

SOLAR SECTOR UPDATE

The MAC Global Solar Energy Index (SUNIDX) is licensed as the tracking index for the Guggenheim Solar ETF* (NYSE ARCA: TAN)

Note: Index performance does not reflect transaction costs, fees or expenses of TAN

For more information, visit: www.GuggenheimInvestments.com/tan*

MAC Global Solar Energy Index (SUNIDX)



SOLAR INDEX PERFORMANCE

The MAC Solar Index, the tracking index for the Guggenheim Solar ETF (NYSE ARCA: TAN), has sold off sharply this year and is currently down -37% year-to-date. The MAC index in 2015 closed -15% lower after the -2% decline seen in 2014 and the +127% gain seen in 2013.

Solar stocks have recently seen weakness due to (1) downward pressure on solar pricing and panel oversupply caused largely by a hangover from solar install spikes seen in 1H-2016 in China and the U.S., (2) uncertainty about whether the EPA's Clean Power Plan will ultimately survive the presidential election and its court challenge, (3) uncertainty for the U.S. residential solar market amidst a shift to purchase/loans from leases and cutbacks in net metering in some states, (4) concern about the outcome of the Nov 8 U.S. presidential election and the post-election political climate for alternative energy, and (5) ongoing trade disputes that have resulted in tariffs and various market dislocations.

Recent bullish factors for solar stocks include (1) strong overall world demand for solar with the sector set to grow by at least 20% this year (see page 4 for the world solar growth outlook), (2) the strong prospects for U.S. solar in coming years after Congress in

December 2015 approved a 5-year extension of the U.S. solar investment tax credit (ITC), (3) strong demand for solar power worldwide due to the increasingly competitive price of solar versus alternatives and as countries seek to meet their carbon-reduction targets under December's Paris COP21 global climate agreement, (4) the partial recovery in oil and natural gas prices from the early-2016 lows, (5) M&A activity in the solar sector after Tesla (TSLA) offered to buy SolarCity (SCTY) and Trina Solar (TSL) received a management go-private buyout offer, and (6) low valuation levels that indicate that solar stocks are very conservatively priced.

Solar stocks are currently trading at very low valuation levels compared with the broad market. The median forward P/E of companies in the MAC Solar Index is currently 8.7, which is well below the forward P/E of 18.6 for the S&P 500 index. In addition, the median price-to-book ratio of 0.86 for the companies in the MAC Solar Index is well below the 2.87 ratio for the S&P 500 and the median price-to-sales ratio of 0.83 for the MAC Solar Index is well below the 1.95 ratio for the S&P 500.

Solar stocks are on the defensive due to falling solar pricing and overcapacity concerns

Solar stocks have recently been on the defensive mainly because of concerns about module oversupply and falling solar pricing, which has pressured the profit margins of polysilicon, cell, and module producers. So far this year, average polysilicon solar module prices have fallen by -26% to a record low of 41 cents/watt (according to PV Insights) and solar cell prices have fallen by -38% to a record low of 21 cents/watt (according to Bloomberg New Energy Finance). Polysilicon prices posted a record low of \$13.08/kg in February but have since recovered a bit and are +11% above that low at \$14.52/kg and are up +6.5% on a year-to-date basis (see pricing commentary and charts on page 8).

In a diversified solar stock index such as the MAC Solar Index, the downward pressure on solar pricing has a mixed effect. Lower solar pricing is (1) negative for polysilicon, cell, and module producers, (2) positive for utility, commercial, and residential solar developers who pay lower module input prices and should be able to boost sales with a more price-competitive product compared with alternatives, (3) moderately negative for the large vertically

integrated solar companies that manufacture modules and also install solar plants, and (4) slightly positive for yieldcos in that more solar projects should become available as solar falls to more competitive pricing levels versus alternatives such as wind and natural gas.

For the short-term, the decline in module pricing is clearly negative for solar manufacturers because of the downward pressure on margins. However, there is a benefit that emerges over time in that lower solar pricing should stimulate demand and eventually result in higher unit sales. The problem for the solar industry thus becomes cutting costs and waiting for increased demand to emerge from lower pricing.

In the bigger picture, the solar industry has no choice but for pricing to drop further so that it becomes the cheapest source of new electricity generation and easily beats its alternatives on an unsubsidized basis. There is clearly short-term pain involved with that downward pricing process but huge upside potential over the long-run as solar gets closer to becoming the cheapest source of electricity generation. In addition, once solar is cheap enough that subsidies disappear, then demand growth will be much more natural and the boom-bust days caused by the ups and downs of subsidies will be over.

