Lessons from America's 50 power markets

Credit: White House/Pete Souza

State energy policy | Acceptance of solar in the boardrooms and living rooms of America along with President Obama's Clean Power Plan potentially put the US on the precipice of huge solar growth, but the patchwork of state solar policies remains a barrier. John Parnell and Tom Kenning look at some of the US' leading solar states and ask what others could learn

With 50 electricity markets buzzing away, countless lawyers and myriad regulatory frameworks, the US is a fertile breeding ground for inventive and original ideas around energy provision. It is also a great test bed for how to deal with some of the inevitable opposition that can arise when change is injected into an industry that has had the same business model for 100 years and more.

President Obama has set the country on a path to a cleaner energy future, one with a natural place for solar. There are several possible routes and a lot can be learned by other states and beyond by looking at what has worked so far.

"There is so much churn going on right now on all these different levels. It's a very dynamic time," says Amit Ronen, director of the George Washington University Solar Institute.

Ronen and his colleagues have been assessing policy progress in different parts of the country as part of their Interactive Map of Leading Solar States project.

"Lots of people are looking to see what the best steps are, it's hard to find one general trend and say this is the direction everything is going in. Here in the US we have essentially 50 state electricity markets," Ronen adds.

While many utilities are doing more than merely fulfilling an obligation to deploy solar, the majority are putting up more resistance. Working with them to overcome their inertia and promote the benefits they can reap is a big challenge for the industry.

Barack Obama's Clean Energy Plan is looking to up the ante on states to embrace low-carbon energy.

"There is a century of regulation and legislation geared towards a different system; a lot of these bigger firms have multi-billion dollar investments that they had assumed would amortise over 20 to 30 years," says Ronen. "They expected a certain amount of revenue and now with a shift to new resources, it's a stranded asset. They have to figure out who is going to pay for that. Things are changing so rapidly. We have never seen anything like this in the history of the utility industry."

Looking at what has already worked is one way to ensure these rapid changes are executed in the best possible way.

CALIFORNIA – MOVING PAST THE GOLD RUSH

With a huge installed solar capacity and as the base for many of the biggest domestic PV companies, California should always feel like home turf to the US solar industry.

An ambitious renewable portfolio standard (RPS) of 33% by 2020 has helped the state meet its voracious demand for power. With falling levels in hydropower dams and around a third of the state's electricity being imported, solar has provided the perfect solution.

Net metering, meanwhile, has given residential customers the ability to cut their power bills by receiving the full retail rate for excess power sent back to the grid. These two drivers have propelled the state to runaway leader position for solar power in the US.

"California has always been a leader on a lot of these solar policy issues since the 1970s. Obviously they have a large economy and population but they are by far the leader. They put in 4GW just last year, which was more than the entire country in the previous 30 years through 2011. They have over 10GW now," says Ronen.

Observers of markets in Europe and elsewhere cite the absence of direct subsidy as a boon for solar. Hamstrung markets in Spain and Greece look on with envy. But even California's supportive measures are under threat, despite the appetite for them, and their apparent success.

Net metering is under heavy attack with utilities proposing additional charges for participating customers and a reduction in the full retail payment for exported power. The anti-net metering lobby claims solar drives up the cost for residential customers, a claim repeated around the country and reinforced in TV ads by the Edison Electric Institute, which represents utilities.

With the approval of Governor Jerry Brown and the state senate, an increase to an RPS of 50% by 2030 is on the cards but it is not quite a done deal. California showcases the benefits of an aggressive pursuit of solar. Its next job could be to show emerging solar states how not to become victim to their own success.

NORTH CAROLINA – BACKING FEDERAL POWER WITH STATE POLICIES

On the opposite side of the country from California, North Carolina has quietly deployed more than, or just under, 1GW of solar power, depending on who you ask. Much of this was driven by its RPS and a series of state tax incentives for renewable investment that could be claimed on top of the federal investment tax credit.

"The latest number we have is 984GW," says Allison Eckley of the North Carolina Sustainable Energy Association (NCSEA). "That's largely down to the suite of clean energy policies that have been passed here in just the last few years. The RPS, Senate Bill 3, requires 12.5% of North Carolina's electricity to come from renewable sources by 2021."

The state has a monopoly utility, Duke Energy, which was part of the bipartisan talks that created the RPS (talks which lasted two years) and backed the proposals. "Duke was supportive and it has far surpassed the amount of solar that it was required to bring online," says Eckley.

"We're on about 6% of the 12.5% requirement, which is supposed to increase in the future but there is a bill on the table that would freeze it at 6%. Duke has not gone on the record to say it supports it or otherwise. I can't speak for Duke, but I can't see why they would be against the RPS at this time," says Eckley.

Ultimately, the story in North Carolina is similar to Europe. Where European countries want to wean themselves off feed-in tariffs, Eckley wants to see even tax incentives phased out and solar compete with other technologies. She believes the RPS is doing a good job at driving the levels of deployment required to ensure that happens.

Credit: FLS energy

North Carolina has quietly become one of the leading US solar states.

In the context of the Clean Power Plan, Eckley says North Carolina's existing policies should position it well for compliance while some nearby states that have been less supportive will face some "pain" when looking to match the requirements of the Clean Power Plan.

TEXAS – MARKET FORCES TAKING HOLD

While the best solar resources can be found in the south west of the country, one obvious candidate with lots of open space, large population centres and proven pedigree in the energy industry – albeit in the oil and gas sector – has remained relatively quiet on the solar front. With a deregulated electricity market, Texas offers tremendous opportunities for solar.

"Texas is coming on pretty fast," says GW University's Ronen. "You have incredible resources and it has always been a mystery why wind has been such a dominant player in Texas and no one has really looked at solar."

