# Why battery storage procurement is still a chaotic, challenging endeavour in the US



**Procurement** | Battery storage deployments, both with and without solar, have been in a new growth phase that has smashed quarterly records consistently while costs have continued to fall. Nonetheless, the maturity of the industry is not always reflected in the information available to financial decision-makers, writes Adam Walters from Stoel Rives LLP.

Seasoned renewable energy lawyer Adam Walters from Stoel Rives argues that procurement in the battery storage space is currently like a sort of Wild West. Here, Walters describes some of the finance risks that face this maturing industry around procurement issues.

Ensuring supply chain robustness, ensuring customers understand the warranties and performance claims they are getting from manufacturers as well as navigating the patchwork nature of market opportunities are among the significant challenges he sees in the market today, particularly in the US.

I got into utility-scale solar back in 2008, when it was just kicking off in the US. And then I moved on to Asia and kicked it off in Australia a few years after that. What you saw with PV, of course, is how rapidly it came down the cost curve for CapEx and ultimately became commoditised. You had the big shake up in around 2011 in solar PV, with the Chinese coming in with incentives for their manufacturing industry and essentially blowing out of the water, the European and American manufacturers.

There were very few survivors of that. We're not seeing that in battery storage, but what we are seeing is the rapid decline down the cost curve that is very similar to solar. It hasn't been quite as exponential as solar has so far, for battery storage. It certainly came down like that, and then it's somewhat flattened out over the last two or three years. Perhaps that's because you don't have the same glut of supply as was seen in PV in 2011, 2012.

The other big difference is where the players started out. You really saw in batteries, the Koreans, Samsung SDI and LG Chem, being the early leaders along There's been some standardisation across the industry in areas like round trip efficiency but battery procurement is in many ways still like the Wild West: chaotic.

> with Panasonic to a lesser extent. So Asia was already a leader for batteries. Once we started to see the stationary storage industry take off, the Chinese didn't catch up quite as quickly.

Tesla's kind of a whole different animal altogether in being an auto manufacturer that designs its own cells and jumped into that space along with Panasonic. In the last two years, you're starting to see the Chinese manufacturers really start to take over, but I just don't expect to see that kind of dominance that we saw with PV.

We are going to see a more balanced market where you have different players in different parts of the world, with Europeans and North Americans still being competitive. And part of that is the technology is different. I don't think battery systems are going to get commoditised as easily as solar panels.

A lot of it is in the energy management system, or the battery controller, where you're talking about firmware, operating battery systems and optimising for market conditions, PPA, temperature, climatic conditions, and all of that. It's a more complex bit of technology than solar PV was, so I think we're not going to see prices crash as quickly and we're also not going to see one country completely dominate.

## Batteries for life, or for the lifetime of the batteries

You have something that does something very simple. It stores energy, it sits idle, and then it discharges energy, that's all it does, just those three things. But it's how, and when, those three things occur that determine the value of the battery system. The other real key thing and key difference between this and PV is that availability is a critical part of the value of a battery system.

Whereas with solar PV, once you've got the PV system commissioned and operating, it's going to sit out there and just generate electricity more or less for 20 years, and up to 35 years. Of course, you have to change out the inverters and other components eventually, but it's just going to keep doing that.

Whereas a battery system, you have more complexity in the hardware and the use case and how the battery is used is going to determine the life of the battery and when components need to be replaced. So availability is just a much more critical part of the ownership and operation of a battery than it is a solar system where you might have availability guarantees, but it's not a high risk, it's not something you worry terribly about and it's also not something that you're going to get heavily 'dinged' on in your PPA. Because those are mostly energy-only contracts.

There's a difficulty in financing standalone energy storage projects right now in a lot of markets, because you may not have a long-term off-take contract, or a 20-year power purchase agreement, for instance.

In some countries, or markets, you might have a robust enough ancillary services market where you can model it based upon capacity that's online and maybe get financiers comfortable with the revenues that you're going to be able to



South Korea's Samsung SDI and LG Chem were the early leaders of the industry.

generate from that, in addition to revenues from energy arbitrage. But unless you can find somebody that's going to give you a long-term capacity contract for standalone storage, right now that's the real difficulty - how do you finance it?

A lot of our clients are independent power producers (IPPs), and they're doing solar-plus-storage. There you have an easier case, because for the most part they're choosing DC-coupled battery systems and so really what they're just doing is maximising the energy uptake from the combined system. So you don't have the financing issues as much.

There's a lot of financeability issues with the product offerings, though. What I emphasise for my clients who are looking to procure battery systems or energy storage systems, is that you're not focusing on the engineering, procurement, construction (EPC) partner nearly as much.

You're focusing much more on the technology, on the long-term service contracts, the availability guarantees, the energy retention guarantees that you're getting from the battery integrator or OEM. You have to make sure that you're going to have somebody standing behind that battery system, in the long-term for the lifespan of the battery, which in most cases is going to be 15 years without battery

augmentation. You have to emphasise those warranties and guarantees, and long-term service contracts.

## Augmenting: the reality

My main point when I'm advising clients, is to think through these issues upfront and when you're initially putting out your RFP to tender to determine exactly what you want, and what you think your financing parties are going to require.

Augmentation is another big point. You usually have a standard availability guarantee that's long-term and then an optional battery augmentation contract, which is really CapEx. What financiers are used to seeing is basically, 'Well, this is a power plant that's going to operate for X number of years at X power capacity'. They're less used to this idea, that you're going to have a bunch of CapEx already in year six or year seven, or the energy capacity is substantially degraded by that point.

