

Solar array on a building in the AT&T Park in San Francisco, which is a baseball park and home to the SF Giants. The project was initiated by Pacific Gas & Electric in 2007.

Photos (2): Go SolarCalifornia

Solar power goes mainstream

In his attitude towards renewables California's new Governor Jerry Brown is vastly surpassing his predecessor. While former Governor Schwarzenegger has devised a legacy that strongly focuses on large scale central power stations, Brown's approach is oriented towards a more decentralized green electricity generation.

California's Governor Jerry Brown, before entering office this January, made a pledge. The Governor who already lead California 34 years ago as one of the youngest governors in history is known for his green agenda, after he signed the first ever solar incentive program in 1977. Now in his early 70s and holding the record for being the oldest serving governor, Brown continues his mission by committing to produce 20,000 MW of renewable electricity in the state of California by 2020: 12,000 MW of localized electricity generation and 8,000 MW of large scale (>20 MW) renewable power systems.

The 20 GW capacity of renewable electricity generation should, according to his pledge, include solar power installation up to 2 MW in size on public and private warehouse roofs, parking lots and schools throughout the state, and up to 20 MW in size on public and private property, even on strips of land along the highways. At the same time Brown wants the legislator or the California Public Utilities Commission to implement a system similar to the feed-in-tariff for

distributed generation projects, without spiking the electricity prices for rate payers. He wants to fast-track permitting for large scale renewable projects to cut down the time from typically six to eight years to no longer than three years. Overlapping review processes in various agencies, says Brown, are the reasons for large delays. The Governor wants to "ensure that all agencies work together – with a sense of urgency – to permit projects and transmission lines without delay."

Hopes for more ambitious portfolio standards

Another goal on Governor Brown's list was to write the Renewable Portfolio Standard (RPS) of 33 % into law, mandating all California utility companies to build an energy portfolio with 33 % renewables by 2020. He just accomplished his goal on April 12 when signing the long discussed Senate Bill 14. The bill had already passed the California legislation in September 2010,



Sun Water Power 2 farm at Far Niente Winery near Oakville, California: in total the winery mounted more than 900 floating solar panels. A smaller amount of PV modules was installed on the ground.

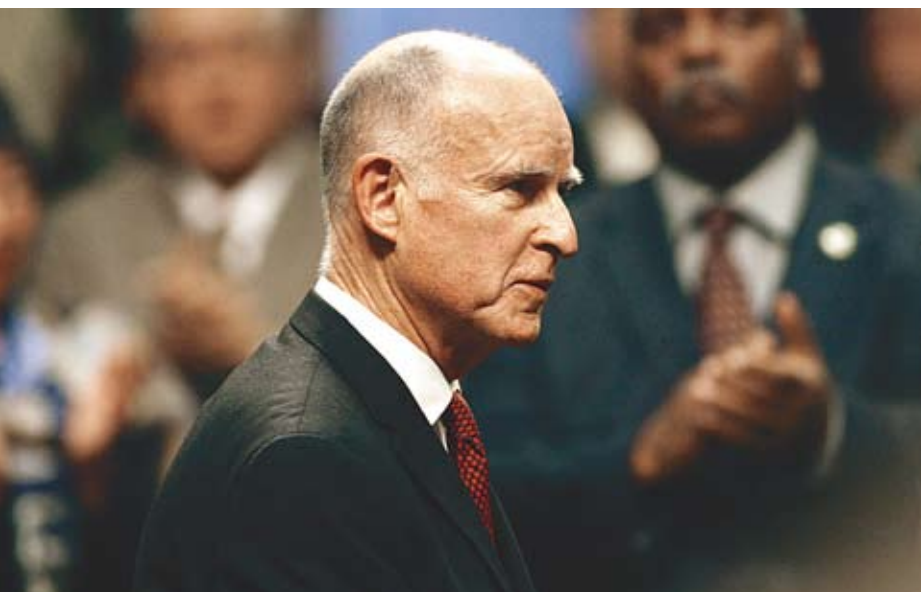
but was vetoed by the previous Governor Schwarzenegger, and instead signed as an Executive Order with less force of law than a bill. Senate Bill 14 now includes content, which had been cut in Schwarzenegger's Executive Order, such as clear language on environmental impact studies necessary for large scale power plants. An import limit for renewables was discussed in earlier stages of the bill, but did not make it to the final version, according to Laura Winsland from the Union of Concerned Scientists. With the higher RPS of 33 % California is now the state with the most aggressive alternative energy mandate in the US, Jerry Brown said at the signing at the Flextronics plant in Milpitas, which had just started PV panel production in March, "It's California leading the country, America potentially leading the world."

