

Leclanché

Powering up

Over the last three years, Leclanché has been transformed into a vertically integrated group. It has begun work on a multi-million contract for one of the world's largest stationary battery energy storage systems to date, supplying not only the battery modules but also the system integration and engineering, procurement and construction (EPC) work. It has also established a presence in the e-transport sector, for example partnering with Skoda Electric on battery solutions for e-buses. Completion of the ongoing financing round is required to enable the group to deliver against its pipeline totalling over 450MWh of energy storage, scheduled for delivery during FY17, FY18 and FY19.

Year end	Revenue (CHFm)	PBT* (CHFm)	EPS* (CHF)	DPS (CHF)	P/E (x)	Yield (%)
12/16	28.1	(36.8)	(0.8)	0.0	N/A	N/A
12/17e	28.1	(22.6)	(0.4)	0.0	N/A	N/A
12/18e	114.7	(2.6)	(0.0)**	0.0	N/A	N/A
12/19e	184.9	13.8	0.2**	0.0	12.6	N/A

Note: *PBT and EPS are normalised, excluding amortisation of acquired intangibles, exceptional items and share-based payments. **Assuming outstanding loan notes convert to equity end June 2018.

Platform for growth established

Revenues, including CHF2.2m funding for a European ferry project, rose by 40% year-on-year during H117 to CHF8.0m. Revenue growth would have been substantially stronger if Leclanché had had sufficient funding to make faster progress on two large ongoing stationary energy storage projects in North America. As a result of financing constraints, management expects FY17 revenues to be similar to FY16. The financing situation did not prevent the company from adding to its pipeline of projects in both the stationary storage and e-mobility sectors. EBIT losses narrowed, from CHF15.6m to CHF11.5m, reflecting the restructuring and cost-reduction exercises taken in late FY16 and early FY17.

Financing will support ability to deliver on pipeline

The portfolio of projects that have already been won or are expected to be awarded for delivery during 2017, 2018 and 2019 totals over 450MWh. Around 115MWh of this pipeline relates to firm contracts, more than double the deliveries achieved in FY16. Completion of the ongoing financing activities (we estimate a funding gap of c CHF25m) should enable Leclanché to execute these contracts.

Valuation: Dependent on rate of market penetration

Our indicative valuation is based on three scenarios, which assume market penetration across the three target markets of 1.0%, 1.6% (equivalent to the growth rate adopted in our estimates) and 5.0%. A DCF analysis of each of the three scenarios gives an indicative valuation range of CHF2.55 to CHF13.96 per share, and CHF4.34 for the growth rate adopted in our estimates. This indicates potential for substantial share price appreciation as Leclanché demonstrates it is able to secure the additional financing required, and execute the existing pipeline.

Initiation of coverage

Alternative energy

15 November 2017

Price CHF2.52
Market cap CHF165m

Net debt (CHFm) at end June 2017 (including CHF23.8m convertible loan) before placing and subscriptions raising CHF18.4m 26.3

Shares in issue 65.5m

Free float 63.3%

Code LECN

Primary exchange SIX

Secondary exchange N/A

Share price performance



% 1m 3m 12m

Abs 10.4 6.3 (4.2)

Rel (local) 12.6 5.1 (17.1)

52-week high/low CHF2.95 CHF2.09

Business description

Leclanché is a fully vertically integrated energy storage solution provider. It delivers a wide range of energy storage solutions for homes, small offices, large industries and electricity grids as well as hybridisation for mass transport systems such as bus fleets and ferries.

Next events

FY17 results April 2018

Analyst

Anne Margaret Crow +44 (0)20 3077 5700

industrials@edisongroup.com

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Investment summary

Company description: 100 years of energy storage expertise

Building on Leclanché's century-long heritage of battery chemistry, CEO Anil Srivastava has transformed the company into a business offering complete energy management systems and associated services for the utilities, e-transport, commercial and industrial sectors. Navigant forecasts that these three market segments will grow at 37-58% CAGR until 2025, reaching US\$18bn in 2020. Importantly, each of these markets is forecast to require multiple gigawatt hours of energy storage capacity by 2020. Capturing a meaningful market share would enable Leclanché to achieve the economies of scale required to be competitive on the world stage. The company's transformation has been achieved through a sequence of acquisitions and strategic partnerships commencing in May 2015, combined with significant investment developing in-house engineering capability. The vertical integration means that the group has a clearly differentiated offer and can capture a greater proportion of the value associated with battery energy storage projects.

