

Ensurge Micropower

Superior replacement in billion-unit market

Ensurge is using its proven printed technology and roll-to-roll (R2R) production facility to make solid-state lithium microbatteries. It is targeting markets where the high energy density, flexible form factor, enhanced cycling and improved safety features offered by its innovative technology should be able to command a premium compared with conventional batteries. The company is currently preparing for an initial production ramp towards the end of FY22.

On the cusp of commercialisation

Ensurge has already signed agreements with five customers that are active in the industrial, digital health, medical hearables and wearables markets. Having demonstrated working microbatteries in H221, the company is preparing to ship samples to these customers 'in the short term' and to start deliveries of microbatteries for commercial use by the digital health customer in Q422. In preparation for this volume ramp-up, Ensurge is adding equipment to its existing R2R facility, which was previously used to manufacture millions of anti-theft tags, so it is optimised for microbattery production.

Losses widen as company prepares for production

EBITDA losses, excluding share-based payments, widened by \$3.3m year-on-year to \$14.6m in FY21. This reflected higher payroll and premises costs as the company got ready for microbattery production. In February 2022, Ensurge completed a private placement and share allocation, raising approximately NOK100m gross (\$11.3m) and issued warrants potentially raising up to NOK100m. Management intends the recent fund-raising programme to provide sufficient funds to give adequate time to demonstrate a series of technology and market development milestones but notes a potential funding gap in Q322.

Valuation: Potential market of over 1bn units a year

Ensurge is initially targeting the medical wearables and hearables markets, followed by the connected sensor and sport & fitness wearables markets. Our scenario analysis calculates that a 5–10% share of these markets represents annual revenues of \$330–550m and EBITDA of \$211–365m. Management has stated that when the R2R factory in San Jose is fully utilised it could potentially generate EBITDA of over \$100m, depending on product mix.

Historical financials

| Year end | Revenue (\$m) | EBITDA (\$m) | PBT* (\$m) | EPS* (\$) | DPS (\$) | P/E (x) | Yield (%) |
|----------|---------------|--------------|------------|-----------|----------|---------|-----------|
| 12/18** | 3.4 | (49.3) | (54.3) | (0.93) | 0.00 | N/A | N/A |
| 12/19** | 1.2 | (30.6) | (35.9) | (0.61) | 0.00 | N/A | N/A |
| 12/20 | 0.5** | (11.3) | (14.9) | (0.04) | 0.00 | N/A | N/A |
| 12/21 | 0.0 | (14.6) | (17.2) | (0.01) | 0.00 | N/A | N/A |

Source: Company accounts. Note: *PBT and EPS are normalised, excluding amortisation of acquired intangibles, exceptional items and share-based payments. **Discontinued business.

Tech hardware & equipment

11 March 2022

Price **NOK0.47**
Market cap **NOK898m**

Share price graph



Share details

Code ENSU
Listings OSLO, OTCQB
Shares in issue (before nine-for-one share consolidation) 1,914.2m
Net debt (\$m) at end December 2021 (excluding \$1.6m restricted cash and \$10.9m finance leases and funds from February \$11.3m placing) 4.5

Business description

Ensurge Micropower's solid-state lithium battery technology combines advanced energy cell design with proprietary materials and manufacturing innovation to produce thin, flexible batteries that can power safer and more capable wearable devices and connected sensors.

Bull

- The high energy density, flexible form factor, enhanced cycling and improved safety features of solid-state batteries are highly suitable for the hearables and medical wearables markets.
- Markets for microbatteries already established.
- Ensurge already has volume manufacturing facility able to generate c \$100m EBITDA.

Bear

- Ensurge has yet to generate meaningful revenues from microbattery sales.
- Revenue growth dependent on companies incorporating microbatteries in their products.
- Management has identified a potential funding gap in Q322.

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Ensurge Micropower is a research client of Edison Investment Research Limited

Company description: Innovative solid-state lithium battery technology

Ensurge Micropower was reborn in January 2020 when management announced that, going forwards, it would use its R2R assets and printed electronics IP to develop and manufacture miniature solid-state lithium batteries. This proven ability to print electronic components on a flexible steel substrate means that Ensurge can offer microbatteries that offer superior performance to conventional lithium-ion rechargeable batteries, thus commanding a premium price. Importantly, since Ensurge's solid-state format is offered as a replacement for conventional coin and button batteries in hearing aids as well as addressing emerging markets such as connected sensors and sports wearables, the demand is already there, so the company does not need to build up the market itself. Management estimates that the addressable microbatteries market is over 1bn units per year and has previously noted that it would be possible for the company to have a cash-generative, profitable business on around 4m units per year, which is a very modest share of the addressable market.