Solar has already made dramatic progress in competing with alternatives such as wind and natural gas in some areas. According to Bloomberg New Energy Finance, coal plants generate electricity for about 3.4 cents per kilowatt-hour (kWh) and natural gas for 4.7 cents/kWh. However, there are a growing number of examples of solar projects that are being offered near, or even below, those coal and natural gas figures.

For example, a new record solar power purchase agreement (PPA) low was recently established when an Asian consortium that included JinkoSolar (JKS) bid 2.42 cents/kWh for a 350 MW solar plant to be built in Sweihan, Abu Dhabi. That beat the previous record low of 2.91 cents/kWh offered by Solarpack in Chile in August. Earlier this year, Enel agreed to provide electricity for only 3.5 cents/kWh on a solar PPA in Mexico totaling 1 GW. Most large solar PPA contracts are currently being bid in the area of 4-5 cents/watt.

The good news for the solar industry is that the industry has already proved over the course of its multi-decade history that it can drive down costs on a sustained basis, thus preserving profit margins even as solar pricing declines. The solar industry has driven solar costs lower through (1) technology innovation that allows manufacturers to produce higher-efficiency panels at lower costs, (2) lower manufacturing costs stemming from economies of scale and taking advantage of the manufacturing learning curve, (3) lower balance of system costs that involve lower costs for inverters, tracking systems, permitting, and installation, and (4) reduced financing costs as solar financing techniques mature and investors gain confidence about the safety of returns from solar plants with guaranteed PPA revenue.

As an example of how solar companies are reducing costs

based on technology, First Solar (FSLR) with its latest S6 module technology will be able to reduce its module cost by about -37% to 25 cents/watt from the recent company average of about 40 cents/watt, according to analysts at Cowen and Company. Meanwhile, Daqo New Energy (DQ) with its latest technology and cost reduction efforts has cut its current polysilicon cost structure by -27% yr/yr to \$9.43/kg in total cost and to \$7.42/kg in cash cost, according to figures provided by the company.

In addition to progressively cutting production costs through technology, most large solar companies are responding to the latest drop in solar prices by cutting SG&A expenses (Selling, General and Administration Expenses), reducing employee headcounts, and shutting down older and higher-cost production lines.

The sharp decline in solar pricing seen so far this year is due to several factors: (1) an overhang of module supply in 2H-2016 since demand dried up in China after the June 2016 step-down in China's FIT and since the 2016 U.S. utility solar surge is dissipating (that surge was caused by the former ITC expiration date at the end of 2016) (see page 4 for a more complete discussion of the solar growth outlook), (2) production increases and capacity expansion announcements from existing players and new entrants, particularly in China and India, (3) the reduced effect of trade tariffs in supporting solar pricing as producers implement work-arounds to move production away from high-tariff production locations, and (4) lower manufacturing costs that allow manufacturers to naturally reduce prices.

Solar pricing is likely to see continued downward pressure until inventory levels are brought down to normal levels and companies dial back on production and capacity additions to better match demand. The current downtrend in pricing is likely to cause somewhat of a shake-out among the smaller and weaker solar players that cannot cut production costs and are too small to compete. Meanwhile, some of the large solar companies have already cut back on their capacity expansion plans and are redoubling their efforts to cut costs to sustain profit margins even as pricing falls.

Florida voters show support for solar by approving a solar tax break for businesses

Florida voters on Aug 30 approved a solar tax break by the wide margin of 73% in favor, showing that public support for solar remains strong almost aside from political affiliation. Voters approved Amendment 4, which allows the Florida legislature to exempt solar installments from property tax for 20 years for businesses. Homeowners are already exempt from paying property tax on solar equipment. The measure is not a done deal, however, because the Florida legislature in 2017 needs to approve legislation to implement the measure.

Despite the good news for solar on Amendment 4, Florida continues to be a tough place for solar to flourish due to anti-solar regulation and the lack of a renewable portfolio standard (RPS) for utilities. Florida ranks only 14th in installed solar capacity among U.S. states despite having the 3rd best solar potential in

the nation, according to the Solar Energy Industries Association (SEIA).

Pro-solar advocates are currently worried about the upcoming Florida vote on November 8 on Amendment 1. Voter approval of Amendment 1 would outlaw third-party ownership of solar in Florida, which would significantly damage solar potential in Florida by not allowing leasing of solar equipment to homeowners, businesses, or government entities.

Florida is already one of the very few states in the country that makes third-party leasing effectively impossible because the solar owner/lessor would need to register as a utility. Pro-solar advocates are worried that Amendment 1 might pass because it is intentionally couched in language that makes it look to the voter as if he or she is voting in favor of solar when in fact a vote in favor of the measure would significantly damage solar potential in Florida.

