

Infrastructure – Risk Perspectives

Episode 3

Battery storage and the infrastructure investment sector

Martin Bennett: Hello and welcome to our audiocast today. This is a session where we are going to focus as a Marsh team on battery energy storage systems.

My name is Martin Bennett and I lead Marsh's advisory services across the infrastructure and energy sectors. Really delighted to be joined today by a number of Marsh colleagues sitting across both our renewable power group, and also our M&A team to give perspectives on the sector.

I'm joined today by colleagues Darren Popham, Chris Taylor, Sabbir Khandokar and Tom Burrell. So welcome to you all and thanks for joining this conversation today.

We're going to talk through a number of topics. We're going to look at some of the key risk issues, the insurance market, some of the challenges and advantages of taking a risk engineered approach to looking at battery energy storage system projects and then the lender perspective as well where this is effectively external debt put into a project. So welcome everybody and really looking forward to the conversation over the next 10 minutes or so.

Perhaps just to start off with, if we think of some of the risk issues. You know, battery storage is clearly growing at a significant pace in the UK, across continental Europe and on a global basis. So if we just look at this from a risk perspective, what are the early stage issues we are starting to see and Tom your thoughts on this please?

Tom Burrell: Yeah thanks Martin, and good to talk to this. So many of the projects we have seen so far are in pre-development or indeed construction phase. The range of risks and issues that go across all phases of a project, the most obvious obviously relates to asset damage and the resulting impact on revenue streams, Chris will talk more from an engineering point of view around fire and how risk engineering has a role to play in that. Where we look at construction phase risk, naturally contractual risk management is a key consideration, that also goes down to the asset management and the roles and responsibilities where third party O&M providers are involved.

Some of the other issues we've seen of note relate to title, use of land, also environmental liability is prompting some questions particularly where you are again using ex-industrial or disused land. There's also some interesting longer term questions around the operational performance of batteries after a number of years and ultimately decommissioning risks associated with batteries is something that we're

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maybe not seeing so much of now but certainly will be in the future I expect. But the fire bit is probably the one that really stands out Martin and will a focus of our discussion today I think.

Martin Bennett: Okay that's super Tom and thank you for those insights. And as I said, we will talk to Chris about fire risk and broader risk engineering issues in a bit more detail later on but I'd like to just take just a little bit of a focus on the insurance market. Anecdotally we know talking to a lot of our clients, whether they're investors, owners, operators that the insurance market is challenging for these projects. Darren, can you just give us your perspective, your thoughts on where the insurance market is in terms of maturity for battery energy storage system projects, some of the key challenges and issues we need to navigate here?

Darren Popham: Thanks Martin, the market at the moment is still very immature on battery projects. There's still new technology coming to market which clearly is raising concerns with insurers and actually a limited pool of insurers that would consider themselves as being lead markets for these types of projects. There's maybe a handful of underwriters that would be considered to be a real recognised lead market.

So coupling that with the general hard market that we are currently in, it actually does mean that we need to make sure that any battery project we are putting into the insurance market is done well. The underwriting information provided is detailed and very much a risk engineering approach is required. Not just for the construction phase but also looking longer term, ensuring we can secure good, competitive terms for the operational phase as well.

Martin Bennett: Okay that's super, in terms of the insurance market and perhaps sort of underwriting capacity as these projects get bigger, you know a more industrial scale rather than perhaps the micro projects we saw a few years ago. Any issues with that Darren?

Darren Popham: I think if we were to look generally at the renewables market over the last 20 years there were a number of key players in this space. The main change we've seen over the last 5 years is the amount of capacity each insurer will put to a risk and for the reasons that Chris I'm sure will go onto explain and the first risk associated with these projects, insurers are typically looking to limit their capacity and maybe only writing 20/25% of their individual project which means we've got to find a number of supporting insurers to actually complete the placements so that does make it more challenging but a challenge that we can rise to certainly.