Ensurge Micropower has already signed agreements with five customers. These include a Fortune 500 industrial company active in manufacturing capital equipment, a customer in the digital health market, two agreements in the medical hearables market and one in the broader wearables market. Although management had intended to ship the first samples by the end of FY21, this milestone has slipped, contributing to a share price reduction from NOK0.75 at the start of January. The company now intends to ship samples to these customers 'in the short-term' and to commence deliveries of microbatteries for commercial use by the digital health customer in Q422.

Ensurge differs from many early-stage technology companies in already having a volume manufacturing facility, which it has used to make other printed electronics components. Prior to the decision in January 2020 to develop printed microbatteries, previous management had installed an R2R production line in San Jose. This had output several million electronic article surveillance (EAS) tags and was preparing to commence production of more complex near field communication (NFC) tags before it was mothballed in early 2019 when it was clear that adoption of NFC tags by brand owners for brand protection and marketing purposes was not going to take off as quickly as initial customer wins had indicated.

The company's corporate headquarters are in Oslo, Norway, and its global headquarters are at its high-capacity flexible electronics manufacturing site in San Jose, California. The company's shares were admitted to listing at the Oslo Axess in January 2008 and to the Oslo Børs in February 2015. Its American depository receipts (ADRs) commenced trading in the US on the OTCQX market in March 2015. This US listing was transferred to the OTCQB Venture Market in June 2020.

Market overview

Advantages of solid-state lithium batteries

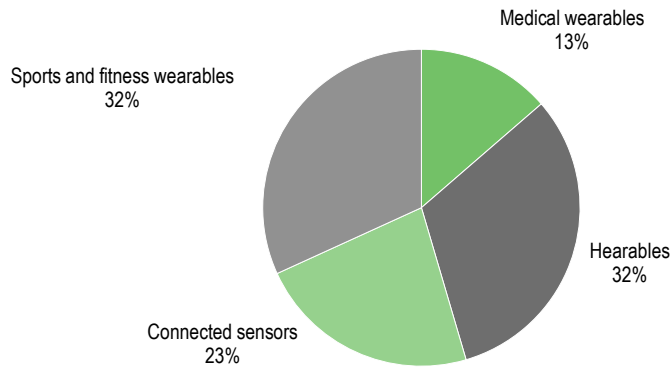
Lithium-ion battery technology has become increasingly popular because of its relatively high energy density. This means that a conventional lithium-ion battery can be half the size of a nickel cadmium battery and still store the same amount of charge. A solid-state lithium battery goes further, storing around double the charge of a conventional lithium-ion battery. This improvement is achieved by replacing the liquid or polymer gel electrolyte of a conventional lithium-ion battery with a solid material, usually either a ceramic or a solid polymer, although sulphides and glass are also used. Solid-state batteries also charge at twice the speed of conventional lithium-ion batteries, retain the charge for longer and last for two to three times the number of charge/discharge cycles. All of these factors are desirable when choosing batteries for use in applications such as wearables

and sensors where minimising size and weight as well as maximising battery longevity are important. Critically for applications where batteries are close to the body, eliminating the liquid electrolyte, which is highly flammable, makes batteries safer. In addition, since all the parts are solid, the resultant batteries can also be produced in unconventional formats such as wires, ribbons or flexible patches, which gives designers of wearable devices the flexibility to create products that are more comfortable to wear. This contrasts with conventional lithium-ion batteries, where products have to be designed around existing coin or button format battery cells. From Ensurge’s point-of-view, the ability to offer customised formats also improves customer retention.

Billion-unit end market

Management expects that Ensurge’s R2R manufacturing technique would enable it to offer solid-state lithium microbatteries at a price that is similar to conventional lithium-ion batteries if required. However, it is focusing initially on those sectors where the high energy density and thin form factor enabled by the technology are most sought after and can command premium pricing, thus maximising the EBITDA potential of the existing manufacturing capacity.

Exhibit 1: Microbatteries market in 2025 (1.3bn units)



Source: Ensurge estimates based on sources including IDTechEx

Ensurge is concentrating on the medical wearables and hearables markets to start with, followed by the connected sensors and sports wearables markets, which are at an earlier stage of evolution. All four markets require microbatteries capable of holding between 1–70 milliwatt hours (mWh) of energy and having a volumetric energy density of 600–1,000Wh/litre. This is achievable using Ensurge’s existing chemistry. Referencing research from IDTechEx, management notes that these markets are predicted to grow to over 1bn batteries per year by 2025.