The Amendment 1 measure is formally called "Rights of Electricity Consumers Regarding Solar Energy Choice," which on its face sounds like a good thing for solar, when in fact the opposite is true. The fact that anti-solar utility interests need to use a deceptive title to try to get their anti-solar measure passed shows they know they are on the wrong side of the public on solar.

Nevada PUC bows to pressure and allows net metering grandfathering

In a boost for the U.S. residential solar sector, the Nevada Public Utilities Commission (PUC) earlier this month issued a ruling that solar customers who had already-installed solar systems or had active applications before Jan 1, 2016 will be grandfathered in to the original net energy metering program (NEM) that existed prior to a recent cut in the NEM program. Customers were outraged when the Nevada PUC unilaterally cut their NEM rates and hurt the economics upon which their system purchase was based. Large solar companies were also outraged and some withdrew altogether from the Nevada solar install market in protest.

The good news for the residential solar industry is that the pressure on Nevada's PUC was so strong that it was forced to relent and grandfather in existing solar customers. That will act as a warning to public utility commissions in other states that they are likely to face some serious backlash if they try to cut NEM rates on existing solar customers.

Clean Power Plan oral arguments will be heard on Sep 27

Oral arguments on the case about whether the EPA overstepped its authority with the Clean Power Plan (CPP) are scheduled to be heard on Sep 27 by the Court of Appeals for the District of Columbia Circuit Court. Of the nine judges on that court who will hear the CPP case, five were appointed by Democratic presidents and four were appointed by Republican presidents, possibly giving the CPP the upper hand with a 5-4 decision if the case is

decided along partisan lines. Based on the current time line, a decision by the Court of Appeals for the DC Circuit could come by late 2016 or early 2017. The case would then likely be heard by the U.S. Supreme Court on appeal by spring or fall 2017.

However, the fate of the CPP also depends on the outcome of the presidential election on November 8. If Donald Trump wins the White House and takes over as President in January, then all the court challenges would likely become moot because the Trump campaign has said he would rescind the EPA's CPP.

On the other hand, if Hillary Clinton wins the White House, then the ultimate fate of the CPP would likely depend on the makeup of the U.S. Supreme Court at the time of a CPP decision. Ms. Clinton has already said that she strongly supports the CPP and would press for its implementation.

The presumption is that the U.S. Supreme Court at present is tied 4-4 on CPP since opponents to the CPP lost their 5-4 advantage on the Court when Antonin Scalia died in February 2016. If Ms. Clinton can get a new Supreme Court justice through the Senate in time for a CPP ruling and that judge supports CPP, then the chances would appear to be good for a 5-4 vote in favor of CPP.

On the other hand, if Ms. Clinton wins the White House but cannot get a new justice on to the Supreme Court bench in time for a CPP ruling, then the Supreme Court could end up deadlocked 4-4 on the CPP. In the case of a Supreme Court deadlock, the decision of the Court of Appeals of the DC Circuit would become the final ruling on the CPP case, illustrating the importance of the Court of Appeals decision.

The CPP is currently in a state of suspended animation since the U.S. Supreme Court on February 9, 2016, granted a stay for the states on complying with the EPA's CPP until the merits of the plan are litigated in court. The Supreme Court's stay means that states, if they wish, can stop the planning process on how they would comply with the CPP.

The CPP is not scheduled to come into effect in any case until 2022. Before the Supreme Court issued its stay, the states were required to submit their plans by 2018 on how they would comply with the CPP. If the EPA ultimately wins the CPP case, it not clear whether the EPA will give the states additional time to submit their plans since states that oppose CPP have stopped work on their plans. However, states that favor the plan have continued their work on adopting their plan to meet the requirements of the CPP.

The goal of the EPA's CPP is to reduce national greenhouse gas emissions by 32% from 2005 through 2030 and for the U.S. to get 28% of its electricity from renewable energy sources by 2030, more than double the 2014 level of 13%. The CPP is the centerpiece of the Obama administration's plan on how to comply with the Paris COP21 global climate agreement. If the CPP ultimately does come into effect, it would provide a big boost for solar power after the current solar Investment Tax Credit (ITC) largely expires in 2022.

SOLAR PV GROWTH OUTLOOK

Over the last five years, global PV annual solar installs have tripled to 56.0 GW in 2015 from only 18.2 GW in 2010, producing a very strong +25% compounded annual growth rate over the last five years, according to Bloomberg New Energy Finance (BNEF). Looking ahead, BNEF is forecasting solar growth at +20% (to 67 GW) in 2016, +25% in 2017, and +23% in 2018.