Financials: H117 revenue growth held back by financing

The ramp-up in growth in large-scale energy storage systems that was expected during H117 was held back by lack of financing. However, these projects have been delayed, not lost, and additional work has been secured during the period, so the portfolio of projects that have been awarded or are expected to be awarded for delivery during 2017, 2018 and 2019 totals over 450MWh. 115MWh of this pipeline relates to confirmed orders, which is more than double the deliveries achieved in FY16, though many of the deliveries that management had originally expected to take place during FY17 will now be postponed to FY18. Our estimates show the year-on-year increase in megawatt hours delivered converting to strong revenue growth throughout the forecast period, reaching CHF184.9m in FY19 and generating CHF17.1m EBITDA. This is equivalent to 1.4% market penetration. Management has been actively addressing the financing situation through a sequence of capital market transactions in H117 and into H217, summarised in Exhibit 7 in the financial section.

Valuation: Dependent on the rate of penetration of key markets

Our indicative valuation is based on three scenarios, which assume market penetration across the three target markets of 1.0%, 1.6% and 5.0%. Market penetration of 1.6% is equivalent to the growth rate adopted in our estimates. A DCF analysis of each of the three scenarios (terminal growth rate of 2% for all three, WACC of 13.0%, 15.0% and 17.0%, respectively, to reflect the relative levels of risk) gives an indicative valuation range of CHF2.55 to CHF13.96 per share, and CHF4.34 for the growth rate adopted in our estimates. The current level of the share price (CHF2.52) suggests that the market is pricing in some execution risk as well as dilution risk. This indicates potential for substantial share price appreciation as Leclanché demonstrates it is able to secure the additional financing required, convert the existing pipeline and achieve the growth rate shown in our estimates.

Sensitivities: Execution risk with further volume ramp-up

The sales pipeline is currently dominated by a small number of large projects. Execution of larger projects is dependent on completing the current financing round. Leclanché is currently reliant on third parties for some of the value-added capability, although it is building up in-house teams to address this. It has not proved that it can produce battery modules in the volumes or at the price point required to support growth through FY17 and FY18. There is risk that Leclanché's technology may be overtaken by new developments, but in that case it would substitute batteries from third parties in its energy storage systems.

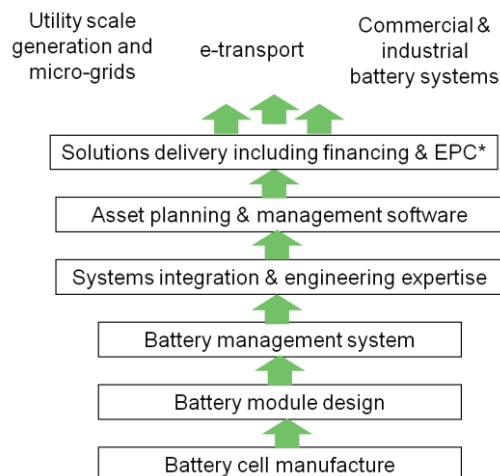
Company description: Energy storage solutions

Leclanché is a vertically integrated provider of energy management systems for the utilities, e-transport, commercial and industrial sectors. All of these are growing strongly, driven by a shift to decarbonised, decentralised and digitalised energy generation. Building on its century-long heritage of battery chemistry, CEO Anil Srivastava has transformed the company from one focused simply on sophisticated battery technology, to a business offering complete energy management systems that is able to compete successfully with global majors. This was amply demonstrated by winning the contract to supply and install the largest energy management system in the world to date, which is in Canada. The contract requires 53MWh of battery storage capacity and is worth US\$45m. The group now addresses markets forecast by Navigant to grow at a 37-58% CAGR until 2025, reaching US\$18bn in 2020.