Utilities, which do not meet the 33 % RPS, have to pay a penalty of US\$ 0.05/kWh not produced within the mandated time frame. Previously, stakeholders had criticized the low penalty, being much cheaper than the costs to install which does not seem to be effective. So far, no utility company has been levied yet.

As of the beginning of this year the three big California utility companies (PG&E, SCE and SDG&E) say they had been on track with the 20 % schedule, reaching between 14 and 19 % of the energy production from renewable resources. Per the most current energy statistics available by the Energy Information Administration, the state of California in 2008 reached 24.9 % of its energy production with renewables, which includes hydro power (15.8 %), and gives the biggest renewable share to wind (3.7 %), and geothermal (3.0 %). Solar comes in as number 5 with 0.06 %. Nevertheless, in the 2015 forecast the California Public Utilities Commission (CPUC) expects the solar power to grow the biggest share from less than 5 % to 30 % of all renewables, even bigger than wind power, currently a little above 30 %.

Higher failure rates of large projects

With the pledge for 12,000 MW of localized energy "the Governor's office is strongly messaging to support distributed power," says Ted Ko, Associate Executive Director at the Clean Coalition, an interest group formerly known as the FIT coalition with the goal to promote distributed generation of energy without depending on the expansion of the transmission grid. Ko hopes for a paradigm change now that Governor Brown has taken office, in regard how to accomplish higher renewable standards. While Governor Schwarzenegger, a strong proponent of green energy, signed the famous California Solar Initiative (CSI) and the Million Solar Roofs program, he "was not as strong on the economic benefit," says Ko. Despite that the prices have come down a lot since the CSI



Governor Jerry Brown returned to office after a first and second term (1975 to 1983) to continue his mission to make California an even stronger leader in renewable energy.

Photo: dpa



Strong proponent of renewable energy with an affinity to larger projects: former Governor Schwarzenegger speaking on the rooftop of the Staples Center sports complex in Los Angeles in 2008.

Photo: Andrew Gompert/dpa

was signed, “there is still this old thinking, renewables cost too much.” As a consequence, we now see Schwarzenegger’s legacy as a strong focus on large scale central power stations, to reach the green energy goals in big junks.

Ted Ko says he often hears from the power companies that they already contracted enough large scale power, and don’t need to contract more, making it hard for medium size and residential projects to get contracts and ignoring the “high failure rates” of large scale central stations in the permitting phase. Ko says, “an RPS should be treated like a stock portfolio with a risk profile,” so the rate payer would understand where his utility company invests and under what risk.

Another way to help solar power reach new territories is the current update of Senate Bill 32, which addresses easy grid access for any renewable generator and a payout mechanism like a FIT on fair market rate including saved costs and benefits. It also targets to expand the size limit of a system from 2 MW to 3 MW. Kenneth White from the Clean Coalition writes in a reply to the CPUC regarding the bill, “With the contract and pricing certainty of a FIT program such as Senate Bill 32, coupled with rates reflecting the locational, environmental, and long-term avoided cost values of wholesale distributed generation, the commission can provide the necessary market certainty to finally unleash this market.”

If Senate Bill 32 comes through, says Ted Ko, potential PV generators like farmers who want to change the use of their farmland or communities as well as private investors using brown fields can quickly be turned into use – without having to go through the current RPS permitting procedure, which involves many agencies and a high amount of paper work. The bill will provide an easier, streamlined permitting route and a fixed rate over 20 years. In parallel, the utilities can expand their resources with a bigger variety of generators in peak hours, especially since they have to fulfill the 33 % renewables portion.

The two main incentive programs running in California on the residential level are the California Solar Initiative (1,940 MW) coupled with the Million Solar Roofs Program (3,000 MW), and the New Solar Homes Partnership Program in Investor Owned Utilities territory (700 MW). There is also a rebate program for a variety of non-commercial roof installations (360 MW) – residential, low income, governmental, non-profit – in the Public Utilities territory. The CSI was signed in 2006 with a US\$ 2.167 billion budget to be completed within 10 years. Now in the fourth year a large portion of the budget is spent and 827 MW (47 %) of solar power has been installed; close to 400 MW of solar power are pending decision, according to the Go Solar California website, which overlooks the progress of the program.