Solar growth rates are notoriously difficult to predict, sometimes leading to widely varying forecasts among various research groups. GTM Research, for example, is much more optimistic than BNEF about 2016 and is predicting that global solar installs in 2016 will surge by +43% to 73 GW due to the temporary growth spikes caused by the Chinese FIT step-down and the former end-2016 ITC expiration in the U.S. Since GTM is expecting such a big spike in 2016, GTM is then forecasting that growth will reset to more normal levels in 2017-18 with growth in 2017 falling by -10% to 65.7 GW.

Regardless of the near-term volatility in solar growth, the long-term demand picture for solar remains very strong since solar will account for 35% (3,439 GW) of all electricity capacity additions and a massive \$3.4 trillion of solar spending through 2040 (averaging about \$135 billion per year), according to BNEF. BNEF forecasts that solar PV will account for 15% of world electricity capacity by 2040, up from only about 1% at present.

Demand for solar should continue to surge in coming years as unsubsidized solar pricing falls farther and increasingly beats other sources of electricity generation. Solar costs have already fallen by some 50% over the past several years. Looking ahead, the International Renewable Energy Agency predicts that the average cost solar electricity cost will plunge by another -59% by 2025, making solar the cheapest form of power generation in "an increasing number of cases."

China's 1H-2016 installs surged on June FIT step-down

China is expected to install more than 20 GW of solar in 2016, which means growth in 2016 will be more than 25% from 16 GW in 2015. The 2016 install level will be well above the Chinese government's official target figure of 18.1 GW.

A race among developers to beat a June 30 step-down in China's feed-in tariff (FIT) caused a first-half install rush that was as high as 20 GW by some estimates. BNEF is predicting another 8 GW of installs in the second half of 2016 for a total annual install amount of 28 GW. In 2017, however, the Chinese government is likely to renew its solar target near the 2016 level of 18.1 GW, suggesting that solar installs in 2017 will fall back to the 18-22 GW area.

It should be noted that China is seeing problems with solar power curtailment in a few isolated areas that is hurting the overall national solar growth rate. Specifically, electricity usage

from existing solar plants is being curtailed by utilities in some northwestern provinces such as Inner Mongolia and Gansu. The curtailment is being caused mainly by electricity overcapacity due to coal plants being overbuilt in these particular areas, leading to the curtailment of solar power even though solar power in theory has a regulatory preference over coal. The Chinese government is trying to remedy the situation by halting new coal plant building in those regions and by requiring grid operators to boost their use of renewable electricity.

U.S. faces 2017 slowdown after 2016 utility solar surge

U.S. solar installs in 2016 will soar by 85% to 13.9 GW, according to GTM Research ([link](#)). In the latest figures, GTM says that the U.S. in Q2-2016 installed 2.051 GW of solar (+43% yr/yr). Solar accounted for 26% of overall U.S. electricity generation in the first half of 2016.

The surge in 2016 solar growth is mainly due to a spike in utility PV that will account for about 70% of all U.S. solar installs in 2016. Utility PV is seeing a big surge in 2016 because many solar projects were hurried into 2016 to take advantage of the Investment Tax Credit (ITC) that was previously scheduled to expire at the end of 2016. Congress in December 2015 extended the ITC by 5 years, but most of the projects that were already in planning moved ahead in 2016, thus causing the 2016 bulge. That means that utility PV will drop sharply in 2017 from the artificially high level seen in 2016.

The drop in utility PV growth to more normal levels starting in 2017 is expected to cause the overall U.S. solar growth rate to fall by about -17% in 2017 and by about -7% in 2018, according to GTM. However, GTM then expects the U.S. solar install rate to return to a strong annual growth rate averaging about +20% in the 2019-2021 period. Smoothing out the ITC effects results in an expected 6-year compounded annual growth rate of +19% from 7.5 GW of installs 2015 to 21.5 GW of installs in 2021, according to GTM.

In the U.S. residential sector, solar growth in H1-2016 slowed to +3% yr/yr from +11% in the year-earlier period (according to GTM) because the residential sector is transitioning away from a lease model to a purchase/loan model and because some states are cutting back on their net metering incentives. Non-residential (commercial & industrial) solar in Q2-2016 was up +5% q/q and +49% y/y with weakness in northeast markets offset by strength in California, according to GTM.

