

INTERVIEW: Graham Hoare, President, Global Operations, Britishvolt

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Amit Panday

S&P Global

Supply Chain and Technology, Automotive

Britishvolt's UK Gigafactory project will need about USD5.14 billion in funding as the startup is open to the idea of private as well as public funding routes

Graham Hoare, who joined Britishvolt last year as President of Global Operations, spoke to IHS Markit about the young EV battery technology and advanced cell manufacturing company's journey so far including, funding goals, the UK's conducive EV ecosystem, scale up of pilot production to capacity expansion of the proposed Gigaplant, potential partnerships with vehicle manufacturers, sustainability, and carbon emissions. Edited excerpts below:



Q: Many congratulations on closing the latest round of funding that included GBP1.7 billion (USD2.3 billion) from Tritax and Abrdn and GBP100 million under the Automotive Transformation Fund from the government. What is the importance of raising these funds in setting up the planned 30-GWh factory at Northumberland and other global projects?

Started in 2020, Britishvolt is a relatively young company in its development stage. We are able to accelerate at pace because of the conducive ecosystem that exists in the United Kingdom. This ecosystem was formed between the UK auto industry and the UK government over the last four or five years. The advantage it offers is that there are a lot of capabilities that are needed in the early stage of a battery company. So that means that we were able to develop a battery about 18 months faster than what would have been without this ecosystem. More importantly, we did not have to finance those assets ourselves. We could leverage the likes of UKBIC and WMG, so our cash burn was really directed at the product and the acquisition of this prime real estate in the North-East UK.

The Gigafactory project in the UK will need about GBP3.8 billion of funding, including the land acquisition, infrastructure, the energy for the factory and the machine tools. So, we really got to the right point in the project where we got the definition of the program, we got the clarity of the product specification, the A-sample has literally come out of system on target, and it is the right time to finance the plant.

On the government trigger, the confidence that they built enabled some of the key financing activities, including the Abrdn project. It was a major injection in the arm as the deal effectively buys all of the shell and core and energy and infrastructure provision for not only our site but also the adjacent supplier parts. So, they with Britishvolt are trying to localize the key suppliers to the battery world, not only for us but also all of the UK.

Q: Do you expect to continue raising funds privately or do you intend to go public?

We will continue to attract the right level of private capital over the coming months as that would enable us to continue the business and see our products and technologies through the maturity, machine tools and construction. Furthermore, there is clearly an ambition to make the company public. We plan to do that for a number of reasons—financing is one, but probably more importantly we would like to be transparent about the operations. The sustainability credentials of the company can be used as a benchmark. So, I think the aspiration to go for listing on the London stock exchange is strong, and it is very much in our plans. That said, we have not decided on the timing for public listing. For now, we believe that the market might evolve and if we can get access to high

quality finance from the private market, this will allow us to be more strategic in our plans to go public.

On public listing, we will decide this calendar year or next, following further strategic review.

Q: The Advanced Propulsion Center (APC) has projected that the UK will need 90GWh in battery capacity by 2030. Considering the existing plans by Britishvolt at Blyth and Envision AESC at Sunderland, we notice a large gap. Do you believe there is a potential to expand beyond the announced 30 GWh?

We've spent time looking at the building and our production plants and with a series of optimizations we've made in the process equipment, we have been able to increase our final production capacity to 38 GWh, which is a big step forward. We think this would be delivered in four key phases. The original plan was to have 10 GWh per phase in three phases. But now we plan to expand capacity in four phases that will allow us to be nimbler to the format and the chemistry that is going to evolve over the time.

I think 38 GWh is a very strong proposition in the UK, it's about 300,000 vehicle equivalents, which would be about 20% of the entire auto industry. I agree with APC's hypothesis that we need about 90 GWh and there is space for others to consider the UK. I think UK is a great place for the ecosystem and the partnership with the government on creating the right environment for a gigafactory.

We will start mass production in the second half of 2024. Mass production is effectively when we are selling the product, after the cells are qualified and, C and D samples are provided to the customers and are validated. We are confident about that timing. We are also confident of the increase in the volume of the plant as we go by adding the phases and also ramping up in the volume and building the fourth largest buildings in the UK.

To ensure that the facility starts on time, we want to scale up the business first, we want to build the machines that are very similar to our main production lines that allow us to qualify our samples and also to ensure our customers as they require samples in the development phases. These capabilities are very important to support our customers and have our products qualified.

Q: It has been frequently stated that BV has global aspirations and Canada has been named as the potential location for the second Gigafactory. Could you please elaborate on the reason for this choice and whether there are plans for other countries?