Hearables (addressable market of 560m units/year): this application includes hearing aids and wireless earbuds. Hearing aids are transitioning from 15–25mAh capacity non-rechargeable batteries to conventional lithium-ion batteries, which are rechargeable. However, conventional rechargeable batteries only last through 300–400 charge/discharge cycles, which is around a year if the battery is recharged overnight while the wearer is asleep. In contrast, a solid-state lithium battery will last for over 1,000 charge/discharge cycles, or around three to four years. Once the rechargeable battery reaches its cycle limit, typically the user has to send the hearing aid to the supplier to have the battery replaced, the cost of which may be covered by the supplier as part of the service warranty. Using a solid-state microbattery instead of a conventional lithium-ion battery potentially saves on service costs, supporting the payment of a premium for the solid-state option. The energy density and number of recharge cycles becomes even more important for smaller format invisible-in-the-canal and in-the-canal hearing aids. Wireless earbuds require cells of 40–70mAh capacity and already use rechargeable batteries.

Medical wearables (addressable market of 150m units/year): this application includes continuous glucose monitors, cardiac monitors, temperature monitors, physiological monitors, glaucoma detectors and motion sensors. Here patient comfort is a priority so replacing a coin (3.2 millimetres

(mm) thick) or button (4.6mm thick) cell with a device that is not only half the volume but also available as a thin (0.05–0.5mm) patch that conforms to the shape of the body or the eyeball or is in the form of a ring is a significant advantage. Eliminating concerns about a battery in close proximity to the body bursting into flames is also critical. In addition, given the relative longevity of solid-state lithium batteries, substituting a conventional lithium-ion battery with a solid-state one means that the total cost of batteries over the lifetime of the wearable is likely to be reduced. In December 2021 MarketsandMarkets published a report predicting that the global wearable healthcare market would grow from \$16.2bn in 2021 to \$30.1bn by 2026, a CAGR of 13.2%. The market was already showing significant growth prior to the coronavirus pandemic because of a combination of a rising geriatric population, the increasing prevalence of chronic diseases such as diabetes and the availability of advanced medical devices including wearable medical devices that have enabled the delivery of quality care in non-hospital settings. The coronavirus pandemic has accelerated the use of medical wearables because data from wearable devices can be used to alert users when changes in their metrics match those associated with COVID-19 or other diseases. The use of artificial intelligence (AI) to analyse data from wearable medical devices and the growing availability of 5G networks to transmit large quantities of data in real-time are likely to support further demand growth.

Sports and fitness wearables (addressable market of 350m units/year): this application includes small electronic devices for activity measurement and smart apparel that can carry out a wide range of functions such as monitoring vital signs or sleep patterns, regulating body temperature, checking whether an athlete's muscles are being overworked during training or disguising a personal alarm. Comfort is possibly even more important here than in the medical wearables markets, since wearing the monitor is discretionary. A report from Data Bridge Market Research published in September 2021 predicts that the global wearable devices in sports market will grow with a CAGR of 17.6% between 2021 to 2028 to reach \$44,825m by the end of the forecast period.

Connected sensors (addressable market of 240m units/year): this application includes environmental sensors, smart commercial buildings and smart manufacturing. Here the goal is to integrate miniature (1–50mAh) batteries with energy harvesting devices, namely, small solar panels that top-up the charge during the day or piezo-electric crystals, so that a wireless sensor can be installed in a hard-to-reach area such as wind turbine blade and then left for several years without incurring the cost of a maintenance person replacing the battery. This approach requires a battery that can undergo multiple thousands of charge/discharge cycles over a lifetime of five to 20 years before needing to be replaced, so a solid-state battery becomes a more cost-effective option than a conventional lithium-ion battery. These types of applications also require batteries that can withstand temperatures of -20°C to +85°C, which conventional lithium-ion batteries do not.