U.S. solar in the next five years will benefit from the federal ITC, which stays at 30% through 2019 and will then step down to 26% in 2020 and 22% in 2021. The ITC in 2022 will expire entirely for direct-owned residential, but will remain at 10% indefinitely for utility PV projects, non-residential, and third-party-owned residential. Projects only need to commence construction by the

SOLAR PV GROWTH OUTLOOK (CONTINUED)

end of the year in question to qualify for the ITC, as opposed to the previous requirement that the project had to be completed and grid-connected by year-end.

When the ITC largely expires in 2022, the solar market is hoping for a big dovetail boost from the EPA's Clean Power Plan (CPP), which is currently making its way through court challenges. The goal of the EPA's CPP is to reduce national greenhouse gas emissions by 32% from 2005 through 2030 and for the U.S. to get 28% of its electricity from renewable energy sources by 2030, more than double the 2014 level of 13%. The CPP is the centerpiece of the Obama administration's plan on how to comply with the Paris COP21 global climate agreement.

Japan is coming off its Fukushima solar boom

In Japan, solar surged after the Fukushima nuclear disaster in 2011 due to a generous government feed-in-tariff (FIT). Japan solar installs soared by +64% on an annual compounded basis in the five years through 2015. However, Japan is in the process of bringing nuclear capacity back on line and has cut its solar FIT, leading to expectations for substantially smaller Japanese solar installs over the next few years. GTM is forecasting that Japan's solar installs in 2016 will fall by -12% to 10.2 GW from the peak of 11.644 GW in 2015 and in 2017 will fall by another -14% to 8.8 GW.

India solar boom in progress

The Indian government is pushing solar very hard as part of its goal of modernizing India's infrastructure and boosting its global business competitiveness. The government has set a goal of installing a cumulative 100 GW of solar by 2022, including 40 GW of rooftop solar. The 100 GW target would be 20 times Indian's cumulative installed solar capacity of just over 5 GW at the end of 2015. India will install 5.4 GW of solar in 2016, according to Mercom Capital Group, which would represent a big 157% growth rate for 2016.

European solar remains weak on reduced FIT support

The UK is coming off a solar boom with the government cutting its FIT by 65%. GTM Research is forecasting that UK solar growth in 2016 will fall sharply by -45%. Meanwhile, solar installs in continental Europe remain weak in the wake of FIT cuts in recent years. Europe is progressively moving towards competitive auction bidding for solar and is slowly moving away from FIT support.

Rest-of-world is coming on strong

In 2016, the top five countries of China, U.S., Japan, India and UK will account for 80% of all installs. However, solar growth in coming years will diversify as a wide range of other countries ramp up installations. The geographical diversification of solar will be very helpful in reducing the boom-bust events in various developed countries that have buffeted the solar industry in recent years.

By 2020, GTM is forecasting that 26 GW of solar power growth will come from Latin America, 19 GW from the Middle East and Turkey, and 23 GW from Asia (apart from China, India, Japan and Australia).