Leclanché's headquarters are in Yverdon-les-Bains, Switzerland, where battery module integration takes place. It has a large-format lithium ion cell manufacturing plant in Willstätt in Germany and a systems R&D hub in Turnhout, Belgium, which specialises in low-voltage mobility solutions. It employs over 150 staff, including around 50 people with engineering qualifications, around 40% of whom are engaged in software development. Depending on the scale and scope of the deployment, Leclanché sells systems through OEMs, distributors and direct to end-users. It already has a commercial presence in most countries in Europe, North America and Asia. For example, it opened its first North American office in April 2016 to build on its landmark win in Canada.

New strategy to deliver profitable growth

Exhibit 1: Vertically integrated energy management



Source: Edison Investment Research. Note: *Engineering, procurement and construction.

Under CEO Srivastava's leadership, Leclanché has developed into a vertically integrated company, controlling all phases of implementation from design and manufacture of the battery cells to installation of complete systems. Prior to this transition, Leclanché was attempting to compete in the supply of battery cells with much larger companies that were able to achieve economies of scale, so margins were heavily compromised. Now the focus has changed to the delivery of complete systems. This changes the competitive environment (see below) as only one of the larger competitors, LG, is vertically integrated. It also gives Leclanché access to substantially more of the value chain. Battery cells are typically only 50% of the total value for a large energy storage system, engineering, procurement and construction (EPC) services are 12% and energy management systems are 6%. Software is a key element of the integrated offer, reflecting the more general trend of digitalisation in the energy industry. For example, Leclanché is developing a cloud-based asset

operations software pack for managing both stationary energy storage systems and transport fleets such as electric buses, ferries and charging infrastructure. Neither Leclanché nor the larger battery manufacturers are active in power conversion systems, which account for another 23% of the value of a battery energy storage system (BESS).

First phase: Repositioning

The first phase of the turnaround is now complete. Through a succession of strategic partnerships and acquisitions, shown in Exhibit 2, combined with investment in the recruitment of software developers and other engineering staff, management has created a platform able to operate at each stage of the supply chain shown in Exhibit 1. In addition, Leclanché has become selective about the markets addressed and is now focused on high-growth segments where it should be possible to achieve higher margins through the provision of complete energy storage solutions and where there is the potential to sell significant volumes of batteries. As part of this process, Leclanché has added complementary G-NMC (graphite anode and nickel-manganese-cobalt cathode) technology, thus expanding its addressable market to include applications where the amount of energy stored per unit volume is critical. It has also increased production capacity so that it can supply the higher volumes required, delivering 30MWh in 2016 (c 0.6% of the global deliveries in the three target markets) compared with 5MWh in 2015. The strategy has been relatively successful, with the company completing reference projects in each of the new target segments within two years of launching the turnaround strategy. The strategy delivered a 56% increase in revenues during FY16. Growth slowed to 40% in H117 due to the lack of financing.

Exhibit 2: Strategic partnerships

Date	Company	Rationale
May 2015	Visedo	Collaboration combining Visedo's electric drive trains with Leclanché's battery systems to address e-transport applications
May 2015	Litarion	Agreement to supply G-NMC electrodes for incorporation into Leclanché's lithium-ion batteries
July 2015	Trineuron	Acquisition to secure solution integration capability and customer-base in e-transport sector
August 2015	ADS-tec	Non-exclusive right to use battery management system for building battery modules and solutions for energy management of hybrid energy systems
October 2016	SGEM	Partnership to provide financing for projects with Leclanché acting as an EPC and OEM

