

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), posted a 1-1/3 year high in April but then fell sharply in the last three months and is currently down -7.1% year-to-date. The MAC solar index in 2014 fell by -2% after soaring by +127% in 2013.

Solar stocks fell in the past three months due to (1) the sharp downward correction in the Chinese stock market, which caused some carry-over weakness in Chinese-headquartered solar stocks, (2) concern that slower economic growth in China may translate into reduced solar power growth in China, (3) increased talk about a Fed rate hike in 2015 as higher interest rates could cause some downward pressure on yieldcos, (4) renewed weakness in crude oil prices after world powers reached a nuclear agreement with Iran that could pave the way for a sharp increase in Iranian oil exports late this year when sanctions are due to be dropped, and (5) continued solar trade disputes.

Despite these negative factors, the global solar industry as a whole remains healthy with strong demand and improving margins. GTM Research is forecasting that annual solar installations in 2015 will grow by +36% y/y, the strongest growth rate in three years.

Meanwhile, solar installs in China in Q1-2015 were very strong at 5 GW, double the previous year and higher than expectations of 2-3 GW. China should be able to easily hit its 2015 annual target of 17.8 GW, which would be up by 37% from 2014's install amount of 13.0 GW. U.S. solar in 2015 will grow by +29%, according to GTM Research.

Solar will see a massive \$3.7 trillion of investment through 2040

Solar will boom over the next 25 years and will account for 35% (3.429 GW) of all electricity capacity additions through 2040, according to Bloomberg New Energy Finance's "[New Energy Outlook 2015](#)." Spending on new solar installs will be a massive \$3.7 trillion through 2040, according to the BNEF report.

Meanwhile, all-in project costs for solar will plunge by 48% by 2040 due to steep experience curves and improving financing, according to the report. BNEF believes that solar will reach retail-price parity in all major economies by 2040 and that utility-scale PV will be the least-cost power generation option for utilities without subsidies by 2030.

BNEF sees a renewable revolution over the next several decades with zero-emission energy sources accounting for 56% of the world's power-generating capacity mix by 2040, causing fossil fuels to drop to 40% from the current two-thirds. BNEF says the developing world will account for the largest proportion of solar installs since the developing world will build three times as much new electricity generation capacity as the developed world. That highlights the fact that the bulk of new solar installs will move to the developing world in coming years from the current concentration in the developed world.

U.S. Clean Power Plan (CPP) sets stage for long-term solar growth

The Obama administration on August 3 announced finalized rules for the EPA's Clean Power Plan (CPP), which envisions a 32% reduction in national greenhouse gas emissions from 2005 through 2030. The plan is part of the Obama administration's goal for the U.S. to get 28% of its power from renewable energy sources by 2030, more than double last year's 13%. In announcing the plan,

President Obama said “We only get one home. We only get one planet. There is no Plan B.”

The CPP plan targets carbon reductions in the electricity-generation sector, which accounts for about one-third of all U.S. carbon emissions. The plan expresses explicit support for renewables and nuclear but comes down hard on coal in particular and has less reliance on natural gas than the preliminary plan. Coal produces about 80% of the U.S. power sector’s carbon emissions, making it a prime target as a means to reduce emissions. The U.S. Energy Information Administration says that nearly 400 GW of renewable energy will be possible by 2040 under CPP, giving the solar and wind industries a big opportunity.

Despite the long-term opportunity, the plan will take time to have an impact since (1) there will be legal challenges to the plan as well as compliance resistance by some states, (2) states under the CPP plan do not need to have their carbon-reduction plans in place until 2018 and have until 2022 to meet their first carbon reduction targets, and (3) a future president and/or veto-proof Congress could halt the plan altogether. Hillary Clinton expressed support for CPP but all the Republican presidential candidates have said they oppose the plan.

The EPA has launched the CPP plan under the regulatory authority that the U.S. Supreme Court approved for the EPA to regulate carbon emissions under the Clean Air Act in the case of Massachusetts vs. EPA in 2007. The fact that the Supreme Court has already approved the EPA’s authority to regulate carbon emissions means that legal challenges to CPP may have an uphill battle.

The Obama administration is relying heavily on the CPP plan to demonstrate its world leadership on climate issues. President Obama in September will meet with Pope Francis on his trip to the U.S. The Pope has already boldly called for government action to address the problem of climate change. The U.S. also wants to show leadership ahead of this December’s climate talks in Paris, where a new global climate agreement could be reached.