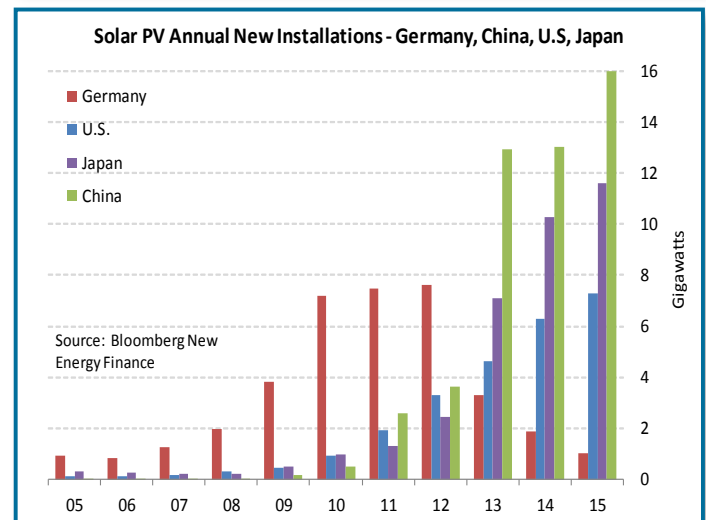
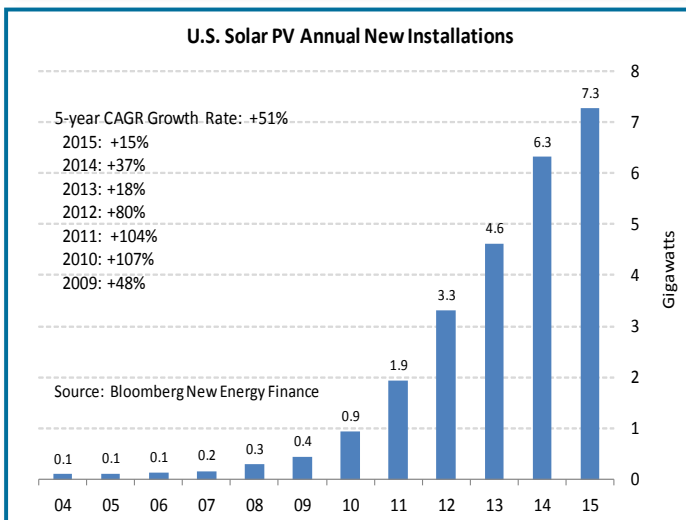
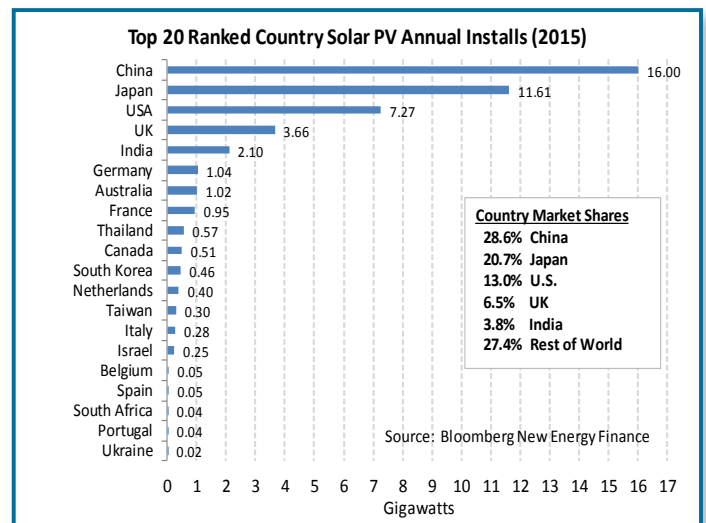
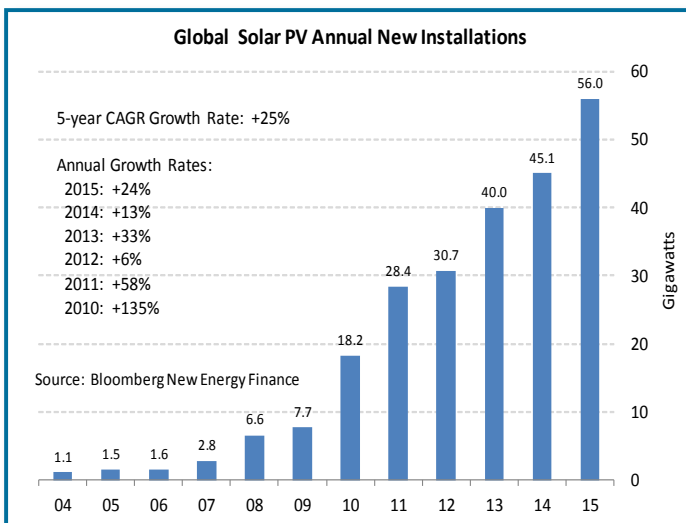
SOLAR PV ANNUAL NEW INSTALLATIONS THROUGH 2015

New global solar PV installations in 2015 grew by +24% y/y to a record 56.0 gigawatts (GW), according to Bloomberg New Energy Finance (BNEF). The 2015 growth rate of +24% followed growth rates of +13% in 2014 and +30% in 2013. Global solar PV installations have grown at a compounded annual rate of +25% over the last 5 years and have risen by eight-fold from 2008.

In 2015, China was the top country in the world for new annual PV installs for the third straight year with 16.0 GW of installs, up +23% from the 13 GW of installs seen in 2013 and 2014. Japan remained in second place for the third straight year with 11.6 GW of new installs in 2015, up by +13% from 10.2 GW in 2014. The U.S. stood third in new installs in 2015 for the third straight year at 7.3 GW, up by +15% y/y. The UK was in fourth place for the second straight year with 3.7 GW of new installs in 2015, up +69% from 2.2 GW in 2014.

The sharp increase in installs in China, Japan and the U.S. more than offset the declines in continental Europe where installs continued to be undercut by reduced subsidy support. German solar installs in 2015 fell by -46% to 1.0 GW and were far below the 2013 peak of 7.6 GW. Italian installs in 2015 fell by -34% to 280 MW, sharply below the 2011 peak of 7.9 GW. French installs in 2015 fell by -10% to 950 MW, about half the 2011 peak of 1.8 GW.