Canada is a great opportunity for us, North America is the next major market after Europe, but it is slightly behind when compared to Europe. Canada offers unique advantages. It's very similar to our activities in the UK in many ways, good reserves of clean energy, in the case of Quebec an efficient hydro system exists, and very affordable renewable energy as well. So, it's very supportive of cost-effective manufacturing. The raw materials that exist in Canada and relatively cost-effective labor will be our advantage. The Canada project may come up about 12–18 months after the project in the UK, as we are currently looking at site acquisition and environmental permitting. The capacity that we are planning will be about 60 GWh. In this program we are having close discussions with the Canadian government, which have strong aspirations to have low carbon, sustainable battery manufacturing in the region.

There's a strong opportunity for battery energy storage systems (BESS) or static energy storage across the Middle East and Africa. We think the static storage in terms of the scale of the business is going to be slower than vehicles manufacturing. At the end of the decade, the volume will increase significantly and there are a lot of activities in the Middle East and Africa to support that. We are

considering our developments in those regions. Based on this direction, some of the technologies of our batteries are directly compatible with static energy storage and therefore we see a pathway from what we do in the automotive to have high quality sustainable battery for static energy too.

In case of other regions, we are engaging with our customers on their footprints and what they require, we would indicate flexibility installing of our blueprint factory model in any location in the world that it makes sound economic sense.

Q: In the automotive industry, we see a trend towards the formation of the partnerships between the cell makers and OEMs. Do you pursue a similar strategy for the future? Are you going to focus only on the UK market or also have an eye on continental Europe? What will be the challenges for this?

We are in proactive discussion with 29 OEMs. While our competitors are targeting volume markets for EVs, we are looking at two segments to fine-tune our business—one is sports cars and the other is the sport derivative of main stream models such as the BMW M sport brand. To be clear, I am not suggesting that we are in a relationship with any OEM but we are going to target that high-end category, and then trickle down the technology to affordable mass-adoption.

The other sector that is important and has unique challenges is the commercial vehicles sector. A lot of research and development (R&D) is related to those two sectors, which we think are under served and have challenges that we think we can help with. The way that we are working is to make tailored and customized products that ultimately allow those companies to realize the maximum potential of that technology. In terms of the way that model plays out and the way of partnering, what we are going to do is to make sure that people who are investing in the company with us have some strategic relevance. So, for example we have a strong relationship with Glencore, one of the world's largest diversified natural resource companies and the largest supplier of responsibly-sourced cobalt. They had a real interest in helping us with the supply chain. The way we try to work is to look for the partnerships that makes more sense to de-risk the battery proposition.

Similarly, on the OEM side, we are actively engaged in the dialogue with many of them. We do not want to be prescriptive about what it should look like, it could be part of the vertical integration pathway, it could be a joint venture, when we work actively together to codevelop a portfolio of products wherein the batteries are ultimately manufactured by Britishvolt.

So, all those options are on the table and in the discussions with 29 OEMs and we effectively see what fits for them, and what we do know is that the one size battery formula does not fit for all. So, being adaptive is our approach and I am very pleased to say that has worked very well for us and we are building a very strong customer base now and the models are all slightly different.

I am delighted to share that we are working with Lotus. It is an extremely professional and competent team who are at the top of their game and to partner with them to make market leading next generation battery cells, and the best sport car platform concept, is a great opportunity.

Q: What types of cathode chemistry seems to be suitable for Britishvolt's target market?

High nickel manganese cobalt (NMC) is very important for the high energy applications. Our first customers are expected to use this technology. We are also looking at the lithium iron phosphate (LFP) chemistry and some evolutions of it.

Q: Though it seems that your primary customer target is within the light passenger vehicle EV market, do you wish to enter other markets such as stationary storage,

medium and heavy vehicles or marine? Is your cell technology suitable? What will be the targeted share between EV and energy storage systems (ESS)?

In the short terms, the primary focus is on the auto industry. The technologies that are being developed for the auto industry can be used for other applications in the future, for example the high power NMC cells that are being developed for the sport cars are potentially also suitable for electric aircraft application. The chemistries for the commercial vehicles are similar to those needed in the BESS field where extended charge and discharge and durability is required. Britishvolt is also considering expansion in the Middle East and Africa for the BESS application.

Q: We are happy to hear the successful development of the design-intent cell with collaboration with UKBIC. What do you believe are Britishvolt's strengths that make it competitive with the industry's incumbents from a technical or commercial standpoint?

In terms of partnership for development, we are working closely with Faraday institute, which is the body that has united the UK ecosystem around the battery development, which includes Warwick manufacturing group, Oxford University Imperial College, among other organizations. That team has been instrumental and has been helping us as we grow our capabilities. On the ground, WMG's battery lab has been instrumental in making the early coin samples and formulations. The same for UKBIC, which has been used to scale that capability up to the thousands of cells. These are the volumes that are necessary for our testing and give samples to our customers later in 2022. The advantage of those groups is that both are very competent, but at the same time they provide an intellectual property neutral system where we can develop our own IPs for next-gen battery cell deployment.