Two yieldcos launch IPOs

First Solar (FSLR) and SunPower (SPWR) in June launched a \$420 million IPO for their joint yieldco named “8point3 Energy Partners” (CAFD). The company is named for the number of minutes it takes for light to reach earth from the sun. 8Point3’s current market cap is about \$1.0 billion. Separately, TerraForm Global (GLBL) in late-July raised \$675 million in its IPO and currently carries a market cap of \$4.1 billion. TerraForm Global is the yieldco that will have first rights on SunEdison’s global renewable energy projects. Several other large solar companies intend to launch yieldcos over the next year.

MAC Solar Index already has two yieldcos as index constituents: TerraForm Power (TERP) with a market cap of \$3.7 billion and Abengoa Yield (ABY) with a market cap of \$2.3 billion. Both of those stocks trade on the Nasdaq Exchange. These yieldcos provide an attractive dividend component to the MAC Solar Index.

In a “yieldco,” a solar company spins off a independent company that owns and operates large-scale solar plants under long-term power purchase agreements, usually with investment-grade utilities or corporations. Yieldcos pay an attractive and predictable dividend flow to investors. A yieldco typically has a low cost of capital to finance solar projects and pays little or no taxes due to large project depreciation costs. Meanwhile, the yieldco model allows the parent company to free up its balance sheet to focus on manufacturing, services, installation, and project development, but the parent still receives long-term cash flow from the solar projects through its partial ownership of the publicly-traded yieldco.

Renewable energy MLP bill re-introduced in Congress

A bill that would allow for renewable energy companies to utilize the Master Limited Partnership (MLP) structure was re-introduced in Congress in June. MLPs have traditionally been used in the gas and oil industry for infrastructure assets such as pipelines. The renewable energy MLP bill was introduced in last year’s Congress but there was no progress last year towards approval by the full Congress. Bloomberg estimates that extending MLPs to renewables would cost taxpayers about \$1.3 billion in tax breaks over 10 years. The problem in Congress is to decide how to “pay for” that cost. Still, there is a chance that the renewable energy MLP cost could be wrapped up in larger energy or infrastructure legislation.

Having access to MLP and REIT structures would provide another project financing avenue for the solar industry. However, the solar industry has already made the MLP avenue moot to some extent by using the yieldco structure, which has been referred to as a synthetic MLP since it has many of the same benefits as a MLP. Bloomberg estimates that \$16 billion has been raised by oil and gas companies in MLP public offerings since 2010, while about \$3 billion has been raised by North American yieldco offerings over the same period.

Solar ITC extension doesn’t make it into Senate Finance Committee’s tax extenders bill

The Senate Finance Committee on July 21 approved a tax extenders bill that included a number of extensions of renewable energy production tax credits through the end of 2016. However, the bill did not include any extension of the solar Investment tax credit (ITC) or a proposed amendment that would have the current ITC apply to projects that start before the end of 2016 versus the current situation of projects that are completed before the end of 2016. The fact that the solar ITC did not make it into the tax extenders bill was not surprising considering that the bill dealt mainly with tax credits that already expired or that expire in 2015. Congress has not yet turned its attention to tax credits that expire in 2016.

The good news is that there was fairly strong Republican support in the extenders bill for extending renewable energy credits for wind, geothermal, biomass, landfill gas, incremental hydroelectric,

and ocean energy, suggesting that the Republican Congress next year may yet be convinced to extend the solar ITC. The Senate Finance Committee, which is run by the Republicans, approved the tax extenders bill by the wide margin of 23 to 3.

Moreover, the American public continues to express strong support for renewable energy. In fact, 75% of Americans favor extending federal tax incentives that promote renewable energy, according to a poll by Zogby Analytics released in April. The breakdown in that poll showed that renewable energy tax incentives are supported by 82% of Democrats, 67% of Republicans, and 72% of independents.

The solar 30% ITC expires for residential and utility projects and falls to 10% from 30% for commercial projects at the end of 2016. There is no doubt that solar growth in the U.S. will see a serious dent starting in 2017 if the 30% ITC isn't extended. However, that would only be a bump in the road for the global solar industry as a whole since the U.S. accounted for only 14% of world solar installs in 2014. Even if the U.S. solar industry temporarily stumbles in 2017-18, the rest of the world will still be going full speed ahead with solar and U.S. solar will recover to a slower non-ITC growth rate.

