State of the Market & Policy Drivers
Agenda

1. State of the market
2. Basic current policy regarding solar PV
Solar Industry Data: The Solar Industry is Growing at a Record Pace, the following section outlines those trends and trajectories in the solar industry that will demonstrate the diverse and sustained growth across the country.
LET’S START WITH JOBS

When it comes to Solar as an Economic Engine, nearly 260,000 Americans work in solar - more than double the number in 2012 – and a 25% increase over 2015 (51,000 workers added) at more than 9,000 companies in every U.S. state. By 2020, that number will double to more than 420,000 workers. 2016 was the fourth consecutive year in which solar employment grew by approximately 20% or greater; at 24.5% in 2016, it exceeded each of the three previous year’s 20% growth. (The National Solar Jobs Census defines solar workers as those who spend at least 50 percent of their time on solar-related work; 90% of the 260,000 jobs spend 100% of their time on solar-related work)

This information is from the Solar Foundation’s National Solar Jobs Census http://www.thesolarfoundation.org/national/ 2016, which found that the solar industry continues to exceed growth expectations, adding workers at a rate nearly 17 times faster than the overall economy and accounting for 2% (51,000 jobs) of all new jobs created in the U.S.

The number of solar jobs increased in 44 of the 50 states in 2016, showing that solar industry growth is truly a nationwide phenomenon.

Most current data as of 5/31/2017
PRESENTERS: THIS SLIDE HAS THE SAME SLIDE NOTES AS THE PREVIOUS SLIDE. It is here in case you want to compare solar jobs to coal mining and oil and gas extraction jobs.

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NOTES: As prices have fallen, installations have gone up. U.S. Solar Market Through 2016: Key Takeaways

- **14.8 GW installed in 2016**
  - 97% growth in Photovoltaic (PV) market over 2015
  - Largest year on record, surpassing 2015; Q4 2016 largest quarter on record

- **Over 42 GW of total solar capacity now installed**
  - CAGR of 59% since 2010
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- **Solar top source of new electric generating capacity installed in 2016**
  - Represented 39% of all new electric capacity added to U.S. grid
  - First time solar ranks first; Natural Gas represented 29% and Wind 26%

- **Solar prices dropped 29% from Q4 2015 to Q4 2016**
  - Price drop is seen across all market segments, led by reduced hardware costs
  - Prices have dropped 67% since 2011
  - Utility-scale PPAs now signed for $0.03 - $0.05/kWh

- **In 2016, a new solar installation was completed every 84 seconds**
  - Now 1.3 million installations in the U.S.

Growth in Solar is led by Falling Prices:
The cost to install solar has dropped by more than 70% over the last 10 years, leading the industry to expand into new markets and deploy thousands of systems nationwide.
In addition, Solar prices dropped 3% in 2015 from 2014, and the Price drop accelerated in Q1 2016, down 12% y/y
In total, Prices have dropped over 70% since 2006, and Utility-Scale PPAs are being now signed for around $0.03 - $0.05/kWh

Moving forward, the SunShot initiative is working to decrease the soft costs of solar. (http://energy.gov/sites/prod/files/2016/09/f33/Revolutiona%CC%82%E2%82%ACNow%202016%20Report_2.pdf)

Although distributed PV technology has been available for years, falling prices over the last decade have unlocked its potential not only for the average homeowner but also for larger consumers like businesses and schools. Many installations are small enough to fit on a roof, but there is nothing tiny about distributed PV’s growth. As of the summer of 2015, there have been nearly 800,000 cumulative distributed PV installations. This represents almost 10,000 MW in capacity, which is nearly equal to the capacity of utility-scale installations. (GTM & SEIA. U.S. Solar Market Insight Report: Q2 2015. September 2015.)

The cost of solar energy system hardware (i.e., panels, inverters, etc.) has dropped significantly, but the non-hardware “soft” costs of solar—such as permitting, installation, interconnection, and maintenance fees—remain a major barrier to greater deployment nationwide and can account for up to 68% of total system costs. (GTM & SEIA. U.S. Solar Market Insight Report: Q3 2014. November 2014.)