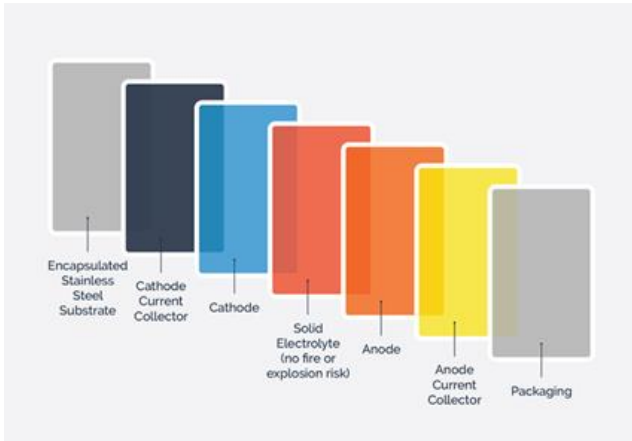
Competitive environment

Deposition of components on stainless steel substrate in volume is proven

Ensurge's process for making solid-state lithium batteries is based on the anode-less solid-state battery technology developed by Oak Ridge National Laboratory (ORNL) in the United States during the 1990s, which is no longer under patent. This technology has been shown to charge rapidly and to have a lifetime of over 1,000 charge/discharge cycles. Ensurge has adapted this technology so that the layers forming the battery are printed on a very thin steel substrate that has been treated with a proprietary barrier technology so that electronic components can be printed on it. Since steel is available as very thin foils, this a battery where the substrate takes up a smaller proportion of the total volume, immediately improving energy density by c 30% compared with using silicon substrates as used by Cymbet and Ilika. Moreover, manufacturing batteries on a silicon substrate is more complicated because it requires additional processing steps to make the silicon substrate, which comes in a standard thickness, thinner. Having a steel support rather than part of a silicon wafer means that the battery is flexible and durable and can easily be made in unusual

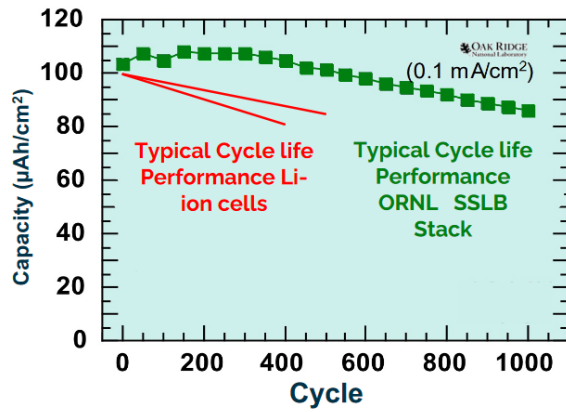
shapes such as rings. In contrast, silicon wafers are brittle and crack easily. Since steel is naturally air- and water-tight the substrate is a good packaging material, preventing moisture or oxygen from reacting with the lithium metal forming the battery anode. This means fewer layers that only provide a packaging function are required, which also improves energy density. It is also relatively easy to stack cells made on a steel substrate.

Exhibit 2: Structure of Ensurge’s solid-state lithium battery (in use)



Source: Ensurge Micropower

Exhibit 3: Cycle life comparison



Source: Ensurge Micropower capital markets presentation January 2022

Ensurge has already proved that it can manufacture high-performance electronics components in volume on the steel foil substrate through the manufacture of several million EAS tags. While it has not manufactured solid state batteries in volume yet, the battery manufacturing process uses a subset of already proven manufacturing processes and installed equipment, thereby minimising the risk of new technology implementation.

Ensurge already has volume manufacturing facility

Management has previously estimated that Ensurge’s existing R2R facility, in which it invested over \$40m for the production of EAS and NFC tags, has the capacity to output around 50m milliamp-hour class microbatteries per year, depending on the distribution of battery capacities. The company does not need any material capital expenditure to modify any of the existing tools for battery production. This means that it does not need to raise finance to fund the capacity expansion required to move to volume production or alternatively to find a manufacturing partner that will take a share of the profits. This position is in contrast with AIM-listed Ilika, which only has the capacity to produce 350,000 batteries/year from its Stereax microbattery pilot line, which management notes represents an expected revenue generating capability at peak capacity of £12m per annum.

Exhibit 4: R2R deposition at Ensurge’s facility in San Jose



Source: Ensurge Micropower

Economic benefits of the R2R process

A continuous R2R process is much more cost-effective than processing batches of individual silicon wafers. We note that ceramic substrates are brittle and therefore unsuitable for use in R2R production processes.

Competitors not addressing mWh category

Our review of the competitive landscape shows that other companies developing solid-state batteries address applications that require either less power than Ensurge's batteries can potentially provide or substantially more power so they are suitable for electric vehicles (EVs). Exhibit 5 summarises companies offering microbatteries, not larger batteries for EVs, so it excludes companies such as Solid Power and QuantumScape, which are focused on the EV market.

Exhibit 5: Competitive review of companies developing microbatteries

| Company | Charge capacity | Substrate | Commercial status | Capacity |
|-----------------------|---------------------------|----------------|---------------------------------|--|
| Cymbet | 0.005mAh and 0.05Ah | Silicon | Shipping | Volume capacity through X-fab |
| Ensurge Micropower | 1mAh+ | Flexible steel | Samples available later in 2022 | c 50m units/year |
| FDK Corporation | 0.5mAh | Not specified | Samples delivered 2019 | Not specified |
| Front Edge Technology | 0.1–1.0mAh and 0.5–5.0mAh | Flexible | Samples delivered | Annual capacity of 200,000 pieces of 1mAh under construction |
| Ilika | 0.25mAh available | Silicon | Samples delivered | 350,000 batteries/year |
| Iten | 0.3mAh under development | | | |
| | 0.25mA and 0.5mAh | Not specified | Shipping | 10m units/year in December 2018 with potential to increase this fivefold |
| TDK Corp | 0.1mAh | Not specified | Shipping | Not specified |

