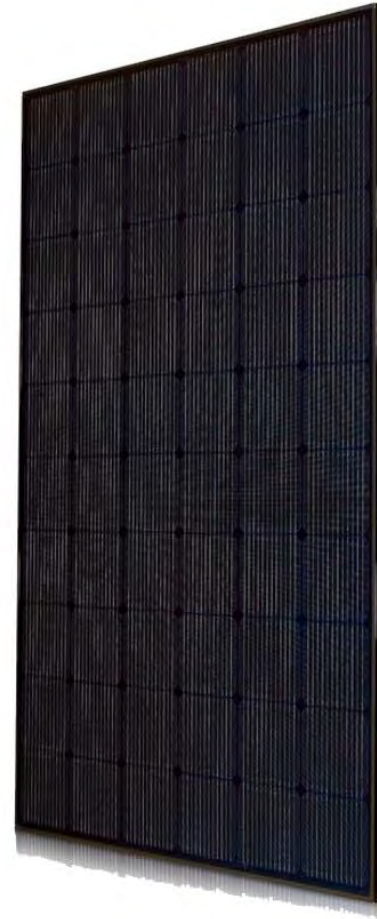


How does Solar PV Work?



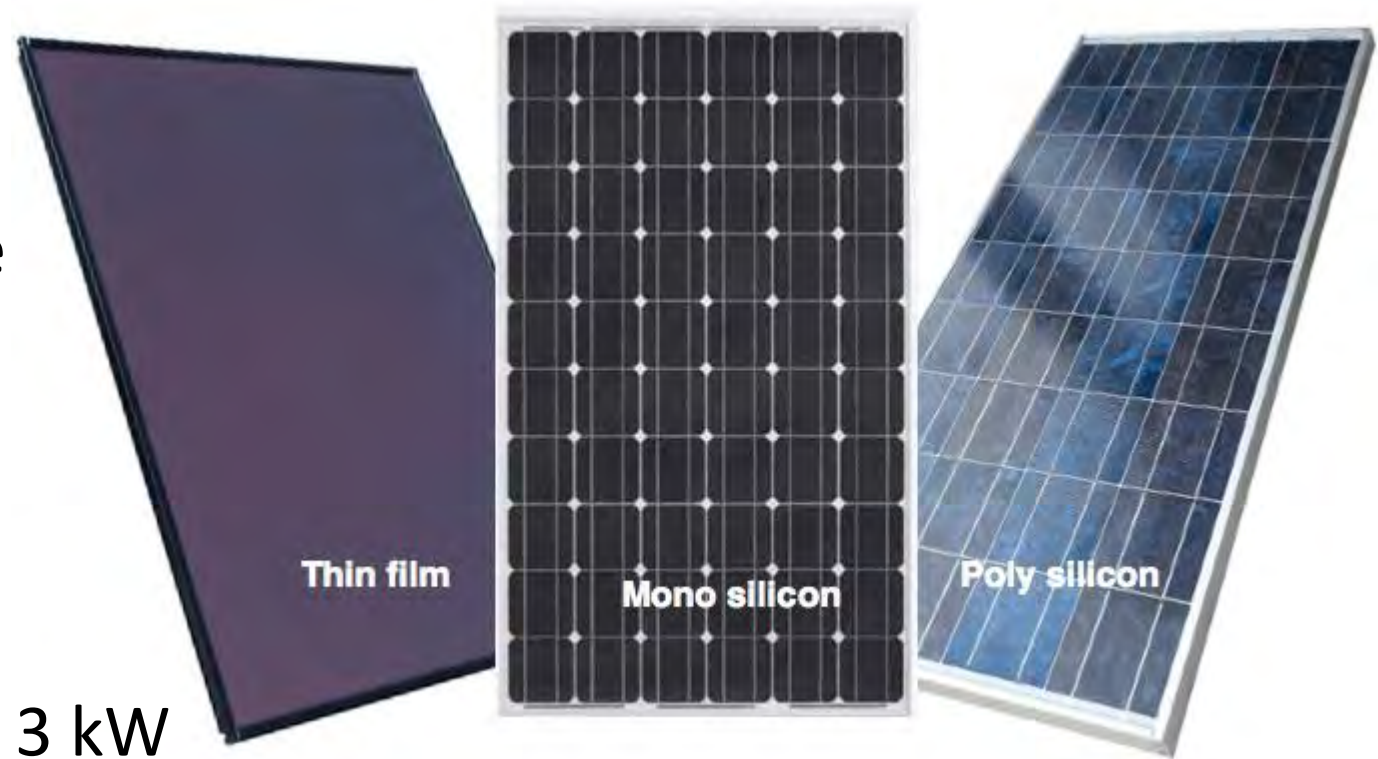


Solar Modules



Solar Modules

- Crystalline silicon (CSi) vs. thin film
- Monocrystalline vs. polycrystalline
- 60- or 72-cell
- 25-year power production warranty for 80% performance
- Tested for 1" hail at 50 mph
- Rated in DC power capacity, typically ranging from 270-350 watts
- 10 300W modules = 3000W or 3 kW



Black on Black



Inverters

- Convert DC to AC
- String inverters vs. microinverters and hybrid inverters
- Grid-tied vs. off-grid
- Battery backup
- Automatic anti-islanding
- Generally sized to be 80% of total DC power rating of solar modules





Net Metering

- Electric loads pull from solar first
- If loads exceed solar production, additional kWh pulled from grid
- If solar exceeds loads, excess kWh sent to grid
- At end of month, you pay for net kWh pulled from grid
- Laws vary by state on caps, true-up period
- If net-exporter, either carry over kWh in IL, or get \$ credit in MO

Considerations for Installing Solar

Roof Mount

- Roof orientation & pitch
- Condition of roof
- Shading
- Structural concerns



Ground Mount

- Soil conditions
- Canopies
- Fencing



Sizing a Solar Array

- Compile historical electrical usage
- Evaluate rooftop or ground capacity
- Consider energy efficiency improvements
- 1 kW DC = 1200-1300 kWh/year
- Consider net metering implications

Example:

2,000 ft² home with natural gas heat, using 12,000 kWh/year
6 kW array produces 7,500 kWh per year