Even though module costs have been relatively constant since 2012, distributed PV prices have continued to drop, indicating that soft costs have been the major source of price reductions for the last two years. (Barbose, G.; Darghouth, N. Tracking the Sun VIII: The Installed Price of Residential and Non-Residential Photovoltaic Systems in the United States. LBNL, 2015. http://go.usa.gov/3SRz3.)
14.5 GW of solar are expected in 2016, nearly double the 2015 total, and equal to half of the solar capacity online today. Additionally, we expect to continue to see a shift of 2016 utility-scale projects to 2017, 2018.

Solar has reached 1% of total generation, this is up from 0.1% just 5 years ago. Additionally, it is expected to hit 3.5% by 2020.

**TX:** Has 467 solar companies in state, has 1,215 MW solar installed, including 136,000 homes powered by solar: [http://www.seia.org/state-solar-policy/texas-solar](http://www.seia.org/state-solar-policy/texas-solar) For a nice handout on TX: [http://www.seia.org/sites/default/files/TX%202016Q4.pdf](http://www.seia.org/sites/default/files/TX%202016Q4.pdf)

**UPDATE ON 2017 DATA:** Nearly 2.4 Gigawatts of Solar Installed in the US During Second Quarter of 2017

The U.S. installed almost 2.4 gigawatts (GW) of solar photovoltaics in the second quarter of 2017, an increase of 8 percent year-on-year, according to a new report from GTM Research and the Solar Energy Industries Association (SEIA). Breaking the figures down, a total of 2,387 megawatts (MW) were installed in the second quarter with total installed capacity in the U.S. hitting 47.1 GW, enough to power just over nine million homes. Looking forward, the U.S. Solar Market Insight report forecast that this year would see the solar industry add 12.4 GW of new capacity, down from GTM Research's prior...
forecast of 12.6 GW. More
HOW WILL SOLAR TARIFFS AFFECT PV INSTALLATIONS IN THE U.S.?

• 30% tariff on solar cells & modules, declines to 15% over 4 years

• Projected to increase cost of PV installations by 5% to 10% over the next 5 years

• 10% of PV related jobs will be lost

“Despite this setback, PV is too powerful to be stopped. The vast majority of the U.S. population supports it, and years from now this tariff will be viewed as merely a speed bump.”

~Jeff Spies, senior director of policy for Quickmount PV

Source: “Solar Today” magazine, spring 2018 – article by Jeff Spies.
SunShot Initiative Progress and Goals

The solar industry is more than 90% of the way to achieving the SunShot Initiative’s 2020 utility-scale cost target. SunShot’s 2030 goal is to cut costs an additional 50% between 2020 and 2030.

When it comes to Solar as an Economic Engine, nearly 209,000 Americans work in solar - more than double the number in 2010 - at more than 8,000 companies in every U.S. state. By 2020, that number will double to more than 420,000 workers.

This information is from the Solar Foundation’s National Solar Jobs Census 2015, which found that the solar industry continues to exceed growth expectations, adding workers at a rate nearly 12 times faster than the overall economy and accounting for 1.2% of all jobs created in the U.S. And as of November 2015 the solar industry employed 208,859 solar workers, representing a growth rate of 20.2% since November 2014.
According to the National Renewable Energy Laboratory report on U.S. PV system cost benchmarks, from the fourth quarter of 2009 to the first quarter of 2016, the modeled costs to install solar photovoltaic (PV) systems continued to decline in the first quarter of 2016 in the U.S. residential, commercial, and utility-scale sectors. And that the continuing total cost decline of solar PV systems demonstrates the sustained economic competitiveness of solar PV for the industry across all three sectors.

(BOS = Balance of System)


NOTE: GOAL OF CUTTING SOFT COSTS, WHICH INCLUDES DESIGN, DOES NOT MEAN CUTTING FEES. IT MEANS REDUCING LEARNING CURVE SO YOU CAN MAKE A PROFIT.
In just 2016 approximately 14.8 GW of was installed. Solar installed in 2015 - 19% growth in Photovoltaic (PV) market over 2014 Compound annual growth rate of 58% since 2010.
1 GW = 1,000 megawatts; 1 GW is about enough energy to power up to 750,000 homes and is equal to about 2 coal-fired power plants.

**Housing Unit source for city-specific data below:**
https://www.census.gov/quickfacts/table/HSG010215/3651000,0952000,2507000,082000,11

(Houston housing units 2010: 893,000. It would take about 1.2 GW to power all housing in Houston.)

(Dallas housing units 2010: 517,000. One GW would power about one and half Dallas-sized cities.)