Community solar is expected to be high-growth segment in coming years

The U.S. rooftop solar segment has been growing very quickly over the past few years, but 49% of U.S. households and 48% of businesses are unable to host solar PV panels, according to the National Renewable Energy Laboratory (NREL). One of the solutions to that problem is "community solar" or "shared renewables" in which customers share the electricity produced by a large solar PV array. There are a variety of possible ownership structures, but the most popular community solar projects currently involve utilities and third-party solar companies as owners and developers.

The U.S. community solar segment is still in its infancy but there are already 50 community solar programs that are planned or operating, according to the Solar Electric Power Association.

The U.S. community solar market will show a compound annual growth rate of 59% from 2014 through 2020, topping 500 MW by 2020, according to a new report by GTM Research entitled "[U.S. Community Solar Outlook 2015-2020](#)." The report says that community solar over the next five years will add 1.8 GW of solar, meaning it will become a key segment of the U.S. solar market. The report identifies four states that will account for the majority of the community solar market over the next two years because of their supportive regulatory structures: California, Colorado, Massachusetts, and Minnesota.

Meanwhile, the U.S. National Renewable Energy Laboratory (NREL) recently released a major report on community solar, laying out forecasts, policy prescriptions, and analysis of ownership structures. The report is entitled, "[Shared Solar: Current Landscape, Market Potential, and the Impact of Federal Securities Regulation](#)."

NREL is highly bullish on community solar, saying that "shared solar" could add 5.5-11 GW to the U.S. rooftop market by 2020, representing \$8.2-\$16.3 billion of solar sales. NREL says that community solar could account for 32-49% of the U.S. distributed solar PV market by 2020.

There are already some 29 developers in the U.S. that are working on community solar projects. In one example, SolarCity recently announced a program in which customers of Minnesota-based Excel Energy will be able to save about 11.5% on their electricity bill by participating in "community solar gardens." Participants can include home owners, apartment dwellers, businesses, schools, and municipal facilities. SolarCity plans to invest some \$200 million in up to 100 solar power plants, each with up to 1 MW of generation capacity.

Shared solar is a way for established utilities to break into distributed solar and compete with third-party solar developers such as SolarCity. For example, Tucson Electric Power has a project in progress where it will build and own a 3.5 MW solar plant and provide the electricity to 600 customers. The list of interested customers is heavily oversubscribed. The future looks very bright for utility-owned community solar projects as state regulatory structures become more supportive.

SOLAR PRICING

Prices for solar cells and modules since mid-2014 have been moving sideways to mildly lower. Specifically, the price of multicrystalline solar cells fell from 37 cents per watt in mid-2014 to a new record low of 30 cents per watt in May, increasing slightly to 31 cents in July, according to Bloomberg New Energy Finance. Solar cell prices in the past four years have plunged by a net -62% from the 81-cent level seen in mid-2011.