So there's different ways to do it. You can do it as an upfront CapEx contract, l've seen some suppliers do it that way. Or you do it through the long-term service agreement (LTSA) as part of that contract, and then that's built into the annual maintenance fee.

A lot of it just depends on who the end user is, and what their preference is. Do

they want to try to finance 100% of the CapEx of an augmented battery upfront? Or do they want to try to do it as OpEx over the course of 20 years? Or do they want to just take a punt on it and decide to just take the standard OEM energy retention guarantee and see what the revenue situation and use case of the battery looks like and five years down the road decide whether to engage someone to augment the battery. You're going to pay more to do it that way down the road in some cases, because the original system hasn't been designed for that, but we're seeing different ways, and all of those ways can be successful.

### It's like the Wild West out there

The battery storage procurement space is still a kind of Wild West and I don't see it becoming any less chaotic just yet. However there are some things that are starting to coalesce, in terms of standard offerings. Round trip efficiency is a good example.

The Korean manufacturers initially came out with fully integrated offerings, which really had more to do with the way that the construction industry in Korea works and how it's regulated than anything else. You have to have a different company for every aspect of the value chain under their labour and construction laws, and so you don't have full turnkey types of contracts, like you typically do in the West.

These big conglomerates, they have their electrical contractor affiliates, they also have their construction affiliate, their high voltage affiliate and their battery manufacturing facilities affiliate, so they can actually cover everything. They do it through multiple contracts, that all flow upward to the parent company.

The Koreans really started the trend with round trip efficiency. Back three to five years ago, nobody else offered round trip efficiency guarantees at all. Then we started seeing those kinds of requests from utilities. This was coming from your Samsungs and LG Chems, because they were fully wrapping, providing 10-year warranties and full wraps where you just can't get that from an EPC contractor, for instance, in North America or Europe.

Nowadays, it's pretty rare to see a battery contract that doesn't have round trip efficiency guarantees that run usually the same duration as the energy retention warranty. So they're going to warrant round trip efficiency over 10 years or, typically sometimes 15 years, just like they warrant energy retention. So we're seeing that whereas, just maybe three years ago, you didn't. So there are some kinds of things that are starting to become more standardised.

## OEM technology risk remains

What concerns me as chaotic really relates to the OEM technology risk. Outside of a couple of exceptions, most of the battery cell manufacturing capacity is in China, and you have these Chinese manufacturers, and you have really no idea — at least I don't as a lawyer — how bankable these are.

Where are their materials coming from? Those kinds of questions. And their warranties are kind of all over the place. The way they tend to do their warranties is to leave lots and lots of blanks and so if you're just looking at a form warranty, unlike a Western company, which is going to say, "Here's our standard warranty, and here's our extended warranty, and these are the offerings," — they leave all this stuff blank, and it's open for negotiation.

You have to trust the battery integrator to make sure that the battery integrator negotiates the kind of warranties with the OEM that you expect and that you want. We see a lot of battery integrators that are pretty squirrelly about that stuff, they're not telling the developers or their purchasers: "This is exactly what you're getting from the OEM and the warranty that we're going to assign to you".

Or they're not even trying to assign that warranty to the owners, and the smaller projects. Whereas with large utility-scale, you're going to demand a full wrap and for a number of years, and then you're going to demand assignment of that OEM warranty and you're going to approve that warranty upfront.

This is where I'm seeing a lot of craziness in a market where some developers are signing up battery integrators, and they're thinking, "Oh, it's a small battery and I care more about my solar plant, it's only a few million dollars of CapEx or whatever".

The agreements are just really sloppy when they get to me and I look at them. They don't have the kind of performance testing that you would normally see from the top tiers. They've signed up a battery integrator without even knowing really what the OEM warranties are that they're getting.

## Stand by your plan

Battery integrators have to stand behind

the technology that they're procuring for the battery system for that period of time in order to get the deal. One thing that alarms me a little bit with battery systems is a trend in procurement strategy that I think started with the big utilities.

Rather than procuring through turnkey contracts, they don't want a bunch of margin stacking, driving up their project costs. So they started to procure the major equipment themselves. It started with inverters, probably 10 years ago. You had developers say, "Okay, we're just going to start procuring our own inverters," and then moved on to other things, trackers, racking, solar PV modules, all of that kind of stuff.

With batteries, they just kind of extended that straightaway, without adding a period of time where they said, "We want to see turnkey contracts. We're going to continue with our standard procurement methods".

And there is definitely some concern in the market about procuring battery capacity for their larger battery storage projects in the next three years. There are legitimate reasons to do that beyond avoidance of margin stacking, but the result of that is, you've got a bunch of split contracts and you're increasing your interface risk, and you're increasing all kinds of other risks in the construction and procurement stage of the project.

In some markets, the project finance is still very, very conservative and would not allow what we see in the US. When you have a new technology, like battery systems, I think there's going to be a lot of projects that run into availability issues if you have something going wrong with the different components in battery systems.

You're going to have situations where you've got nobody standing behind that and it might take months to procure the spare parts that you need. You're left as an owner dealing with two or three different parties, and they're all finger-pointing.

As a lawyer, that's my biggest concern: how do you mitigate all of those risks?

#### Authors

Adam Walters is a transactional, commercial and project lawyer specialising in offering legal counsel to clients across a range of industries including wind, solar PV, telecoms, manufacturing, water and of course, energy storage. Having spent 10 years as



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