(AUSTIN: approx 325,000 homes, so this is twice the amount of power needed for all the homes in Austin)

Source: https://suburbanstats.org/

1 GW is approximately 4.6 million PV panels (based on the average panel size of 295 watts) Source: DOE. https://energy.gov/eere/articles/how-much-power-1-gigawatt
Think about that for a second: 14.8 Gigawatts of power would be equal to approximately the same amount of power produced from 30 coal fired power plants. Enough to power 8.7 million homes!

Keep in mind that a standard coal plant size produces half a GW. (For balance, it is also worth noting that a coal-fired plant can produce energy 24 hours/day, which PV cannot)
Think about that for a second: 14.8 Gigawatts of power was installed in the U.S in JUST 2016. Again, that is equal to approximately the same amount of power produced from 30 coal fired power plants and enough to power 8.7 million homes – installed in just one year.

U.S. Solar Market Insight™ is a collaboration between the Solar Energy Industries Association® (SEIA®) and GTM Research that brings high-quality, solar-specific analysis and forecasts to industry professionals in the form of quarterly and annual reports.
This report focuses on the potential for continued PV cost reductions in the residential market. From 2010 to 2017, the levelized cost of energy (LCOE) for residential PV declined .52 cents per KWh, to 15.1 cents/kWh. Two key market segments demonstrate significant opportunities for cost savings and market growth:

1. Installing PV at the time of roof replacement, and
2. Installing PV as part of the new home construction process.

NREL estimates that between 2017 and 2030, an average of 3.3 million homes per year will be built or require roof replacement. If those homes were to have solar PV installed, the potential savings in U.S. electricity consumption is 30 Gigawatts GW)!
In Q1 2016, Solar installation in the United States hit 1 million \textit{(CUMULATIVE)} solar systems installed, and this is expected to continue with as many as 2 million installs in just 2 more years.
In 2017-2018, 2 million more installations are expected. It took 100 years to get 1M and 2 years to get 2M.
A main point of this slide is that the yellow section (COM buildings) hasn’t shown as much growth as the other market segments – and that’s OUR JOB as designers.

We expect the U.S. solar industry to install 14.5 GW of capacity by the end of 2016, which is nearly double the amount installed in a record-breaking 2015. Through the end of this decade, there will be robust growth across all three market segments, eventually reaching a 20 GW annual solar market.

Because of the extension of the ITC (FEDERAL INVESTMENT TAX CREDIT – more on this in next section), the COM and RES markets will continue to grow. It’s a trend. (NOTE that utility growth is steady despite the fact that utilities do not pay taxes or take tax credit)

The cost to install solar has dropped by more than 70% over the last 10 years, leading the industry to expand into new markets and deploy thousands of systems nationwide. (Source: http://www.seia.org/research-resources/solar-industry-data)

A utility-scale solar facility is one which generates solar power and feeds it into the grid, supplying a utility with energy. More info: https://www.greentechmedia.com/articles/read/what-does-utility-
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In regards to Solar PV price breakdown: The biggest cost-decline opportunity in the solar industry exists in soft costs, including design, labor, supply chain and overhead considerations. The U.S. Department of Energy is leading the charge on reducing soft costs, and SEIA and The Solar Foundation are working with cities and counties to streamline permitting processes and reduce local barriers to going solar.

Definitions:
BOS = Balance of systems
PII = Professional Indemnity Insurance (for design professionals)
Supply chain = the sequence of processes involved in the production and distribution of a commodity.

Q2 2016 Solar Market Update: Key Takeaways
Over 4 GW installed in 1H 2016
45% growth in Photovoltaic (PV) market over 1H 2015
Q2 2016 was largest non Q4 ever
Nearly 32 GW of total solar capacity now installed
CAGR of 58% since 2010
Generates enough electricity to power 6.2 million homes
Solar prices dropped 18% from Q2 2015 to Q2 2016
Price drop is seen across all market segments
Prices have dropped 63% since 2011
Utility-Scale PPAs now signed for $0.03 - $0.05/kWh
Through Q2 2016, Solar represents 26% of all newly installed electric capacity
With big 2H 2016 expected, could end year ahead of Wind, NG
In Q1 2016, hit 1 million solar installations
Will hit 2 million installs in just 2 years
(SOURCE: http://www.seia.org/research-resources/solar-industry-data)
Residential solar has benefitted from decreasing costs, increased competition, improved consumer awareness, and most importantly an influx of new capital that has allowed companies to offer a variety of financing options.