Source: Edison Investment Research

Second phase: Driving revenue and profit growth

Management is now addressing the second phase of the turnaround: delivering continued revenue growth and margin improvement. It has demonstrated conclusively that it can deliver large-scale projects, having delivered 30MWh of capacity during FY16. However, progress during H117 on large-scale projects was severely held back by lack of financing. The actions management is taking to secure funds for the group are discussed later in the Financials section. Management is also exploring options for financing individual large projects. Swiss Green Electricity Management (SGEM), which arranges financing for battery energy storage infrastructure, provided CHF8m equity towards a utility scale project in Chicago and a CHF15m construction loan towards the Canadian project. Management is in discussions with SGEM regarding finance to complete these two key projects. It is in discussions with other financial institutions to widen the pool of backers able to support other projects collectively requiring over US\$100m. Since energy management and storage (other than pumped hydropower systems or utility-scale flywheels) is a relatively new technology, there are very few companies prepared to finance utility-scale energy storage systems. In this respect, the industry is similar to the infant solar power industry.

In parallel, management is implementing a programme to improve margins. Capacity has not been fully restored at the German cell manufacturing facility following the fire there in April 2016. Only batteries deploying Leclanché's proprietary lithium titanate oxide (LTO) technology are manufactured there at present. G-NMC batteries are sourced from a supplier in Asia that enjoys sufficient economies of scale to be able to produce cells cost-effectively. Leclanché is currently

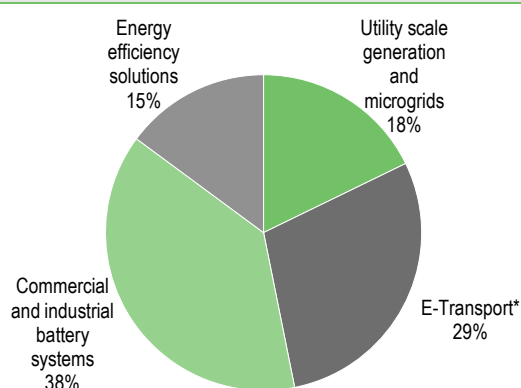
working on cell efficiency improvements that will make the cells cost-competitive, so that it can resume in-house production in H118 as G-NMC demand ramps up. It also intends to join an Asian consortium that will give it access to the same raw materials sourcing prices as larger battery manufacturers. Other initiatives to improve margins (group gross margin was only 4.6% in H117) include bringing module assembly and testing in-house, and enhancing in-house software and systems integration capabilities so that more of the work on large projects can be delivered from in-house resources. Assuming that the ongoing financing programme completes successfully, management intends to acquire certain energy management software assets, which it estimates would enhance gross margin by 3.5 percentage points.

Management has instigated a restructuring of the operating businesses, which it expects to be complete by end FY17. It is creating two wholly owned subsidiaries: one focused on stationary storage activities, which will include commercial and industrial scale projects going forward; the other on e-transport activities, which will include automatic guided vehicles (AGVs), revenues attributable to which are currently included in the commercial and industrial segment. Management expects the combination of revenue and margin growth to result in a break-even situation at EBITDA level when deliveries exceed 100MWh/annum, which it anticipates reaching in late FY18/H119. Our estimates model deliveries of over 140MWh in FY18, generating CHF1.4m EBITDA.

Growing markets

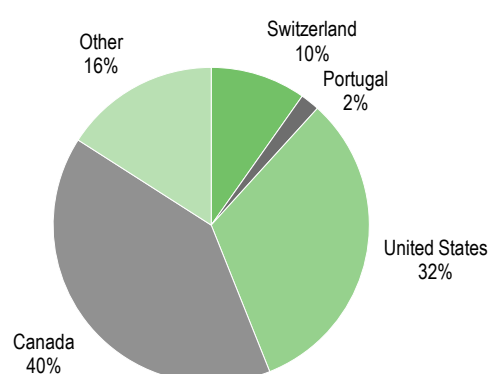
Management has selected markets where the potential volume of storage required in the medium term is greatest. These are utility-scale generation and microgrids, e-transport and commercial and industrial buildings. Leclanché is able to address these multiple markets without incurring the cost of supporting multiple products because 80% of system elements – cell modules, battery management systems and drive train/inverters – are common across the sectors served, with customisation delivered through software and integration.

Exhibit 3: H117 revenues by sector



Source: Leclanché data. Note: *Including CHF2.2m EU grant for e-transport application.