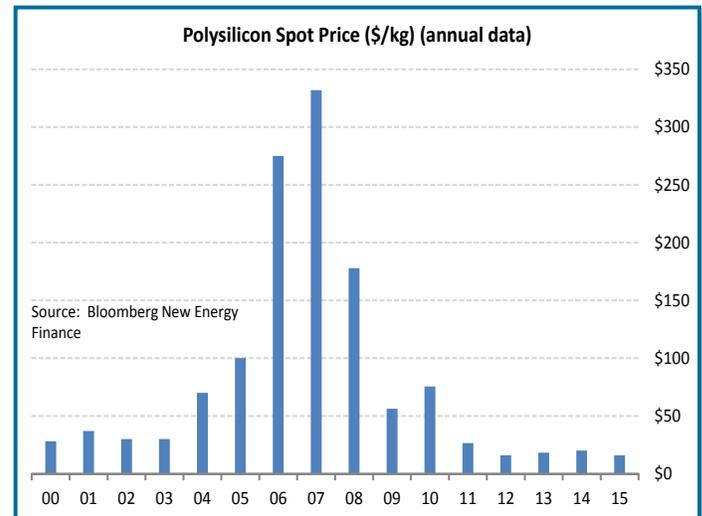
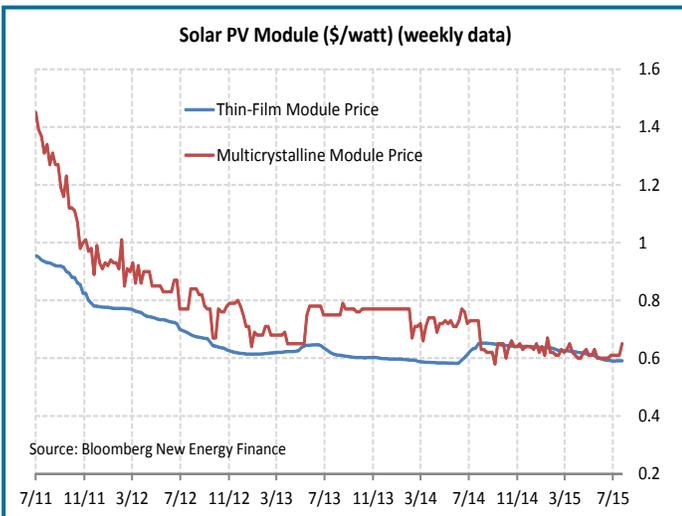
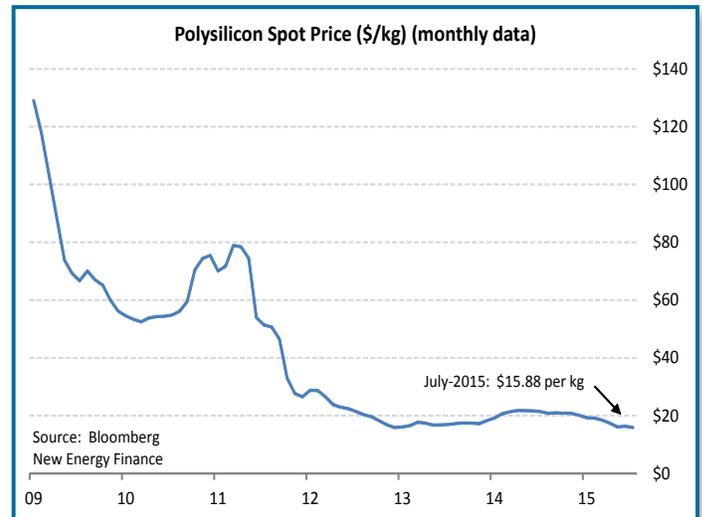
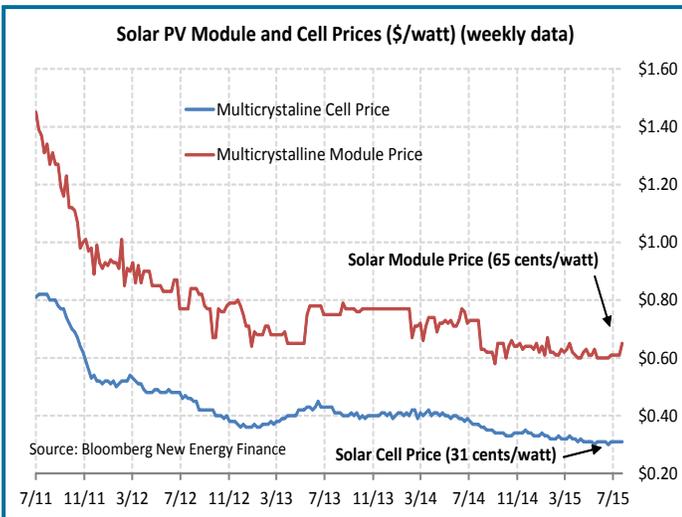
Meanwhile, multicrystalline solar module prices posted a new record low of 58 cents per watt in September 2014 but then increased a bit and were at 65 cents per watt in July 2015, according to data from Bloomberg New Energy Finance. Solar module prices in the past four years have plunged by a net -55% from the \$1.45 level seen in mid-2011.

Spot polysilicon prices traded slightly above \$20 per kilogram during most of 2014 but then eased in early 2015 and fell to a record low of \$15.74 per kg in mid-July, increasing slightly to

\$15.88 by the end of July, according to data from Bloomberg New Energy Finance. Polysilicon prices in the past four years have plunged by a net -69% from the \$51.37 level seen in mid-2011. The decline in polysilicon prices is key factor in allowing solar cell and solar panel prices to decline.

The price of thin-film modules made by First Solar and others posted a new record low of 58.2 cents in early June 2014, according to Bloomberg New Energy Finance. Thin-film module prices have since increased modestly by +2% to the current level of 59.1 cents per watt.

Solar pricing in 2013-14 stabilized mainly because of stronger demand and reduced production capacity after the 2011-12 shakeout forced smaller and higher-cost producers out of the market. In addition, the large players are now calibrating their production more closely to demand. Various trade spats have also provided some support for solar module prices.



