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ESG Now Podcast

“Solar, So Hot Right Now”

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Bentley Kaplan

Hello, and welcome to the weekly edition of ESG Now, the show that explores how the environment, our society and corporate governance affects and are affected by our economy. I'm Bentley Kaplan, your host for this episode. And on today's show, we are going to hop onto the proverbial launch pad of solar power. All up and down the value chain of this renewable energy, stakeholders are aiming for and hoping for massive expansions in solar capacity. On today's show, we're going to look at which companies and industries are lining up to try and make this happen. What factors stand in their way and what ESG data can tell us about their future prospects. Thanks for sticking around, let's do this.

So, I'm recording this episode in the dark, and that's not just because I've flirted rogue-ishly with deadlines, which means after-hour podcasting, but also because South Africa remains in a years’ long electricity crisis. And the worsening availability of energy has led many South African households to install their own mini solar systems, turning the country's abundant sunshine into convenient outputs like a toaster, a router, or even a lamp. And there is something hopeful that comes out of the seemingly magical process. But outside of South Africa, many others are looking at solar through a much wider lens, not only for its capacity to provide more energy or decentralized power source to a growing world, but for its capacity to mitigate climate change. And in this mission, solar energy really does hold a lot of promise, but if it's gonna help us really slam the brakes on climate change, models are showing that it needs to be scaled and scaled very quickly.

And the same goes for wind, the other commercially advanced source of renewable energy. Both of these energy sources have a lot of climate pressure on their shoulders. And near the end of this episode, we'll put them alongside each other to give you a taste of how their growth trajectories might differ, and also what key ESG risks they have in common. But I digress. Let's put wind energy to one side and follow the sunshine for now.

The International Energy Agency reckons that if we're going to stick to a net zero emissions pathway by 2050, then between 2020 and 2030 we'll need to take global solar capacity from 734 gigawatts to over 5,000 gigawatts, which shakes out at an annual growth rate of about 21%. The network for greening the financial system or NGFS thinks it needs to grow even more quickly at an annual average of about 39% in the decade from 2020 to 2030.

And either of these scenarios is daunting. For this massive growth to happen, the solar value chain is really going to have to chug along pretty quickly. And that demand is going to hit all different parts of the value chain starting at the very top, which will be things like mining and sourcing raw materials like

quartz, polysilicon, silver and lithium, and then going on to the next cluster of activities, which would be manufacturing components like ingots, wafers and solar cells. And then onto the companies that are actually going to generate and sell electricity, both through electricity grids and in off-grid applications. Now, to better understand what this potential growth could mean for different companies and industries and even regions, I've grabbed Mathew Lee, who is based in our New York office, together with colleagues. Mathew has been looking to answer these questions using our ESG and climate data. And to warm him up, I asked Mathew to tell us more about which companies or industries are looking to bridge this gap, this big gap of where solar is now and where it could be in 2030 or even 2050.

Mathew Lee

There's the usual suspects, if you will, the utility companies who already operate, you know, over a gigawatt of solar capacity, but perhaps have ambitions in their pipelines. Usually a couple multiples of that. So Engie, Dominion, Enel these are some utilities that have deployed a lot of solar already, but they anticipate to deploy at least two. And for Enel, up to eight to nine gigawatts in their pipeline of solar over the next decade or so. So there are utilities, investor own utilities we're familiar with. There's also private energy developers. Those are big players too. Pine Gate Renewables, they are pretty active, for example, in the US and winning contracts and developing out large solar pipelines. Either as an asset class, they continue to hold or we've seen some of them get acquired.

That's where I think another industry steps in, which is the large oil and gas majors. Some of them hold a pretty significant solar pipeline too. So Repsol, Shell, Total, they all hold at least three gigawatts of solar capacity in their pipelines. And for example, Total, that's been built by acquiring portfolios from private energy developers. And a bit surprisingly we also see some big, shall we call it public infrastructure bets. So we saw the regional development authority in India, a smart city initiative there because they have a five gigawatt project that's been approved and is, um, in construction that puts them as one of the top pipelines in the world, as well as OMERS, a pension fund in Canada where they directly have begun managing solar assets into their portfolio. And that's actually resulted in years of building this portfolio has led them to become a leader in terms of future solar pipeline.

So that's the landscape of the type of sub players in here. And I think in terms of thinking about pure plays versus diversified, an interesting finding for us we had is that by absolute scale, it's actually those where solar is a diversified part of their power generation portfolio that have the most solar deployed right now. In China, there is the Three Gorges, these folks have already installed multiple gigawatts of solar capacity, whereas, uh, the pure play solar developers, we see most of them in China and India as well as Sunrun in the US. Their current installed capacity wasn't as high as some of these other diversified leaders, but most of their portfolio, you know, over 90% is in solar assets. So that's the, the profile of different major solar players.

