'Govts should get out of the way of solar'

BY INDRAJIT GUPTA & C.S. SWAMINATHAN

In the past decade-and-a-half, solar energy has evolved and is now emerging as a major force of disruption in the energy sector globally. Tony Seba, thought leader, author and an expert in the clean energy and transportation space, points to the fact that solar is the cheapest source of electricity right now; its penetration in the residential and commercial sector is high in many Western countries and it is already forcing a rethink for the central utilities-based power-generation model.

In an exclusive interview done in Mumbai last week on the sidelines of an annual lecture in memory of former president A.P.J. Abdul Kalam, organized by the Unifi Foundation, Seba talks about the way solar energy is disrupting the energy sector globally and how this might play out in India. Edited excerpts:

What really changed in the solar space? What really brought about these new disruptors into this space? Perhaps not just solar because we spoke about other things (in your presentation). Is there a new generation of start-ups that are coming in which are far more ambitious, that are global in orientation? In India, we have seen Uber step in and conquer. What has changed?

That is a good question. So, in California around about 2009, basically there was a new company called SunEdison—(founded by) Jigar Shah—and he came up with this new business model called "zero money down" solar (where SunEdison would set up and manage the solar power system for free and in return, the customer would sign a power purchase agreement (PPA) to buy the power it produced at a fixed rate over a long period). That was what tipped solar in the US in California, which is 50% of the market. Now, I am talking about residential and commercial. It was a business model innovation. And then pretty soon SolarCity, Sungevity, you know all these other companies copied that model and boom! It took off.

You can actually map out the growth in numbers of installed solar—not utility-scale, but installed residential and commercial—to when they introduced that business model innovation. So, it was a business model innovation. I mean, before that, solar companies were pushing folks to buy $20,000-30,000 solar systems. The average American makes $30,000 a year, so it's a lot of money, even if you own a house and so on. Once you go into the monthly or PPA model, then it is affordable—it is $80, $100 a month, so that changed everything.

What sparked the idea, to your mind? What did they see that others didn't?

You know that the (Silicon) Valley is very interesting in that there are a lot of people experimenting and I think that has been part of a huge portion of the success of Silicon Valley, its culture, that allows for failure. Failure, as long as you learn and don't repeat the mistakes, is considered OK. Even the very definition of start-up companies is now basically companies looking for a business model, right? So, basically that is what happened—a lot of people experimenting and boom! Jigar came up with that business model and everybody copied the successful business model, like they still do, right? Same thing with Uber and Airbnb and so and so forth. So, I don't know that Jigar had specific insight. Probably he is a really, really smart guy, but I would attribute it more to the whole experimentation culture of Silicon Valley.

At one point in time, the US federal government, as part of the bailout deal, gave a lot of money to solar and it didn't go that well. The investments weren't really paying off and there was a lot of angst among the taxpayers. So, while it may not have been commercially viable, did that in any way trigger a change in the way the Valley looks at that opportunity?

Not at all. (To say that) it did not work, is not true. Basically, they say more than 95% plus or so of their investments paid off, which is better than you can say about venture capital. So, it did basically get caught up in the whole political thing and that is what the media basically focused on. You know, I—not then and not now—don't think the government should be involved in energy or anything like that—more now than then. The government invested in Tesla, right? That was pretty successful. The government invested $500 million, right? And they invested in—so, I am not justifying them. I am just saying that the notion it was a failure is not true. And the notion that it was a lot of money—it wasn't really that much money. I mean at the same time the government tripled subsidies for nuclear (energy), right? It was an order of magnitude more than solar ever got. The media never focused on that. So, I don't think that changed anything actually in the Valley.

Did it accelerate innovation and technology because new investments came in as part of that?

Not really. In their mind, around 2008 or 2009 or so, actually a little before that, before the crash, Wall Street, essentially Sand Hill (Sand Hill Road in Menlo Park, California, synonymous with venture capital) discovered solar. There were a 100 plus venture investments in photovoltaics (PV)—I don't remember what the right number was—essentially they, like a lot of people around the world, discovered solar and they just invested left and right. They just invested in PV at a time when China came into PV and lot of these companies basically did what they said they would do. I mean they executed according to the business plan, but once China came into the market, everything changed because the cost basis just dropped dramatically.

It wasn't the government involvement. It was that at that time essentially the world—Europe and China and Japan and the US—discovered solar and they saw it as this thing that might get to be a mainstream thing pretty soon. And it turned out, a lot of VCs didn't understand energy, and now they understand it better, of course, because of the failures. Basically, what happened was that VC funds took semiconductor VCs and they went like "Oh, PV was just another semiconductor kind of thing, silicon or whatever." They did not get energy at all. It was mind-blowing how little they understood. That was part of the failure of a lot of these companies too. The government gets blamed, but it wasn't the government.