Developer OCI Power and First Solar have scored a number of successes in Texas including merchant PV power plants. A 10GW RPS target by 2025 was surpassed in 2010 (largely through wind) meaning the impetus for development is not linking to any impending deadline. The Renewable Energy Credits (RECs) traded between utilities provide additional project revenue and continue to encourage development even with the RPS fully realised. But with prices reaching record lows in Texas, the market is as bigger driver as any.

"Austin Power, a co-op, is always a leader in the state in terms of trying new and innovative things and trying to be greener. They recently signed a sub-four-cents PPA, which I think shocked a lot of people because there is really nothing that can compete with that on any level," says Ronen. "That's not even considering the additional benefits of solar."

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NEW YORK – VISION AND VULNERABILITY

New York has always had an ambitious RPS with an initial renewable energy goal of 25% by 2012, but it now has an RPS of 50% by 2030, which is one of the most ambitious goals of any state in the US. It is also targeting an overall 80% reduction in greenhouse gas emission by 2050.

All of the plants coming out of the state are now falling underneath the umbrella of its 'Reforming the Energy Vision' (REV) strategy, which aims for a clean, resilient and affordable energy system for all New Yorkers. The vision also proposes the Clean Energy Fund, a US$5 billion investment over the next 10 years in clean energy programmes.

The strategy, spearheaded by New York governor Andrew Cuomo and his so-called 'energy tsar' Richard Kauffman, also includes the US$1 billion NY-Sun Initiative, which has driven a strong market in the state for rooftop solar. The purpose of the NY-Sun initiative is to see a stable, long-term decline in the subsidies that the state provides for solar systems until they can rely on fundamental economics alone.

Solar in New York has grown more than 300% from 2011-2014, at twice the rate of solar growth nationally. A total of 314MW of solar was installed as of December 2014 and the ultimate goal for distributed solar is to have 3GW by 2023.

Jamil Khan, energy policy and electricity markets specialist at SolarCity, says: "The real spark to the powder keg came from Hurricane Sandy. It was a startling realisation by the administration and the people of New York that their energy infrastructure was completely outdated and not as clean as it could be with the addition of renewable energy. Hurricane Sandy really illuminated the fact that we rely on a large, central system that has a singular point of failure."

Credit: Governor Andrew Cuomo

New York governor Andrew Cuomo has been a champion of low-carbon energy.

Khan says it resulted in New York moving towards actually capturing the value in renewable and distributed energy, instead of just handing out grants and incentives.

For further insight into the role of storage in New York's REV plan, turn to page 88.

MINNESOTA – LAW AND ORDERS

In a landmark ruling at the end of 2013 an administrative judge in the US state of Minnesota ruled solar generation to be a better investment than natural gas for utility, Xcel Energy, to meet its 150MW capacity target.

The case may have set the tone for a boon in solar deployment, having received widespread national coverage in the media, but it was the policies in place ahead of that ruling that made it possible.

For example, Minnesota ordered environmental costs to be quantified and then included in planning back in the early 1990s. More recently it has brought in a renewable preference law, which means the State Commission cannot issue a certificate for a non-renewable project unless the utility has shown that it has considered a renewable project and that it is not in the public interest.

Minnesota also has a very aggressive RPS – 30% by 2020 for Xcel Energy, the state's largest utility, and 25% by 2025 for other utilities in the state.

The Aurora solar project, developed by Geronimo Energy, as a result of the Xcel ruling, could also be used to reach the state's solar energy standard.

Furthermore Xcel energy said it is working on solar plants at all scales in order to meet Minnesota Legislature's goal of 10% solar power on its system by 2030.

Betsy Engelking, vice president, policy and strategy at Geronimo Energy, says: "Solar has really exploded in the state of Minnesota. Aurora was the leading edge of it."

However she says legislation had addressed solar from the smallest to largest scales. It improved net metering by increasing the threshold from 40kW to 1000kW. It also included community solar projects, which allowed customers to participate in a programme of virtual net metering into a community solar garden of 1MW or less.

Engelking says that as a result, there was around 10MW of solar in the state in 2014, but by the end of 2016, the state is expected to have around 1GW of solar spread between utility-scale projects and community solar gardens.

Solar analysts on Obama's Clean Power Plan

Shayle Kann, senior vice president, GTM Research

The final rules are definitely a net positive for solar. There's a higher renewable energy target of 28% by 2030, up from 22%, and there is some language around the rules more rapidly creating a switch to renewables rather than encouraging coal-gas switching, which is disincentivised. That's got to be a good thing for solar but how that will be implemented remains to be seen. It's going to be a long-term impact not a short-term impact but we'd rather see big long-term requirements rather than earlier implementation.

Via the Clean Power Plan, states are going to have to ramp up their renewable energy significantly over the course of the next 15 years. One thing that would make it a lot easier to do that is if the ITC is extended. It places a lower burden on states to create mechanisms to get solar online if the ITC is extended on its own.

Finlay Colville, head of Solar Intelligence, part of *PV Tech Power* publisher, Solar Media

On the surface, there is probably not a solar industry globally that would not want to have a leader that gave a long-term vote of support to renewables, regardless of policy detail or the prospects for implementation. Imagine that occurring in the UK or Australia, for example.

There were certainly two parts to the speech however, and these should be considered separately. The first is based on "America leading the way forward". Has the rest of the world not been waiting for the US to participate in global climate change directives for years? It is hard not to remember the reaction in the US to the Kyoto protocol for example. But again, for the renewables and solar industries in the US, why should they even care about this?

The second part of the speech is simply about creating a more binding requirement on all states to cut emissions. Solar deployment in the US has until now largely been confined to states that have passed renewables targets, so potentially this could accelerate solar in the US significantly and across a much wider range of states. ■