U.S. solar PV installations in 2015 grew by +15% to a record high of 7.3 GW from 6.3 GW in 2014, according to BNEF. U.S. PV installations over the last 5 years have grown by a compounded annual growth rate of +51%. U.S. The states with the largest amount of new PV solar installations in 2015 were California (-8% yr/yr to 3.3 GW), North Carolina (+186% to 1.1 GW), Nevada (-12% to 307 MW), Massachusetts (-10% to 286 MW), and New York (+64% to 241 MW), according to GTM Research.



SOLAR PV CUMULATIVE INSTALLATIONS THROUGH 2015

The amount of cumulative PV electricity generation capacity across the world grew sharply by +30% y/y to 248 GW in 2015, according to Bloomberg New Energy Finance (BNEF). In just five years, global cumulative solar PV electricity generation capacity has increased nearly six-fold from 44 GW in 2010 to 248 GW in 2015, representing a compounded annual growth rate of +42%.

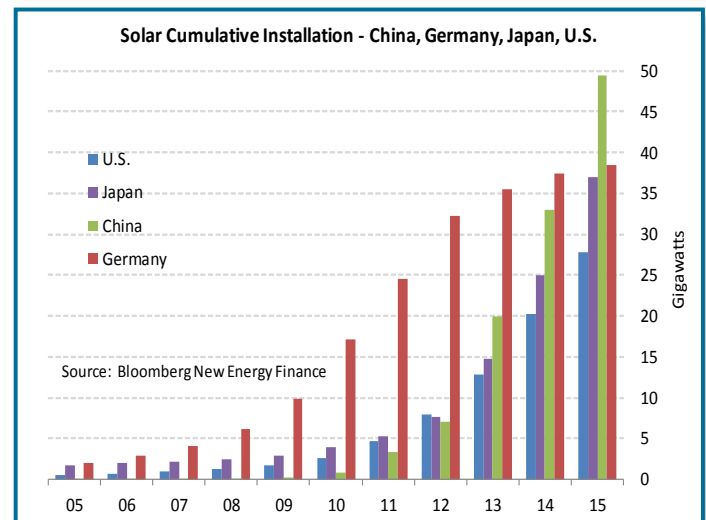
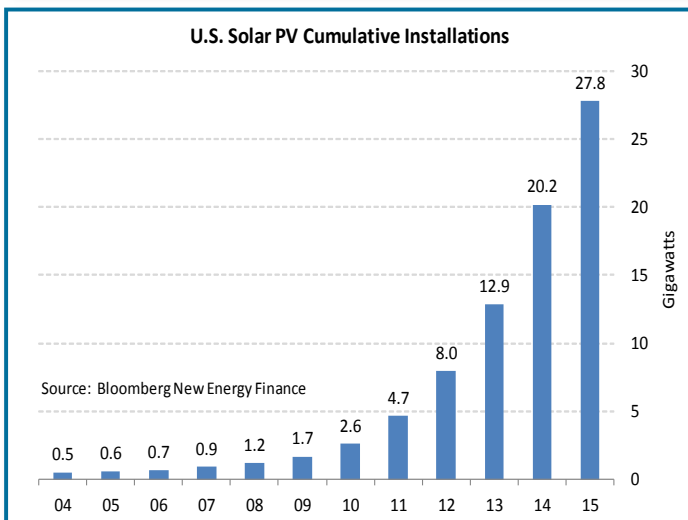
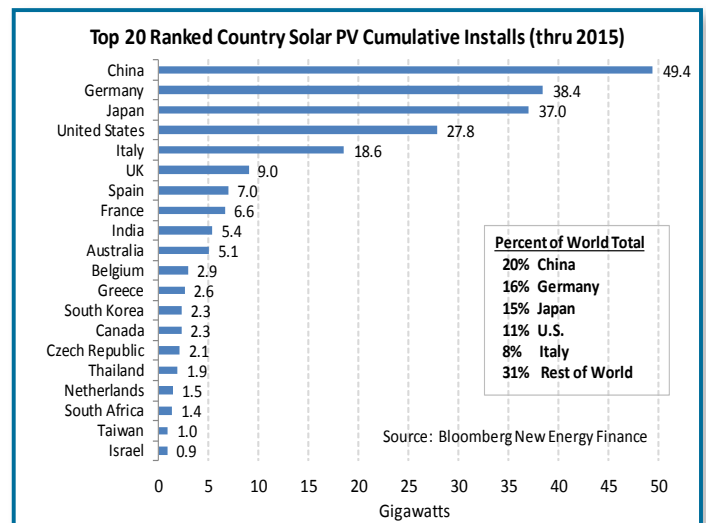
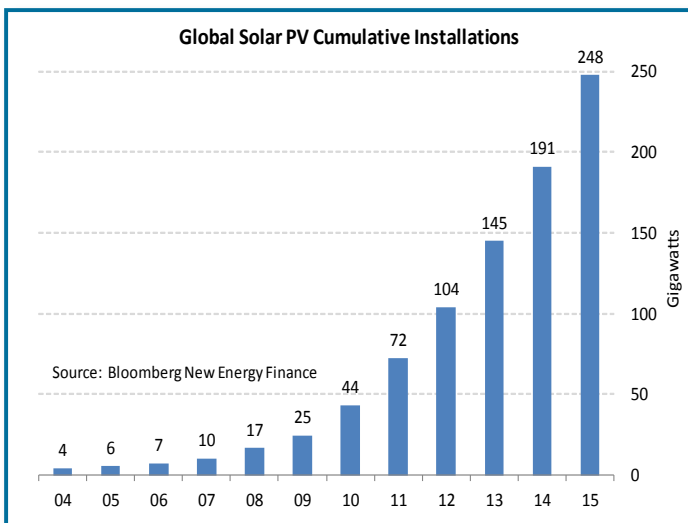
China leapt ahead of Germany in 2015 to take the top spot in the world for cumulative solar capacity at 49 GW, according to BNEF. China at the end of 2015 accounted for 20.0% of world solar PV capacity. In the past five years, China's cumulative solar capacity has soared 62-fold from only 789 MW in 2010 to the 2015 level of 49 GW, representing a 5-year compounded annual growth rate of 129%.