A key strength of the UK in this space is the modeling capability. What we have been out to do with Faraday Institution is leverage some early work that was developed in the consortium of universities on the modeling processes on thermal cycling and degradation. To use those models to make a new way of designing and developing cells that's been extremely powerful for us. What that means is that we've been able to significantly accelerate development of our bespoke cells and demonstrate to our customers how minor changes in the geometry and chemistry can radically change the outcome of the product.

In commercial terms, the great advantage of working in the UK is the Gigaplant site in Northumberland. The former coal-stocking yard was chosen after a huge amount of due diligence of sites that we considered across the UK. The Northumberland site, located in Cambois near Blyth, has access to billions of liters of water, has adjacent infrastructure and a deep-sea port as well as huge volumes of readily available sustainable energy coming from Norwegian Hydro (North Sea Interconnector) but also from wind farms off the coast of UK. There also is a tremendous workforce in this area. We are working with the local community to make sure that they will have right skills when the site opens. We have a golden opportunity to make the fundamentals of the business right and produce cost-effective batteries.

Q: While you say sustainability is clearly placed at the core of the Britishvolt's strategy, can you quantify the importance of this factor in your business model? What are the driving forces that could potentially lead OEMs to use more sustainable batteries? And what are your solutions to provide a more sustainable and socially responsible battery?

Most of the gigafactories that operate around the world, particularly in China work on coal-based power. In Europe, it is a combination of coal and gas, but actually these are not the cleanest sources of energy if you want to deliver a net-zero future. We have a golden opportunity at Britishvolt

because we are at the start of the next industrial revolution to be fully green right from the beginning. Our upcoming gigaplant will be the first in the world to be fully electric and not using gas. Those decisions must be really embedded in the culture as the business. We not only are delivering on the sustainability promise but also measuring it to be able to demonstrate that credibly to our partners as well.

In the past, car industry sustainability was not a strategic priority. But now we are seeing a change with the millennials now becoming more influential, their conscience for the planet and sustainability is higher. So, I certainly see that the buying behavior is starting to change. By the mid-decade the sources of the key product and carbon dioxide (CO₂) emitted during the manufacturing process is going to be profiled in the consumer's decisions. In this context too, we are setting ourselves to be both cost effective and deliver those sustainability credentials from day one.

Q: Do you think the proposal by the European Commission for setting thresholds for the carbon footprint of the battery production would be to your advantage?

Absolutely, I encourage the European Union to take those measures. These changes are difficult for the industry particularly for the incumbents that have footprints that are based on coal and gas. These changes take significant capital investment. So, the government is taking a forthright and strong position on these matters is always helpful. But I do believe this will be the voice of the people that drives that change.

Q: On the raw material carbon footprint, while you mentioned about the sustainability measures at your site, but what about the upstream environmental impact?

We are tracking our CO₂ footprint through several tools, primarily through our partnership with Circular. We are also encouraging our supply chain to do the same, to quantify ESG claims with data. There's tremendous opportunity here, because of the changes in the legislation in 2027 that encourages the localization of the tier-1 and tier-2 and upstream components in the supply chain. We are working with our supply partners on how they can localize because less mileage means less CO₂. A lot of processes in the supply chain are quite very energy intensive. So, there's an opportunity to reduce the carbon footprint. Battery cells out of China have an average carbon footprint of 93 kg CO₂/kWh, eastern Europe on average has 60–62 kg. Our target is not far off from 25 kg CO₂/kWh and we do that with the combination of renewable energy in the plant, shortening the supply chain while pivoting the energy in the supply chain.

Q: There are some concerns regarding the battery raw material supply chain which were amplified last year by the skyrocketing lithium prices. How does Britishvolt intend to secure its supply chain through this turbulent environment?

A lot of supply chain developments are work-in-progress, and we are partnering and selecting our suppliers at the moment. The Glencore deal was very important. That unlocks about 30% of our cobalt requirement. You may ask why not 90%. That's because there's an interesting dynamic in the market, some of our customers have bilateral agreements with the mining and material sourcing. Obviously, we wish to engage as well and there is also the guys with the CAM and preCAM in the middle.

Q: There are stringent regulations regarding the Rule-of-Origin as a result of Brexit. How do you believe these legislations can impact your both supply chain and customer base?

Absolutely. I think cathode active material particularly but also anode manufacturing. These two

components are the most important, so we'll see CAM localized in the European region. That's very important, because it shortens the supply chain and it allows us to pivot partners to renewable energy as well, across the supply chain. This is good for the whole industry, not only Britishvolt.

Image source: Britishvolt

Ali Adim Hafshejani, Senior Technical Research Analyst, Battery, IHS Markit

ali.adim@ihsmarkit.com

CONTACTS

The Americas

+1 877 863 1306

Europe, Middle East & Africa

+44 20 7176 1234

Asia-Pacific

+852 2533 3565

www.spglobal.com/mobility

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