Source: Edison Investment Research, company websites

Progress against strategy

Establishing a sales pipeline

In early February 2022 Ensurge announced the signing of a customer agreement with a Fortune 500 industrial company active in manufacturing capital equipment. Under the terms of the agreement, Ensurge will deliver solid-state microbatteries optimised for the customer's specific application. Ensurge expects the initial payment under this agreement in the near future. The agreement, which is the company's fifth to date, is significant because it marks its entry into the IoT and industrial applications. This new agreement follows one in the digital health market as well as two earlier agreements in the medical hearables market and one in the broader wearables market, giving Ensurge customers in each of its four target markets. Under the terms of the agreement with the customer in the digital health market, Ensurge will deliver customised solid-state microbatteries for production starting in Q422. Ensurge is receiving several milestone-based payments for the customisation. In some cases, such as smart rings and smart contact lenses, a potential customer's planned products are only viable if they incorporate Ensurge's microbatteries with their highly customisable form factor and architecture. Ensurge is actively engaged with several additional prospects in the medical wearables and industrial markets, with multiple proposals currently in negotiation. Management notes that there are currently 10 Tier 1 OEMs awaiting microbattery samples.

Preparing for initial shipments of sample microbatteries

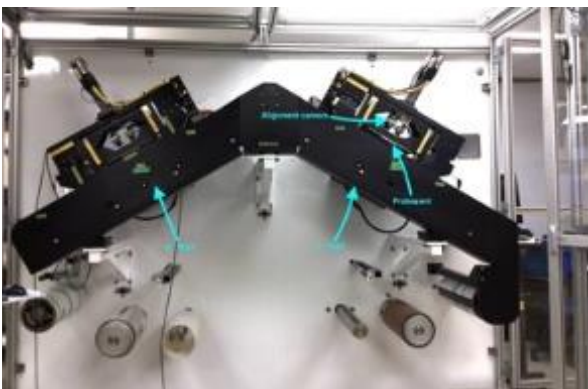
In April 2021 Ensurge confirmed that its first prototype cells demonstrated the key performance parameters expected. Following that technological breakthrough, during Q321 Ensurge installed and qualified the equipment needed to progress from developing and validating individual unit cells to stacking cells on top of each other, encapsulating them and adding connection points to form complete microbatteries. This enabled it to complete its first functional stacked batteries later in the

quarter. Having achieved that significant step, in Q421 the company worked on improving the performance of the complete microbatteries. While it was able to demonstrate working batteries formed from cells produced using both sheet-based and roll-based production techniques, these did not perform well enough for Ensurge to ship samples to potential customers by the year end, as management had initially hoped. Instead Ensurge shipped mechanical samples to customers so they could start to validate the processes for integrating Ensurge's microbatteries into their products, thus mitigating the impact of the delay in receiving functional samples on their potential product launches. Ensurge is continuing to work on improvements to the packaging process and battery integration with the intention of shipping functional samples 'in the short-term'. Importantly, the knowledge acquired so far means that the engineering team is able to turn around new device iterations much more quickly than when it started making devices. Management expects to have a double-digit number of customers evaluating the company's microbatteries later in 2022, ahead of volume production from Q422. The evaluation phase will typically involve designing the optimum microbattery form factor to meet the requirements of a specific customer's products.

Preparing for volume manufacture

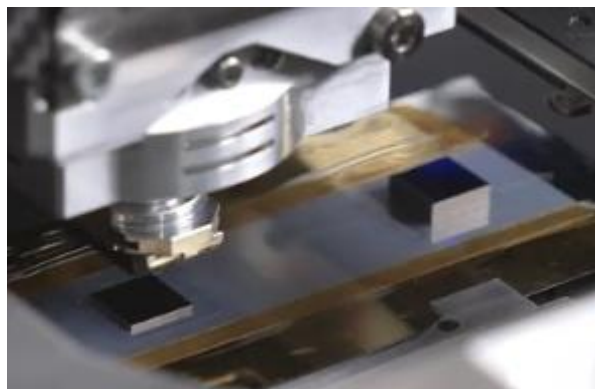
By mid-2021 Ensurge had successfully validated, ahead of schedule, the operational readiness of the full toolset required to manufacture batteries using a sheet-based process. It had also ordered the initial tool conversions for the R2R production line, which had been originally set up to manufacture electronic tags not microbatteries. Importantly, the company was able to confirm that it could successfully deposit battery materials of the required quality on ultrathin 10-micron steel substrates with its existing R2R equipment with expected performance. During H221, Ensurge made further improvements, upgrading some of the R2R equipment to make it more suitable for manufacturing solid state lithium batteries. The company also received an automated metallization tool, which is currently in the final stages of qualification. Management anticipates needing to acquire and install incremental equipment capacity to meet customer demand.