Germany fell into second place with 38 GW of cumulative solar PV capacity, up by only +2.8% from 2014. Germany's cumulative

solar electricity capacity in the past 5 years has more than doubled from 17.1 GW in 2010 to 38.4 GW in 2015. Germany at the end of 2015 accounted for 15.5% of the world's total solar PV capacity.

Japan remained in third place for the third straight year. Japan's cumulative solar capacity in 2015 rose by +48% to 37 GW, representing 14.9% of world capacity. Japan's cumulative solar capacity in the past 5 years has risen by nine-fold to 37.0 GW from only 3.9 GW in 2010, representing a 5-year compounded annual growth rate of 57%.

The U.S. remained in fourth place for the third straight year. U.S. solar capacity in 2015 rose by +38% to 27.8 GW, representing 11.2% of world capacity. U.S. cumulative solar electricity capacity over the past five years rose by ten-fold to 27.8 GW from 2.6 GW in 2010 and showed a compounded annual growth rate of +61%.



SOLAR PRICING

Prices for solar cells and modules have fallen sharply in the past several months and have hit record lows. Specifically, the price of multicrystalline solar cells fell to a new record low of 21 cents per watt in Sep 2016, taking out the previous low of 30 cents posted in May 2014, according to Bloomberg New Energy Finance (BNEF). Solar cell prices have fallen by -38% on a year-to-date basis and have plunged by a total of -74% in the past five years from the 81-cent level seen in mid-2011.

The average price of silicon solar modules has moved lower since late 2015 and fell to a new record low of 41 cents per watt in Sep 2016, according to PV Insights. Solar module prices have fallen by -26% on a year-to-date basis and by -67% in the past 5 years from the \$1.25 level seen in mid-2011.

Spot polysilicon prices in Sep 2016 fell to a new 5-month low of \$14.52 but were still up by +6.5% on a year-to-date basis, according to data from BNEF. Polysilicon prices in Sep were still +11% above the record low of \$13.08 per kg posted in early-

February 2016. Polysilicon prices in the past 5 years have plunged by a total of -75% from the \$51.37 level seen in mid-2011. The decline in polysilicon prices is a key factor in allowing solar cell and solar panel prices to decline since polysilicon is the key raw material for most solar cells.

The price of thin-film modules made by First Solar and others fell to a record low of 43.0 cents per watt in Sep 2016, according to BNEF. Thin-film module prices have fallen by -26% on a year-to-date basis and by -55% from the mid-2011 level of 95.5 cents.

Solar prices have fallen sharply in 2016 due to reduced demand in 2H-2016 after the 1H-2016 spike, ample supplies, and circumvented trade tariffs. There is overcapacity in the Chinese market due a sharp drop in Chinese solar installs in the 2H-2016 after the spike in 1H-2016 to beat the June 2016 FIT step-down. Solar prices typically decline slowly over time due to improved technology, scale manufacturing, and lower production costs.