Results of the California Solar Initiative

In fact the program became so successful that residential installers in the Southern California Edison (SCE) area by the end of last year had to wait over a month to get connected to the grid, something that usually takes 10 days, only because SCE was simply overwhelmed. Pacific Gas & Electric (PG&E), SCE and the California Center for Sustainable Energy (CCSE) are the chosen contractors of the CSI program, each fulfilling an assigned share. PG&E and SCE, serving the most customers, each have a share of more than 40 %, and the CCSE, a non-profit company implementing the program in behalf of the San Diego Gas & Electric Company (SDG&E), accounts for about 10 % of the total budget.

Ben Airth, Residential Solar Program Manager at CCSE, says the program has experienced such high demand that what was planned as a 9-step rate schedule, to be completed in 2014 to 2015, has already sped through step 1 to 8 in the fourth year. Airth’s group has projected to reach the cap for the

CCSE area already in 2012. PV contractors and private residents can apply for installations, which currently receive an incentive of US\$ 0.35/kWh based on kWh produced. The other utilities are on a similar track, making it very likely that the program will reach its goal 2 to 3 years ahead of schedule. Airth does not see any slowdown, even though step 9 – with the incentive going down to US\$ 0.20/kWh – is approaching soon. Streamlining the permitting process and dropping prices on solar systems will help to reach grid parity. “The goal is to get levelized costs down to grid parity,” so that the customer’s electric bill over time is the same cost as a PV system. Levelized costs meaning the net cost to install an energy system divided by its expected life-time energy output.

Excess electricity paid out

It is a novelty that in 2011 residential electricity generators will be paid out at the end of the year for the excess electricity they feed in to the grid. Up until now, the utilities did not have to compensate for that. Just two years ago Ben Airth gave advice not to over-size a system, because the expected net metering tariff was only a fraction of what the rate payer pays: “The idea was to allow homeowners to maximize their well-exposed roof space so we all can have more energy generated from solar and less from power plants. But now the motivation to put power back into the grid is gone.” The average rate is still less than US\$ 0.10/kWh submitted to the grid.

PG&E published rates up for discussion in the framework of a contract with a feed-in tariff between US\$ 0.088/kWh (10-year contract) and US\$ 0.10/kWh (20-year contract) as the nominal amount, which will be multiplied by a time-of-day factor, like off and on peak. The factor for so-called super peak hours, 11 am to 7 pm from June to September, can be as high as 2.2, making up a rate of US\$ 0.19/kWh, states the draft version.

When it comes to solar installers, the state gets high compliments. “California created a blue print for other states to show how it should be done – by encouraging early adapters with high incentives,” says Sanjay Ranchod, Director of Government Affairs, at SolarCity. 50 % of the company’s installations were supported through the CSI program,

making SolarCity the largest installer within the program. “This is a great model for other states,” Ranchod says. Due to CSI, California was “able to build a healthy and vibrant solar industry when other industries suffered from the recession.”

PV aid for low income housings

Two small portions of the CSI budget are dedicated to affordable/low income housing, under the Single-Family Affordable Solar Home (SASH) and the Multi-Family Affordable Solar Housing (MASH) program. The SASH program, which is run by Grid Alternatives, a non-profit group, recently announced a partnership with Yingli Solar to make them the “official solar module provider.” Yingli in exchange has made the largest donation in the non-profit group’s history. Grid Alternatives, which works with cities on housing projects to revitalize neighbourhoods, is implementing solar power for residents of affordable housing, who would otherwise not be able to afford to switch to renewable electricity sources.

But despite the high incentives under SASH and MASH – between US\$ 4.75/kWh and US\$ 7/kWh – most often the complete costs of a PV system still cannot be covered. “The families we work with don’t have a savings account and even US\$ 1,000 is too much for them,” says Stan Greschner, SASH Program Director. “That’s when Yingli steps in to fill the gap.”

Embedded in the CSI program, SASH includes not only homeowners but volunteers from the whole community, when a solar project reaches a roof. “We go above and beyond,” says Greschner, offering job training for solar installers on site to get hands on experience, a “100 % workforce developer opportunity.” Since the first installation in May 2009, Grid Alternatives deployed 550 systems. The goal through 2015 is between 4,500 to 6,000 solar roofs all across the state of California. Greschner says, his group actively shifts the perspective of what a solar customer looks like from a “wealthy inspired individual to mainstream.”

Anja Limperis

Volunteers and job trainees are helping with the deployment of a PV system for a family in affordable housing in San Luis Obispo, one of the projects Grid Alternatives sponsors in the framework of the SASH program.

Photo: Grid Alternatives