SOLAR PV ANNUAL NEW INSTALLATIONS

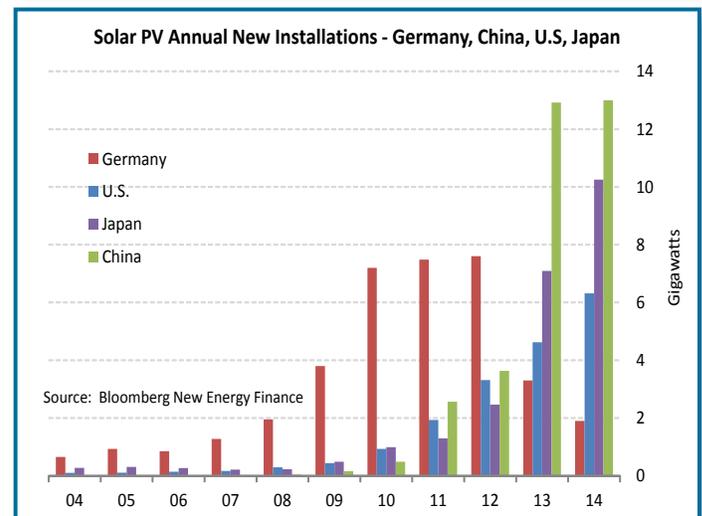
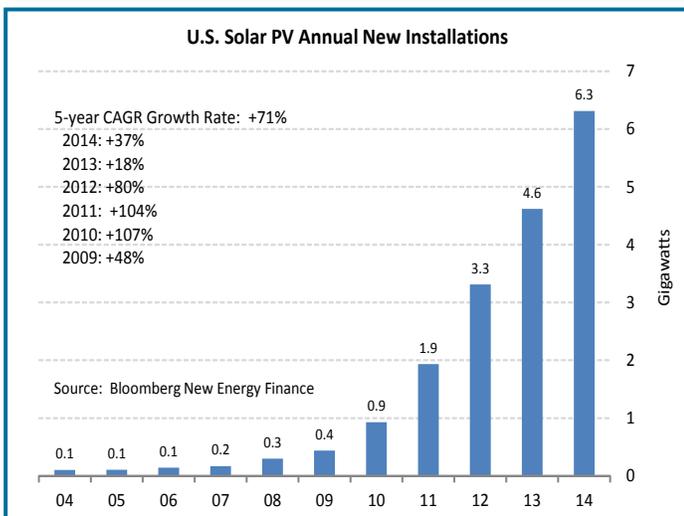
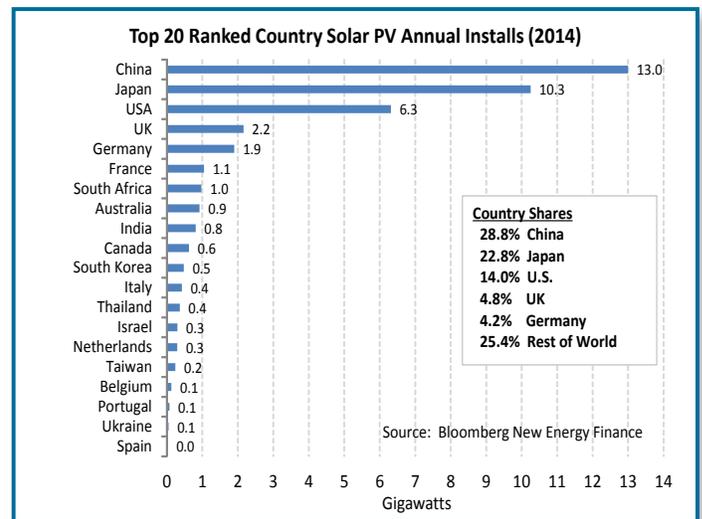
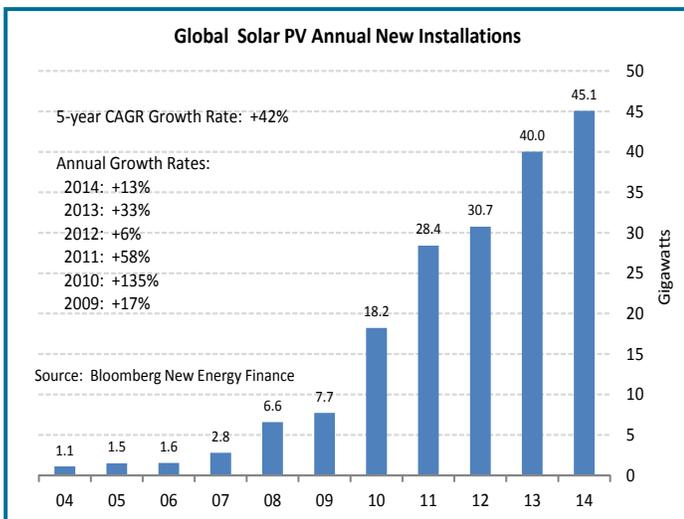
Global new solar PV installations in 2014 grew by +13% y/y to a record 45.1 gigawatts (GW), according to Bloomberg New Energy Finance. The 2014 growth rate of +13% followed growth rates of +30% in 2013 and +8% in 2012. Global solar PV installations have grown at a compounded annual rate of +42% over the last 5 years and have risen by six-fold from 2008.