The commercial market has success with large players like Walmart, Apple and Target, but challenges remain in providing competitive financing for smaller companies without credit ratings.
Solar insolation, or solar resource, maps are available from the National Renewable Energy Laboratory, NREL, at [http://www.nrel.gov/gis/solar.html](http://www.nrel.gov/gis/solar.html)

Solar Insolation is the amount of electromagnetic energy incident on the surface of the earth. Basically that means how much sunlight is shining down on us.
In this map, you can see the areas of the U.S. with the highest solar potential. Although it should be noted that all states in the U.S. are suitable for solar PV.
INSOLATION - THE AMOUNT OF SOLAR RADIATION REACHING A GIVEN AREA

Here's another way to demonstrate that it's not the "sun" that determines where solar will be successful – it’s the policies...
Here you can see the solar resource available in all U.S. states, and we can compare that to the solar resource available in Germany.

As a comparison, PV accounted for an estimated 7.4 percent of the country's net-electricity generation in 2016.
The US has not even come close to reaching our potential, considering Germany's annual solar resources are comparable to that of Alaska. Almost every region in the continental United States has greater average solar potential than Germany.

Info on Germany and Spain: http://www.seia.org/research-resources/solar-energy-support-germany-closer-look
Again, here you can see the top five states by percentage growth (compared to previous year) on the insolation map. Again, the states with the strongest solar markets are typically not the sunniest states. (2015 compared to 2014 rate of growth)

ANIMATION SLIDE

In order:
1- South Carolina
2- Minnesota
3- Indiana
4- Virginia
5- Michigan

(Not related to "growth" per se, but an interesting fact about NM) - ACCORDING TO the US Energy Information Administration, "In 2015, New Mexico ranked sixth in the nation in utility-scale electricity generation from solar energy" SOURCE: https://www.eia.gov/state/?sid=NM
Here you can see the top five states by absolute growth on the insolation map. Here you can see the states with the strongest solar markets are typically not the sunniest states. **They are the states with the best policies – we’ll talk about what those policies are in a moment.** The point is... if these states that aren’t even in the sunbelt can do this well, so can YOUR state. In the CA market, only 25 firms have captured this market; in NJ there are 20 firms that have. This is your opportunity to capture it in your state. Take advantage of the untapped market. Where’s your state’s wedge, who will claim it first? And YOU can capitalize on this opportunity and profit as the market expands – this is YOUR opportunity to create. Someone is going to – will it be you?

**ANIMATION SLIDE**
In order:
1- California
2- New York
3- Massachusetts
4- Maryland
5- Connecticut
Access to capital – the primary reason the residential market has grown faster than the commercial market

State and local goals that favor renewables will drive demand for solar. For example, the city of Orlando, FL is the most recent (and 40th city) to commit to 100% renewable energy. [https://www.ecowatch.com/orlando-renewable-energy-2470947578.html](https://www.ecowatch.com/orlando-renewable-energy-2470947578.html) Also - 118 Mayors have endorsed 100% renewable energy: [http://www.sierraclub.org/ready-for-100/mayors-for-clean-energy](http://www.sierraclub.org/ready-for-100/mayors-for-clean-energy)

Other examples: Denver, CO's goal "to reduce community Greenhouse Gas (GHG) emissions 80 percent below 2005 levels by the year 2050 ("80 by 50")"; Ithaca, NY has already achieved 100% by buying RECs; Georgetown, TX: 100% by 2017; Three communities in Los Angeles (Mar Vista, Venice, and Silverlake: 100% by 2018); San Jose, CA: 100% by 2022; San Francisco: 100% by 2030; Santa Barbara, CA: 100% by 2033; San Diego, CA: 100% by 2035; Burlington, VT 100% by 2050; Aspen, CO already achieved 100% (August 2015); Greensburg, KS already achieved 100%.


Workforce development - includes THIS training for design professionals.
For a state-specific job info from U.S. DOE:
Basic Policy Regarding Solar PV

CUSTOMIZE this section for each city / state

Net Metering and tariffs affect the cost structure; policies have changed over the years and fluctuates. The message is “state policy doesn’t stay the same” (this message can be the entry to the Policy section”).
This digital meter runs in both directions to accommodate electricity generated at this customer’s home. Net Energy Metering, NEM, is the most common tool that provides value to the customer via credits received up to the full retail electric rate. Credits are accrued and banked for the purposes of offsetting usage during the evenings and when the sun is not shining and have the ability to be rolled over on a month to month basis for up to a year.