Exhibit 4: FY16 revenues by geography



Source: Leclanché data

Utility-scale generation and microgrids (H117 revenue CHF1.4m, EBITDA loss CHF2.0m)

Industry analyst Navigant forecasts that the utility-scale generation and microgrids market will grow from 0.9GWh in 2016 to 4.2GWh in 2020, ie a 48% CAGR. Bloomberg New Energy Finance predicts a 49% CAGR over the same period. This is the most significant opportunity for Leclanché in the short to medium term because of the volumes of battery modules required for each project. A high proportion of Leclanché's 115MWh order backlog relates to this sector.

Utility-scale generation

Conventional gas, oil, coal or nuclear powered utility-scale power generation systems cannot respond quickly to changes in consumer demand, resulting in a mismatch between the output available and the amount required. The divergence between power generation output and consumer demand is more severe for countries where a significant proportion of electricity is generated from renewable sources. These have a continuously changing output, depending on intensity of cloud cover or wind strength. Historically utilities have addressed the mismatch by having additional power generation capacity on standby or storing energy in pumped hydro schemes or utility-scale flywheels. As the cost of battery energy storage systems (BESSs) is coming down, utilities are beginning to deploy these instead. A BESS is able to inject energy into the grid when there is a shortfall, replenishing it with energy from the grid when consumer demand is lower. It therefore helps to manage the amount of capacity in the grid ie providing reserve control. It also ensures that the electricity supplied is at the correct voltage and frequency, ie providing voltage control and frequency control, as both these properties deviate from their correct value if there is a mismatch between supply and demand. In addition, a major consumer of electricity can reduce costs by storing electricity provided on a cheap tariff in a BESS for use at peak times of demand when the tariff is higher (referred to as peak shaving). The operational costs and energy requirements of a BESS on standby are low compared to a conventional power station. In addition, a BESS is scalable, unlike a conventional power station, since its capacity can be easily increased by adding additional storage racks or containers. A BESS can be installed in six months, which is favourable when compared to several years for a conventional power station. Additionally a BESS can easily be moved to another location when required.

Energy storage is becoming increasingly important as a higher proportion of energy is generated from renewable sources. A [report](#) from Lux Research published in January 2016 predicted that distributed storage for solar systems would be worth US\$8bn in 2026, noting that solar-plus-storage is a key necessity for solar to overcome limitations like intermittency and the lack of power after dark and that demand management software that integrates storage with photovoltaic production is already a key differentiator.

Leclanché is currently working on one of the world's largest utility-scale stationary storage systems. This is a 53MWh system based on G-NMC technology located in Ontario, Canada. US\$28.9m of the US\$45.0m order relates to the BESS and associated power conversion system, the remainder to the engineering, procurement and construction work. Testing the installation at the two sites forming the first phase of the project is ongoing, with project completion scheduled for early FY18. In June 2016 Leclanché was selected as the EPC contractor and supplier of the battery energy storage system for a 10MWh grid-scale energy storage project in the Chicago area. In December 2016 Leclanché was awarded a contract related to a new 22MW BESS providing grid frequency control in North Germany. The first phase (2MW) is scheduled for delivery in Q417 on a build-own-operate transfer basis. Leclanché has an exclusivity arrangement with a major European utility for implementing the second phase (20MW). These three projects account for a meaningful share of the segment, estimated by Navigant to total 900MWh in 2016.

Microgrids

On some islands and other remote territories, connection to a main grid is either prohibitively expensive or impossible. Typically, energy is provided from diesel generators. This requires transportation of diesel fuel and high maintenance costs resulting in electricity that is four to 10 times more expensive than mains electricity. In addition the diesel generators are noisy and a source of air pollutants. These remote locations are increasingly deploying renewable sources to reduce diesel consumption, complementing these with BESSs to eliminate the mismatch between power output and consumer demand. Energy is taken from the BESS first, rather than activating the

diesel generators for a short period or a small load, so the diesel generators can be used less frequently and when they are used, used more efficiently.