Martin Bennett: Okay that's super Darren. So look Chris we've been talking and skirting round the issue of fire and insurers and concerns around battery energy storage projects. Can you give us a few of your more technical insights as a risk engineer? One, you know why do these projects catch fire, why are insurers so scared about them? And two, what can an owner do in terms of adopting a more risk engineered approach to projects at an early stage but also through the development, through the operational piece to make sure they are as well engineered as they can be and they're actually going to be as insurable as they possibly can be as well?

Chris Taylor: So battery energy fire normally starts with battery abuse which can happen in a number of ways, mainly thermal, electrical and mechanical abuse is predominantly the batteries operating outside

of their design parameters. This itself given the insurers concern, relates to the modular design can mean that mechanical breakdown isn't the most dominant factor but whereas a cascading fire event can effect multiple assets on the site and it then becomes an insurable interest from a cascading event.

Martin Bennett: What can the owners do from a risk engineering approach?

Chris Taylor: So looking at a holistic approach to the fire itself and the design, so looking at the separation between modules, the batteries themselves and any invertors or transformers or any adjacent equipment so looking at the design and separation and then looking at some of the processes that are in place such as having the battery management system integrated into the fire detection and gas detection systems and as well as the fire suppression systems that are in place.

Martin Bennett: Chris, you've mentioned quite a few technical comments and technical phrases, can I take you back to an earlier point – what is thermal runaway?

Chris Taylor: Well thermal runaway it starts with battery abuse, as mentioned earlier, and in a number of ways which is essentially the batteries operating outside of their design parameters. This battery abuse can lead to off-gassing, which can in itself be an explosion hazard and can then also lead onto thermal runaway which is basically where the thermal runaway can then cascade through from cells to cells to adjacent modules and ultimately resulting in another fire and explosion event. And this can then cascade through a battery energy storage system from the modules themselves or can also incorporate the adjacent assets such as the invertors or the transformers.

Martin Bennett: So what developments, Chris, are you seeing on battery technology projects to make the risks more insurable both at a construction phase but also very importantly for the long term operational phase of a project?

Chris Taylor: We are seeing the next generation of battery energy storage units coming to the market which are looking at more of a tubular modular design from the previous containerised designs that we have seen previously. These are coming up with newer features such as blast and exposure protections that have been put in place. We are seeing battery management systems that are integrated at both the fire detection and suppression level. We're also seeing in terms of advancements from the standards point of view over the last couple of years from a number of bodies. A lot of which are pointing at some of the separations that are in place and some of the accreditations of looking at certain standards and how the batteries respond under fire conditions. So Darren, does this give you an advantage in terms of the placement side?

Darren Popham: I think Martin one of the advantages of the points Chris has raised is that with the better separation on the risk you are hopefully enabling insurers to release more capacity to each project which then will hopefully drive more competition and potentially a better insurance solution as well.

Martin Bennett: Okay, no that makes absolute sense. I would like to bring Sabbir in now. We talked at the beginning about the fact this is a sector where there is lender involvement. I think it's fair to say that there are not that many projects that we as a team have seen so far where there's been commercial debt

raised at a project level, or at project finance structure, but Sabbir give us your considerations really from a lenders insurance advisory perspective please?

Sabbir Khandokar: Yes Martin thank you. So you are right in saying we haven't seen many battery energy storage system projects involving project finance and one of the reasons for this is because of the uncertainty around the revenue streams. You know, for project finance transactions it's a very very important requirement. But talking to our lender client base what we have discerned is that the ongoing evolution of this sector we are likely to see increased numbers of projects involving project finance in the coming years. And one of the things, well a few of the things that is making it more attractive is the improvements in technology allowing costs of financing these transactions as well.

But from an insurance perspective what remains clear is that the expectation from the lenders side would be for the project to maintain project specific insurance programme over the life of the loan. That would include having lenders named as insured, including the usual lenders clauses and the assignment of those insurances, and securing letters of undertaking from the broker responsible for placing the insurance programme for the project.

Martin Bennett: Okay, Sabbir thank you. That makes absolute sense and again a nice track through for the point as more project finance debt comes into either existing or future projects.

So with that I'd like to wrap up today's session. Thank you all for your perspectives, your insights. Think we've got some really valuable thoughts shared during the conversation.

Thank you very much for listening to our audiocast today. There will be further audiocasts to follow in this series.