Exhibit 6: Roll-to-roll test



Source: Ensurge Micropower

Exhibit 7: Cell stacking



Source: Ensurge Micropower

Management

Kevin Barber joined Ensurge as CEO in November 2018. He was previously senior vice president and general manager of the mobile division of Synaptics, where he helped grow revenue fourfold to over \$1bn annually. Prior to that he was CEO of ACCO Semiconductor, a venture capital-funded start-up. Before that he was senior vice president and general manager of mobile business at Skyworks Solutions, where he led the strategy, achieving top RF power amplifier market share in the high-growth mobile market. He has also served as senior vice president of operations at Conexant.

Dave Williamson joined Ensurge in February 2020 and became acting CFO in June 2020. During FY21 Ensurge appointed globally recognised energy storage innovator Dr Shirley Meng to its Technical Advisory Board and hired industry veterans Vijay Parmar as VP sales & marketing and Jay Tu as VP operations.

Shareholder list

Exhibit 8: Top 10 shareholders at 6 March 2022

| Name | Holding |
|----------------------|---------|
| UBS Switzerland AG | 16.0% |
| Tigerstaden AS | 10.1% |
| Alden AS | 9.7% |
| Middelborg Invest AS | 5.9% |
| Nordnet Bank AB | 4.1% |
| R. Sunvall Invest AS | 2.6% |
| Favuseal AS | 2.5% |
| Forte Norge | 1.7% |
| BNP Paribas | 1.6% |
| Runar Forsland | 1.6% |

Source: Company data

Financials

Ensurge did not generate revenues during FY21 and the \$0.5m revenues in FY20 related to sales of legacy stock of anti-theft tags. Payroll costs were \$2.5m higher year-on-year in FY21 at \$7.3m as management invested in engineering, manufacturing and business development personnel, and premises costs were \$0.6m higher as the R2R line was prepared for production, contributing to a widening of EBITDA losses, excluding share-based payments, by \$3.3m to \$14.6m. Investment in capital expenditure totalled \$1.8m compared with only \$0.2m a year previously, reflecting the work adapting the R2R facility for volume manufacture of microbatteries instead of EAS and NFC tags. All R&D activity was expensed. Following a fund-raising programme generating \$2.7m (net) from a private placing in March 2021 at NOK0.82/share and exercise of the remaining warrants, net debt at end FY21 totalled \$4.5m (excluding restricted cash of \$1.6m and \$10.9m of finance leases).

During H221, management flagged that it intended to seek additional financing from the investor market to fund the company's activities further into 2022. In February 2022 Ensurge completed a private placement and share allocation raising approximately NOK100m gross (\$11.3m) at a subscription price of NOK0.60/share. Large existing shareholders participating in the placement included Robert Keith (NOK15m), Alden (NOK11.7m), Tigerstaden (NOK10.1m) and Middelborg Invest (NOK8m). The net proceeds will be used for general corporate purposes, which include expanding the company's manufacturing capabilities and its presence in new evolving markets. The total number of offer shares (166.7m) represents less than 10% of the issued and outstanding number of shares in the company so the transaction is not materially dilutive. In addition, subscribers to the private placement will receive two non-tradeable warrants for every two offer shares. 50% of these warrants (Tranche 1) will be exercisable on 30 June 2022, raising up to NOK50m (\$5.5m) and the remaining 50% (Tranche 2) will be exercisable on 30 November 2022, also raising up to NOK50m.

In February, management noted that, based on the assumption that the Tranche 1 warrants will be fully exercised on 30 June 2022, the group and parent company would have sufficient funds to support operations into Q322. Potential funds from the exercise of Tranche 2 warrants would then fund the company's activities beyond Q322. If the warrants are not sufficiently exercised or there is a need for bridge financing prior to the Tranche 2 exercise date, Ensurge will seek additional funds from the investor market or from partnership funding. Management intends that the recent fund-raising programme will provide sufficient funds to give adequate time to demonstrate a series of

technology and market development milestones. Shareholders also approved a nine for one share consolidation at the EGM in February 2022, effective from 11 March 2022.

Valuation: Addressing a market of over 1bn units/year

Since Ensurge is still at the pre-revenue stage with regards to its solid-state battery technology, we continue to present a scenario analysis rather than a formal valuation based on peer multiples.