Bentley Kaplan

Right. So there are some big moving pieces behind this solar ambition. The type of expansions that the International Energy Agency or the NGFS have included in their net zero projections will need

collaborative efforts across the value chain and between the public and private sectors. And there are some very big companies that are leaning into this trend, but these growth plans have some Ts and Cs, some asterisks against the big numbers and soaring trend lines. It seems that quite a number of pieces will need to be in place for things to go according to plan. And in his research, Mathew took a closer look at the question of feasibility, whether this ambitious growth could be achieved by small incremental changes or whether companies would be looking more at big technological jumps. Now, one set of data that he could draw on was how much revenue companies were earning from solar related applications, both relative to their overall revenue and in absolute terms, and how much they were planning to develop, which in some cases was many multiples of current capacity levels.

And knowing this current revenue picture will be one piece of the puzzle for investors, but given how quickly technology can develop, they'll also want to know how competitive these companies might be in a few years' time when the landscape has changed completely. And for that more forward-looking analysis, Mathew looked at data on technology opportunities under MSCI's climate value-at-risk model. A key component of this analysis looks at what types of patents a company holds, and not just how many patents, but what kinds of patents, what technologies they are linked to, how new they are, how broad and how influential. And this data essentially gave Mathew a sense of the intellectual positioning of different companies, essentially how big their intellectual property muscles are. And putting all of this together gave him a pretty interesting view of the solar value chain.

Mathew Lee

In absolute terms of this metric, we did see quite a few APAC companies rise to the front. So I think 19 out of the top 25 solar patent holders in our data were based in Asia, and some of the leaders were LG, Kyocera, Panasonic, and Total Energies. The other input to that is current revenue breakdown. And so the idea here is if you're already involved in this type of technology, maybe there's a first mover advantage, or you already have developed some expertise and have the existing know-how to continue growing this part of your business. And so here the story is that most of the panel manufacturers and developers obviously are going to be specialized the most in terms of their solar related revenue is closest to a hundred percent. This would be companies like First Solar in the US, and in China, JA Solar, JinkoSolar and Longi Green Energy Technology.

These types of companies basically build their entire revenue stream around solar related businesses. And again, I think when we look at revenue in terms of bringing the market forward and letting it develop, let's bring that absolute versus relative lens back again, right? So the total amount of revenue being generated from solar at Total Energies, even if it's 8% of their total revenue, the volume of that money might exceed some of these pure players I just mentioned that are equipment manufacturers. And that sounds, that might sound a bit counterintuitive, but when you think about how Total for example, has one of the largest solar pipelines in the US, they hold one of the most planned contracts based on acquisitions of like ClearWay Energy, Core Solar over the last couple of years. These really big private energy developers, it does fit the numbers of what we found that for some of the diversified energy companies or utility companies, solar might not be more than 50% of their business, but the total amount of money they're generating from solar can be quite sizable.

Bentley Kaplan

Right. So of course not all companies are equal. Some really stood out in terms of their patent portfolios and for others they've gone for a pure play strategy all in on solar technology or generation. But investors will also be thinking not only about what percentage of total revenue a company is making from that solar value chain, but about the absolute size of that revenue, because Mathew found that some companies that you would mentally file away under “oil and gas giant” are actually starting to generate sizable revenue streams from solar energy and infrastructure. But for all the encouraging projections, it's not all sunshine and rainbows. Things have and may still go wrong for these solar tinted dreams. To give you more of a feeling of how things could go wrong, try and remember as far back as the height of the Covid-19 pandemic and trying to buy something only to be met with a shrug and a vague gesture to quote supply chains. And that'll put you on the right track. But much better than a vague gesture, Mathew provided a healthy reality check on some of the bigger challenges that may lie in store for the world's solar ambitions.

Mathew Lee

I think of two supply chain risks and then one larger macro one. So, the two supply chain ones are related to critical minerals as well as upstream labor. So, for critical minerals if we are to continue with this International Energy Agency scenario of deploying solar to reach a net zero world, we could be seeing demand for lithium spike 42 times of 2020 levels. And so that's going to put a lot of stress on sustainable mineral sourcing, but also even just the raw output of being able to mine and process and ship all of these minerals out. And so any sort of delay in getting that level and, and, and scale of minerals out of the ground, that could be a bottleneck for growth. The other supply chain issue comes a bit from geographic concentration. So, China's a major hub along multiple steps of the solar panel manufacturing chain.