It is important to keep in mind that NEM rules and rate vary by state and sometimes by utility territory. Net-metering policies to give customers financial credit for the solar power they pump into the grid are considered vital incentives for buying and installing solar panels. With some exceptions though—Texas as a whole has no traditional net-metering policies. The service territory of El Paso Electric allows net metering. Texas is one of 10 states with “F” grades on net metering. However, some municipal utilities in the state have adopted net-metering policies. A handful of individual companies have begun offering net-metering incentives, whether through electricity providers like TXU Energy or solar panel providers like SolarCity.

As for interconnection policies, Texas was chided for requirements for redundant external disconnect switches and for additional insurance that can drive up customer costs.

**TEXAS:** Has no statewide net metering law; it’s all voluntary unless a municipality has adopted a net metering policy. These four have:

1. Austin Energy, the municipal utility of Austin Texas, offers net metering to its non-residential retail electricity customers for renewable energy systems up to 20 kilowatts (kW). Austin Energy offers the Value of Solar rate instead of net metering for residential customers with solar photovoltaic (PV) systems no larger than 20 kW. The current Performance Based Incentive Rate being accepted is $0.09/kWh for a ten year term. Net Excess Generation: Customers that generate more electricity than they consume during a monthly billing period will receive a credit for net excess generation (NEG) at the appropriate avoided cost rate. [http://programs.dsireusa.org/system/program/detail/327](http://programs.dsireusa.org/system/program/detail/327)

2. San Antonio CPS Energy customers. There is no aggregate capacity limit or maximum system
size. There are also no commissioning fees or facilities charges for customers. CPS Energy offers a rebate incentive to residential and commercial customers who enroll in net metering. Net Excess Generation: At the end of each billing period, CPS Energy pays the customer-generator for net excess generation at its avoided cost rate via a credit to the monthly bill. http://programs.dsireusa.org/system/program/detail/5547

3. El Paso El Paso Electric (EPE) has offered net metering to customer-generators since September 2011. To qualify, distributed renewable generation (DRG) owners must either: interconnect an apartment house occupied by low-income elderly tenants that qualifies for master metering or have a qualifying facility with a design capacity of not more than 50 kilowatts (kW). Additionally, the DRG facility must be rated to produce an amount of electricity less than or equal to the estimated annual electricity consumption (for new apartment house or qualifying facility) or the amount of electricity the owner consumed in the year before installing the DRG facility. EPE will install, at no cost to the customer, a bi-directional meter, although interconnection charges may still apply. Net Excess Generation: At the end of each billing period, El Paso Electric pays the customer-generator for net excess generation at its avoided cost rate via a credit to the monthly bill. If the credits on an account become greater than $50, EPE sends the customer-generator a refund check for the balance. http://programs.dsireusa.org/system/program/detail/5545

4. City of Brenham. Customer generators up to 10 megawatts (MW) are eligible to participate, although customer generators with systems 20 kilowatts (kW) or less are eligible for a separate rider and expedited interconnection. The utility will install and maintain a meter capable of measuring flow of electricity in both directions. Any net excess generation (NEG) is credited on a monthly basis at the utility's avoided cost rate. The ordinance includes a standard form interconnection application and agreement as well as standard riders. Customers must provide all equipment necessary to meet applicable safety, power quality and interconnection requirements established by the National Electric Code (NEC), the National Electrical Safety Code, the Institute of Electrical and Electronics Engineers (IEEE), Underwriters Laboratories (UL), and any applicable local and state agencies.