Exhibit 9: Potential annual revenues from milliWatt hour market (\$m)

| | | Market share (%) | | | | |
|--------------------|----|------------------|-----|-----|-----|-------|
| | | 1% | 3% | 5% | 7% | 10% |
| Price/unit (\$) | 1 | 11 | 33 | 55 | 77 | 110 |
| | 2 | 22 | 66 | 110 | 154 | 220 |
| | 3 | 33 | 99 | 165 | 231 | 330 |
| | 5 | 55 | 165 | 275 | 385 | 550 |
| | 7 | 77 | 231 | 385 | 539 | 770 |
| | 10 | 110 | 330 | 550 | 770 | 1,100 |

Source: Edison Investment Research

Referencing research from IDTechEx, and others, management notes that the medical wearables, hearables, connected sensor and sport and fitness wearables markets are predicted to grow to over 1bn units/year by 2025. As discussed above, these markets require batteries in the mWh–1Whr capacity range. This capacity range is already covered by conventional lithium-ion batteries, though the relative size of lithium-ion batteries compared to solid-state batteries makes it likely that a material percentage of device manufacturers will elect to pay a premium for the solid-state option. Consequently, while we note that Farnell sells 5.5mAh conventional lithium-ion rechargeable coin cells from Seiko Instruments for £1.34–2.99 (ex-VAT) depending on volume required, Ensurge has had detailed conversations with potential customers with which it has shared design details and in H121 stated that it believed a price of \$3–10/unit was achievable. Our scenario analysis presents the annual revenues realisable from these markets for a range of unit prices and levels of market penetration. The analysis shows that a 5–10% share of these markets at a \$3–10 price range represents annual revenues of \$330–550m. Based on previous management guidance of c \$20m fixed costs (current levels are \$14.6m), and 30% variable costs, this gives an EBITDA range of \$211–365m. Management notes that when the R2R factory in San Jose is fully utilised it should be able to output several hundred million mAh of batteries each year, potentially generating EBITDA of over \$100m depending on product mix.

Sensitivities

The key sensitivities as we see them are:

Technology risk: Ensurge has already made development samples of microbatteries using its stainless-steel substrate technology. However, it still needs to optimise the process so that the microbatteries exhibit the performance required for use in commercial products.

Commercial risk: since Ensurge has not started to sell product in commercial volumes yet, there remains some risk that it will not be able to offer product at an appropriate price point. However, since Ensurge has already run the R2R facility as a commercial operation, it should be able to calculate the cost of manufacturing batteries at volume fairly accurately. Moreover, as its solid-state lithium batteries are proposed as a substitute for conventional lithium-ion batteries, particularly coin and button batteries, there is already a reference price point that potential customers can use when deciding whether the premium for the superior energy density, cycling and safety offered by Ensurge's alternative is merited. Noting that Ensurge has already signed agreements with five customers and has agreed to deliver customised solid-state microbatteries for production to one of

them, we believe the risk of not being able to manufacture the batteries at an acceptable price point is significantly reduced.

Scale-up risk: the existing R2R facility was used to manufacture several million anti-theft tags. Ensurge has demonstrated that it is able to manufacture complete microbatteries from cells made on the R2R line and can deposit battery materials of the required quality on ultrathin 10-micron steel substrates with its existing R2R equipment with expected performance. We believe therefore that it is reasonable to assume that there is relatively little risk in getting the R2R production to manufacture microbatteries in volume.

IP protection: Ensurge has filed patents to protect core battery layer innovations as well as unique methods of cell packaging, including sealing, assembly, stacking and interconnection. This includes ensuring that the steel substrate, which is by nature highly conductive, is treated so that does not short out the components deposited on it. It has also built-up considerable expertise in volume manufacturing of flexible electronics using R2R equipment. However, very large battery companies such as CATL and LG Electronics do have the in-house expertise to adapt the original solid-state technology from Oak Ridge National Laboratory to create their own battery stacks. We believe it would be possible for established battery companies to develop their own variants of Ensurge's technology, copying the use of a steel substrate to get the energy density required to create cells with mAh scale capacity. Given the effort required though, we believe it is more likely that they would license the underlying technology or possibly even consider acquiring Ensurge outright. However, at the moment these larger companies are focusing their development resources on much larger batteries for the EV market, where volumes are more suited to their business models.

Dependence on customers: the level of market penetration that Ensurge will achieve is largely dependent on the success of sales and marketing programmes undertaken by its customers.

Supply chain issues: supply chain shortages, particularly of steel foil, have had some impact on Ensurge, but these issues have been managed. Supply chain issues have had more of an impact on optimising the R2R line for microbattery production, as COVID-19 travel restrictions have meant that equipment suppliers have had to provide installation support via the internet.

Funding: as discussed above in the financials section, management has flagged that it may need to seek additional financing if the warrants are not sufficiently exercised or there is a need for bridge financing prior to the Tranche 2 exercise date.