But you know, despite everything, despite all the conversation, solar has been growing at a CAGR (compound annual growth rate) of 41% since the year 2000. What has happened is that the epicentre of solar has shifted. It used to be Germany since 1999 and then it was China and in the US, it has been California mostly. So, it shifted around. Italy was big for a while, Spain was big for a while, but on the whole, globally it's been growing non-stop.

In your presentation, you spoke about India, Brazil and China. In India, we are getting started, the government has been fairly ambitious in that sense, but Brazil invested in biofuels, I don't know how that goes...

Badly. You saw my slides.

So, how do you see the emerging market play evolve? I know China is well ahead.

It's ahead in terms of making PV, right? There is a whole value chain that a lot of folks don't look at. Anyhow, China dominates the PV manufacturing part of the value chain, no doubt. But the money is being made here, upstream, by the SolarCitys and the Sungevitys, by the integrators and by the solar plant developers. So, the lower the cost of PV, basically the more money they get. It is like value chain 1.1.

So, what I briefly mentioned (in my presentation), of all the router companies—you had several competitors at the time—they don't exist anymore. Cisco itself did well, but if you look at who got most of the cash and the market valuation out of this whole Internet thing, it was the software companies. It wasn't Cisco. I mean Cisco did well, but it's Google and Facebook and Alibaba and I consider Apple to be a software company mostly. So, it was those companies that made money off the growth of the Internet and not the folks who laid out the infrastructure. And all that is to say that there are layers. Right now, there is a lot of innovation happening in software and in business model innovation. One example of that is, I am a part of an accelerator—and there are a 1,000 in Silicon Valley and elsewhere. But this accelerator focuses on solar software and business model innovation—that is it. No hardware. Inside of two-and-half years or so, it has grown fantastically—30 companies and a couple of them have raised hundreds of millions of dollars by now doing business model innovation and software. So now, Silicon Valley sees that as the next thing. Not the infrastructure, not the PV. VCs are not funding any PV anymore—with exceptions, with outliers and whatever. But not in Silicon Valley anymore. And unless there is a breakthrough of some sort—and there will be—basically it is not going to happen anytime soon.

Storage is where the money is going now, not PV.

A lot of the trigger for innovation in alternative energy, if I were to look at it historically, happened when the oil prices went through the roof. Looking at ways to find alternative ways, oil at $100 a barrel... what do we do? We are at a point in time where oil has been largely very stable at below $40 for the past year, $50 now and so on. Is this in any way going to impede the kind of stuff that is happening in the alternative energy, solar and the fossil fuel-based energy sources?

The answer is no. So, the answer to the first question is yes, Wall Street discovered solar when oil shot up to $140 a barrel. It is interesting because solar doesn't really compete with oil, except oil, diesel and kerosene, but diesel specifically. Fuel oil generates only about 5% of all the electricity around the world. So, it's part of the "they didn't get energy" kind of thing—they were like "Whoa! Oil is here, let's invest in solar", but they don't really compete, except in diesel markets and in kerosene. But then, other sets of companies like EVs (electric vehicles) did benefit from that. But the whole investment thing into solar because of oil prices—they are different markets.

Have they decoupled that thinking? Like you said, that was a trigger, but it is a thinking now...

Yes. So, many years later and a lot of money lost later, they understand now that solar and oil don't really compete. The EV is basically going to disrupt oil, so that thinking has changed dramatically. But at the time, it is energy as energy, right? So, in Wall Street, you had energy analysts. That is it. You didn't have analysts who focused on... because solar was not big enough, EVs were not big enough and batteries were not big enough, you didn't have analysts who focused on those kind of industries, let alone high-tech. If you think about Tesla, is it a power company? Is it a high-tech company? What is it? So, Wall Street was confused for a while about what energy is all about. But right now, it is much better than it used to be.

The other thing that I found quite interesting was the point you made about what this is likely to do to a traditional utility company and how their business model gets blown to bits in some ways. Do you see any examples of utilities that have been able to reorient themselves given the conversation that we had earlier about solar becoming mainstream?

I will give you a few examples from Germany. Germany started the solar plus wind adoption earlier than pretty much anyone else. Solar definitely. Wind was there first in Denmark and then Norway, but Germany certainly was a solar pioneer. So, they have a high penetration of solar and high penetration of wind. When you have high penetration as they do, essentially solar and wind are both zero marginal cost, and if there is a wholesale market for electricity, nothing can compete with zero marginal cost. So, the central generation model of German utilities got blown to pieces because of that high penetration. So, over the last few months, you have seen two of the largest utilities in Europe, RWE and Eon, split up. Essentially, they both had to. They weren't happy about it, but they split up. On one hand, they have the solar, wind plus transmission business. Then you have the central generation business and another what they call "bad bank". The media in Germany borrowed the term from the Wall Street collapse—the bad banking. So, now they call the central generation the bad banks—for both Eon and RWE. But they had to split up along those lines.