So whether it's creating silicon wafers, cells, about I think 60% of global lithium processing goes through China, 79% of, polysilicon for solar panels and 97% of global solar wafer manufacturing capacity comes from there. So strong geographic concentration here. And that can be a bottleneck too because there are some legislations out there now like the Uyghur Forced Labor Prevention Act in the US that take an approach that unless there's clear and convincing evidence that the product has not been separated from forced labor allegations is assumed that it is associated with potential force labor. And so that can lead to some complications with importing the panels needed to fit with companies’ growth ambitions and outside of the Forced Labor Prevention Act, you also have in, in US Congress right now debates over solar tariffs on Southeast Asian nations. And so that again continues to be a geopolitical slash supply chain issue. The final macro risk is the high inflationary environment we're in right now, a higher cost of borrowing. And when you have a capital intensive new renewable energy project that can really complicate some of the project economics.

Bentley Kaplan

So things will not necessarily be straightforward. There is a complex value chain that solar power relies on, but Mathew also told me that there will always be some level of unpredictability about how companies might respond to these opportunities. And so I nudged him to share some of the more interesting surprises from his research with me and with you.

Mathew Lee

Yeah, uh, one is some of the strategies of specific companies that we found just doing research into them. So for example, Hanwha, this big Korean conglomerate that's already popping up when we look at both their solar manufacturing side of things, in terms of their intellectual property and their revenue, seeing them make a 2.5 billion investment in the US while we were doing the research in response to the Inflation Reduction Act. So that's interesting to see how despite, you know, new geopolitical or policy developments related to solar, you see companies pivoting in response to that. I was surprised to see a pension fund as a top holder of a solar pipeline. That wasn't really on my radar that that was an asset class that pension funds interacted with, but the more I thought about it, it made sense. It might also fit in with their goals as a pension fund too. So that was a cool finding. Two more areas we didn't get to cover here, but also will be exposed to the solar value chain. One is the wiring. So how are you going to bring all of this energy and connect it to the grid and bring it to homes? That's a big opportunity. And batteries, right? The sun doesn't shine 24 hours a day. So incorporation and more advancement in battery technologies will help enable more deployment of solar.

Bentley Kaplan

And in addition to these findings and thoughts about how interdependent technologies might be affected by a potential solar boom, Mathew also reflected on solar's geeky cousin, wind energy. Because getting on track with net zero ambitions will need massive growth from both of these renewable technologies and companies and investors may well be watching both with equal interest. So in that vein, I asked Mathew to give me a little taste of how these two technologies might compare what investors might want to know, and critically how much they have in common in terms of ESG risks. Well, as much of that as Mathew can cram into 90 seconds,

Mathew Lee

They're often grouped together as the most commercial renewable energy technologies out there already. And we wrote a wind paper, which we have an old podcast on from last year with a similar approach. And there, it was clear that the ambition of companies, so their wind pipelines, weren't on as big of a multiple as their current wind deployments compared to solar. So what that tells me is that people have much more aggressive ambitions with their solar portfolios, and that's probably due to an easier ability to deploy solar projects compared to wind. Wind, whether it's large offshore or onshore, just the size of these projects and the engineering, you need much more specialized and perhaps we see in solar, not only do people have higher ambitions, but there's more involvement from other industries because it's easier to acquire and step in and manage these assets compared to wind.

Wind and solar – both of these projects can be a bit land-intensive. And so when we have our ESG hats on, managing the community relations as well as biodiversity and land use, these are very real risks with sighting projects and bringing them from winning the contract all the way out to actually building them. And so, the type of best practice and partnering with local communities is something that continues to show up a as a key ingredient for success. Nimbyism, not in my backyard, is very strong

everywhere in the world. And so it's not just about building a great solar pipeline on paper. That's where some of the expertise of we've already done this at scale before, can really come into play and show its value.

Bentley Kaplan

Right? So Mathew has left me with a lot to think about, a bit like the candle sitting alongside my laptop. Mathew's data has helped to cast some light over the solar value chain. But this data can sometimes raise more questions than answers. Investors may be mentally adding up the prickly list of challenges that lie in store for solar expansions from things like sourcing exponentially large quantities of raw materials to supply chain headaches and geopolitical tension, and then to the environmental and social challenges that come with a large-scale rollout of renewable energy projects. Which is not to say that there is no reason to watch the impending launch of the solar value chain with enthusiasm, but it is maybe a timely reminder of how textured the risk and opportunity landscape can be.

And that is it for the week. A massive thanks to Mathew well, his take on the news with an ESG twist. If you want to hear a little bit more about wind energy and a little more Mathew, then check out our episode from the long, long ago of June, 2022 called Windy ESG labels. But before you do, I want to say thank you very much for tuning in, even though I'm recording by candlelight. It is always a pleasure to be able to bring this show to you. If you did enjoy this episode or some of Mike's magic from the last few weeks, please do throw some stars and a kind review on your platform of choice. It gives us a little motivational bump, but much more importantly helps others to find this show as well. Thanks again, and until next time, take care of yourself and those around you.

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