Net-metered customers with systems greater than 20 kW must maintain general liability insurance for personal injury and property damage of at least $500,000 per occurrence and $1,000,000 aggregate; systems 20 kW or less are exempt from the insurance requirements as long as the system's inverter is UL 1741 listed and meets IEEE 1547 requirements. A disconnect switch that is easily visible and accessible to City of Brenham employees is required for all systems. The customer generator is responsible for paying related
interconnection costs (including interconnection studies, if required) and must pass a field inspection prior to generating.
http://programs.dsireusa.org/system/program/detail/4587
This type of valuation of solar mechanism is specifically divorced from the retail rate (unlike NEM which is valued based on the retail rates) and instead provides value based on the attributes of the solar generation. Specific aspects may include:

- avoidance of electricity purchases from dirtier sources of power
- avoiding infrastructure upgrades such as new distribution and transmission lines and centralized power plants
- Providing consistent source of clean energy for the lifespan of the PV system

1.24.17:
Austin Energy current VOS= 10.6 cents per kWh (retail cost of elect typ res customer 10.8 cents, but it's tiered)
This graph shows a building’s consumption and the solar system’s production throughout the year. A solar PV system is sized to meet the annual consumption, as the energy use may vary throughout the seasons. When the system produces more energy than the building consumed, the utility account will receive a credit that can be applied to another month in the year. If a system is sized correctly, the total production should not be greater than the consumption.

Without NEM, a battery system would be needed to store the excess energy during the daytime.
SRECs: these environmental commodities have the ability to be traded within markets that have predetermined values set for SRECs. The SREC commodity only represents the clean or solar part of the kWh generated from an eligible facility. These markets are typically state driven and are found to be more robust on the East Coast.

SRECs can be claimed by the system owner, which can be the building owner or a lease or power purchase agreement company. SRECs can help shorten the payback period and provide revenue after the system is paid off.

RPS = Renewable Portfolio Standard
Allows renewable energy to replace insulation, but should it?

SPEAKERS: This slide may generate some debate. Be well prepared to teach the perspective below.

Home Energy Rating System (HERS) added in to residential energy code in 2015 as alternative compliance path called Energy Rating Index.

The Energy Rating Index (ERI) path allows renewable energy to replace insulation. The energy code has historically been designed to maximize the energy efficiency of a structure. Allowing the generation of renewable energy to offset energy consumption means that homes can be code compliant even if they use more energy. While one may think “what does it matter, if the energy is coming from the sun anyway?”, it’s not that simple: (1) solar photovoltaic (PV) panels don’t last as long as wall insulation; (2) solar PV panels can be removed by future owners; (3) solar PV panels are themselves energy-intensive to produce. Overall, the code should focus on assuring energy efficiency rather than allowing PV to offset that basic minimum goal.

Adoption of the 2015 and 2018 IECC may well drive PV deployment in residential construction, but it’s worth keeping an eye out to make sure that it is not happening at the cost of basic EE.
2018 International Residential Code

Will allow renewable energy to replace insulation, but should it?

• PV panels can be removed by future owners

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2018 International Residential Code

Will allow renewable energy to replace insulation, but should it?

• PV panels can be removed by future owners
• Ceiling and wall insulation last more than 30 years and should not be compromised
• The greater the energy efficiency in building shells - the fewer PV panels are needed (Lowering the cost for adding solar!)

IN SHORT:

The addition of PV panels should not result in lower building efficiency
Local policies include cities mandating rooftop solar on new buildings. So far, the largest city in the country to mandate rooftop solar panels is San Francisco, which began requiring (https://www.greentechmedia.com/articles/read/mandatory-solar-new-roofs-california-san-francisco-wiener-developers) them on most new buildings beginning in January. The city mandates that solar panels, a “living roof,” or a combination of the two occupy between 15 and 30 percent of the surface area of a new rooftop. A “living roof” is covered with grass, trees or other vegetation.

Other California cities that have mandated solar panel installations include Culver City, San Mateo, Lancaster, Sebastopol and Santa Monica. (https://energy.gov/savings/city-sebastopol-mandatory-solar-requirement-residential-and-commercial-buildings)


Other city renewable energy goals: http://www.businessinsider.com/the-greenest-american-cities-renewable-energy-2016-8/#san-jose-california-4
Quiz & Discussion
The number of solar PV installations is expected to increase worldwide by what percentage in 2017-2018?

a) 25%
b) 50%
c) 100%
d) 200%

Correct answer b) the solar PV market growth rate in 2016 is expected to be between 25%-50%
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Question 2

The fastest growing PV markets are in the sunniest U.S. States.

a) True
b) False
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a) True  

b) False
Question 3

**Net energy metering offers what opportunity to consumers?**

a) Lower conventional energy costs from the utility

b) Ability to balance electricity consumption and production patterns

c) Solar renewable energy credits (SRECS)

d) None of the above
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