China in 2014 remained in the number one world spot for annual PV installs for the second straight year with 13.0 GW of installs in 2014, up by +1% from its 2013 level of 12.9 GW. Japan remained in second place for the second straight year with 10.5 GW of new installs in 2014, up by +45% from 7.1 GW in 2013. The U.S. stood third in new installs for the second straight year at 6.3 GW, up by +37% y/y. The UK moved into fourth place for new installs in 2014.

The sharp increase in installs in China, Japan and the U.S. more than offset the declines in Europe, which were caused by reduced subsidy support. German installs in 2014 fell by -43% to 1.9 GW,

adding to the -57% decline seen in 2013 from the peak of 7.6 GW seen in 2012. Italian installs in 2014 fell by -69% to 424 MW, adding to the overall plunge of -95% seen in 2012-13 from the peak of 7.9 GW posted in 2011. French installs in 2014 rose by +62% to 1.0 GW, but that was still below the peak of 1.8 GW posted in 2011. UK installs in 2014 rose by +99% to a record 2.2 GW, adding to the +37% growth rate seen in 2013.

U.S. solar PV installations in 2014 grew by +37% to a record high of 6.3 GW from 4.6 GW in 2013, according to Bloomberg New Energy Finance. U.S. PV installations over the last 5 years have grown by a compounded annual growth rate of +71%. GTM Research is forecasting that U.S. PV installs will grow by +29% in 2015 to 8.1 GW. The states with the largest amount of new PV solar installations in 2014 were California (+35% to 3,549 GW), North Carolina (+19% to 397 MW), Nevada (+621% to 339 MW), Massachusetts (+28% to 308 MW), Arizona (-41% to 247 MW), New Jersey (+2% to 240 MW), according to the GTM Research.



SOLAR PV CUMULATIVE INSTALLATIONS

The amount of cumulative PV electricity generation capacity across the world grew sharply by +32% y/y to 191.2 gigawatts (GW) by the end of 2014, according to Bloomberg New Energy Finance. In just five years, global cumulative solar PV electricity generation capacity has increased by nearly eight-fold from 24.8 GW in 2009 to 191.2 GW in 2014, representing a compounded annual growth rate of +34%.

Despite the sharp drop in new installs in the past two years, Germany at the end of 2014 still had the world's largest amount of cumulative installed solar electricity generation capacity at 37.4 GW, according to Bloomberg New Energy Finance. Germany's cumulative solar electricity capacity in the past 5 years has risen by four-fold from 9.9 GW in 2009 to 37.4 GW in 2014.

China remained in second place in 2014 with 32.9 GW of installed PV, representing 17.2% of installed global PV capacity. China's

cumulative solar electricity capacity in the past 5 years has risen by 110-fold from 300 MW in 2009 to 32.9 GW in 2014. China in 2015 will easily move ahead of Germany into first place for cumulative solar PV capacity.

Japan moved into third place in 2014 from fourth place in 2013. Japan's cumulative solar capacity in 2014 rose by +69% to 25.0 GW, representing 13.1% of world capacity. Italy fell to fifth place in 2014 from third place in 2013 with cumulative capacity in 2014 of 18.3 GW, representing 9.6% of world capacity.

The U.S. moved up to fourth place in 2014 in world PV cumulative capacity from fifth place in 2013. U.S. solar capacity in 2014 rose by 57% to 20.2 GW, representing 10.6% of world capacity. U.S. cumulative solar electricity capacity over the past five years rose by 12-fold from 1.7 GW in 2009 to 20.2 GW in 2014 and showed an annual compounded growth rate of +51%.