$$7,500 / 12,000 = 62.5\% \text{ offset}$$



Warranties and Protections

- 10-12 year manufacturer's product warranty on equipment
- 25-year power production warranty on modules
- StraightUp "Sunrise to Sunset" guarantee
- 10 year workmanship warranty on installation and labor



Financial Incentives

- Investment Tax Credit (30%)
- Solar Utility Rebate in MO (\$250-\$500/kW)
- Accelerated Depreciation (commercial)
- Property value increase
 - *Solar homes sold 20% faster and sold for 17% more than equivalent non-solar homes (Source: NREL)*



Net Cost of Solar in Missouri

Must be installed by June 30, 2019

6 kW Solar Array	
Installed Cost	\$18,000
\$500/kW Solar Rebate	\$3,000
Investment Tax Credit	<u>\$4,500</u>
Net Cost	\$10,500

Levelized Cost of Solar	
Annual (year 1) kWh	7,500
Lifetime (30 year) kWh	208,600
Fixed Cost/kWh	\$0.05

Four Simple Steps to Savings

1. **Initial Assessment**

- Home address
- Electric bill
- Age/condition of roof

2. **Site assessment**

- Conduct shade analysis
- Confirm interconnection point

3. **Review proposal**

- Array layout & configuration
- Energy production estimates
- Savings analysis
- Pricing with incentives

4. **Sign contract**


- Engage installer to complete structural, mechanical and electrical assessment



Municipal Solarize Program?



StraightUp
SOLAR



*When there's a huge solar energy spill,
it's just called a "nice day!"*

Thank you!

Eric Schneider

Director Business Development

Eric.Schneider@StraightUpSolar.com

Steve O'Rourke

Commercial Project Developer

Steve@StraightUpSolar.com