Is that the direction you reckon utilities will (need to go)?

They have no choice. The central generation model is obsolete already. They can't compete.

That is in Germany. You reckon that will (happen) quickly around the world?

So, Germany because penetration in Germany is higher than anyone else. So, where you see high penetration of solar especially, then you will see this happening.

Australia is another example. In Australia, you have 1.5 million solar homes. In landmass, Australia is a big country, but it is a small country in terms of population—so that is about 20% plus of penetration in the residential market. So, utilities are feeling the pain already and they are having to adapt. The coal industry is feeling the pain and the transmission operators are feeling the pain already because they forecast this growth in energy and, in fact, it is gone like this for central generation (gestures downwards). Energy consumption did go up but that was all solar. So, now you have utilities like AGL in Australia that are basically getting into the solar business, that are getting into the EV charging business. So, they are getting it. Initially, the first reaction from utilities is "Whoa! Let us talk to the government. Let's push back and change regulation" and so on and so forth. Depending on the country basically, that is what they do first. But after a while, they call like "Whoa! We have to either get into the market or in the case of AGL and Eon and so on, basically split up and get into the market another way by splitting up the business."

Commercial, malls, industry, they are going to want to produce their own energy. And that is already happening in many markets basically because they can control it

In markets like India, where the solutions are maybe relatively slower, do you reckon a different kind of strategic options will come into play where you get an opportunity to play both?

India is interesting in that. Now, (power minister) Piyush Goyal has said that solar is already cheaper than coal. So, that is done. So, now it is a matter of adoption, of making it happen. But in India, there is no residential and commercial market. That is an issue. So, the business model of utilities is being preserved because most development here is central generation. Large solar power plants. So, those are not disruptive to utilities the way that distributed solar is. So, that business model is still being preserved. I would assume that at some point, regulation is going to change and it is going to allow rooftop and commercial solar companies to exist. And that is what is going to be disruptive. From a cost perspective, this is a sunny country.

But we do have very large transmission losses. That is one of our biggest challenges. Can't do much to control it either.

So, this market is highly... from that perspective right. A lot of government intervention, the government owns also parts of the value chain, transmission, coal and so on, losses. It is a very interesting market that way. But even then, the fact is, for large portions of this market, it is not just about cost, it is also about getting energy at all. It is shockingly not up to standards and so when you have folks investing in buildings and houses—in real estate markets are so expensive and they don't get access to high-quality electricity, they are going to want to produce their own energy. Commercial, malls, industry, they are going to want to produce their own energy. And that is already happening in many markets basically because they can control it. It is cheaper, they can control it, it is high quality, they can store it. That is essentially going to start happening also because of the quality of the grid. I think that is going to be a growth area—if the government again from a regulatory perspective, this is a government that is part of the energy industry and so we need a bit of unbundling and deregulation in order to let this market for solar happen more quickly.

It is going to happen eventually, but it is going to take more time.

My message to the government, to policymakers is, if you want this to happen—meaning, this solar industry grid, especially the climate portion—if you want a zero carbon energy and transport infrastructure, then get out of the way.

Essentially that is (my) message. When I spoke at COP21 (the United Nations climate change conference in Paris in 2015), that was my message. It was not necessarily well received (laughs) because a lot of government officials think that this whole thing is happening because of them. But some governments did get it, specifically in Northern Europe, some governments have already unbundled utilities—historically Australia and New Zealand. Chile does not subsidize anything directly or indirectly. So, you are starting to see really high growth in solar in Chile. Yes, they have great sunshine, but also the government does not subsidize anybody and therefore the least cost option gets to win. And right now, solar is the least cost option. It is cheaper than anything—cheaper than gas, cheaper than oil, cheaper than coal, cheaper than anything. I mean it is still going down. In Abu Dhabi, 2.4 cents. That's half of the cost of coal.

Indrajit Gupta and C.S. Swaminathan are co-founders of FoundingFuel.

Read the unabridged interview at foundingfuel.com

feedback@livemint.com

Solar has not disrupted Indian utilities because of the focus on the large plant model instead of rooftops, says Seba. ABHIJIT BHATLEKAR/MINT

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China dominates PV manufacturing, but the money is being made upstream by solar plant developers such as SolarCity, says Seba. AP