Exhibit 10: Financial summary

| | \$m | 2018* | 2019* | 2020 | 2021 |
|--|-----|--------|--------|--------|---------|
| Year end December | | IFRS | IFRS | IFRS | IFRS |
| PROFIT & LOSS | | | | | |
| Revenue | | 3.4 | 1.2 | 0.5* | 0.0 |
| EBITDA | | (49.3) | (30.6) | (11.3) | (14.6) |
| Operating Profit (before amort. and except.) | | (53.3) | (34.5) | (11.4) | (14.6) |
| Intangible Amortisation | | 0.0 | 0.0 | 0.0 | 0.0 |
| Exceptionals | | (15.6) | (42.4) | 0.0 | 0.0 |
| Share-based payments | | (1.8) | (0.2) | (0.7) | (4.9) |
| Operating Profit | | (70.6) | (77.1) | (12.0) | (19.6) |
| Net interest | | (1.1) | (1.4) | (3.6) | (2.6) |
| Exceptional charges relating to issue of warrants | | 0.0 | 0.0 | (23.2) | (8.8) |
| Profit Before Tax (norm) | | (54.3) | (35.9) | (14.9) | (17.2) |
| Profit Before Tax (FRS 3) | | (71.7) | (78.5) | (38.8) | (31.0) |
| Tax | | (0.0) | 0.0 | 0.0 | 0.0 |
| Profit After Tax (norm) | | (54.4) | (35.9) | (14.9) | (17.2) |
| Profit After Tax (FRS 3) | | (71.7) | (78.4) | (38.8) | (31.0) |
| Average Number of Shares Outstanding (m) | | 58.6 | 58.6 | 393.2 | 1,368.3 |
| EPS - normalised (\$) | | (0.93) | (0.61) | (0.04) | (0.01) |
| EPS - (IFRS) (\$) | | (1.22) | (1.34) | (0.10) | (0.02) |
| Dividend per share (\$) | | 0.00 | 0.00 | 0.00 | 0.00 |
| EBITDA Margin (%) | | N/A | N/A | N/A | N/A |
| Operating Margin (before GW and except.) (%) | | N/A | N/A | N/A | N/A |
| BALANCE SHEET | | | | | |
| Fixed Assets | | 35.3 | 0.6 | 0.8 | 2.6 |
| Intangible Assets | | 2.4 | 0.0 | 0.0 | 0.0 |
| Tangible Assets | | 22.5 | 0.0 | 0.2 | 2.0 |
| Other | | 10.4 | 0.6 | 0.6 | 0.6 |
| Current Assets | | 44.1 | 11.7 | 6.9 | 8.7 |
| Stocks | | 2.6 | 0.0 | 0.0 | 0.0 |
| Debtors | | 8.9 | 2.8 | 1.1 | 1.8 |
| Cash excluding restricted cash | | 31.0 | 7.3 | 4.2 | 5.3 |
| Restricted cash | | 1.6 | 1.6 | 1.6 | 1.6 |
| Current Liabilities | | (8.1) | (6.8) | (32.7) | (8.0) |
| Creditors | | (8.1) | (5.5) | (29.5) | (4.1) |
| Short term borrowings | | 0.0 | (1.4) | (3.2) | (3.9) |
| Long Term Liabilities | | (11.5) | (25.1) | (21.9) | (16.8) |
| Long term borrowings excluding finance leases | | 0.0 | (11.8) | (9.7) | (5.9) |
| Other long term liabilities | | (11.5) | (13.2) | (12.2) | (10.9) |
| Net Assets | | 59.7 | (19.7) | (46.9) | (13.4) |
| CASH FLOW | | | | | |
| Operating Cash Flow | | (52.3) | (29.1) | (11.9) | (14.6) |
| Net Interest | | 0.3 | (1.4) | (3.2) | (3.2) |
| Tax | | (0.1) | 0.0 | 0.0 | 0.0 |
| Capex | | (11.2) | (5.1) | (0.3) | (1.8) |
| Acquisitions/disposals | | 0.0 | 0.0 | 0.0 | 0.0 |
| Financing | | (0.0) | 0.0 | 13.3 | 25.2 |
| Dividend payments and Other items | | (1.6) | 0.0 | 0.0 | 0.0 |
| Net Cash Flow | | (64.9) | (35.5) | (2.1) | 5.6 |
| Opening net debt/(cash) excluding finance leases | | (96.5) | (31.0) | 5.9 | 8.8 |
| Finance leases initiated | | 0.0 | 0.0 | 0.0 | 0.0 |
| Other | | (0.6) | (1.4) | (0.7) | (1.3) |
| Closing net debt/(cash) excluding finance leases and restricted cash | | (31.0) | 5.9 | 8.8 | 4.5 |

Source: Company reports. Note: *Discontinued business.

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