Leclanché is involved in the largest hybrid project so far in Europe, which is on the island of Graciosa in the Azores. The project, which has a combined cost of €8.5m, half of which is attributable to the BESS, includes a 3.2MWh LTO BESS, a solar photovoltaic plant and a wind park, all controlled by an energy management system. This project will enable the island to increase the proportion of energy generated from renewables from 15% to 65%. Leclanché's scope of work included EPC for the battery park and consortium leadership for the project. Leclanché's LTO technology was chosen as it is the only lithium-ion variant with a lifetime of 20 years, which matches that of the other energy infrastructure assets.

Financial performance

Revenues almost halved from CHF2.5m in H116 to CHF1.4m in H117 (CHF8.2m H216), as financing constraints have restricted Leclanché's ability to progress existing projects. EBITDA losses reduced from CHF5.5m to CHF2.0m reflecting the cost saving measure taken in late FY16 and early FY17. Management expects this segment to be the principal driver of revenue growth during our forecast period. Our estimates assume 22MWh of installations during FY17, as work on ongoing projects is delayed by lack of financing, and 140MWh in FY18 (backed by completion of existing contracts and identified projects where the group is already in commercial discussions). This rises to 200MWh in FY19, which represents an estimated 7% of global installations. This is expected to drive segmental revenue growth from CHF15.0m in FY17e to CHF135.0m in FY19e. Our estimates model gross margin on hardware rising from 10% in FY17 to 20% in FY18, reflecting margin improvements associated with shipping higher volumes and improved cell efficiency. We model hardware gross margin remaining at 20% in FY19, assuming that pricing pressure is likely to offset further gains from higher volumes.

E-transport (H117 revenue CHF0.1m, EBITDA loss CHF0.6m)

As discussed in our initiation note on [Intelligent Energy](#), the key driver for the adoption of electric powered vehicles is the introduction of regulations reducing carbon emissions and particulate emissions from vehicles. On-board electrical energy storage, usually a battery, is a key component in the powertrain of an electric vehicle. The battery works as an energy buffer in hybrid vehicles, and as a single energy source in full-electric vehicles. Leclanché's battery systems may be adapted to any machine equipped with an electric powertrain. Leclanché can provide a high power option (LTO) and a high energy option (G-NMC) and a revolutionary hybrid battery that combines both technologies. Leclanché is focused on solutions for larger vehicles where weight is not an issue and where the vehicle will follow a pre-determined itinerary, returning to a depot regularly for charging under supervised conditions. Navigant Research forecasts that this market will grow from 1.7GWh in 2016 to 6.0GWh in 2020, ie a 37% CAGR. In the longer term, it has potential to be larger than stationary storage systems associated with the electricity grid. In May 2017 Lux Research [predicted](#) that electric vehicles and hybrids will push energy storage revenues in transportation to US\$69bn/year by 2025, while transformations in the electricity grid bring stationary storage to US\$19bn/year.

Leclanché is involved in a range of projects in this sector. Following the delivery in 2015 of the first three all-electric buses to operate in Belgium, in June 2017 Leclanché announced a Joint Development Agreement and Framework Purchase Contract with Skoda Electric. The agreement is global, with an initial term of five years and the first deliverable the release of a scalable 50-350kWh battery system by the end of FY17. This system will be certified for use in Europe, which industry analyst ZeEUS notes is the second largest market for electric buses, with 1,273 electric buses in service in 2016, more than double the 2015 level. Leclanché will provide both larger, high-energy G-NMC based systems for overnight charging and smaller, ultra-fast charge LTO systems for

topping up charge at bus stations during the day. An LTO cell-based module completed its quality certification testing in Beijing in Q117, opening up the electric bus market in China. This is a key market, with around 345,000 vehicles in service during 2016. Leclanché also has a framework agreement with a leading automotive integrator in India to provide battery packs for electric taxis. Management is also in discussions to supply battery systems to power trolley buses in the Czech Republic.

Electric vehicle charging systems

Adoption of battery-powered electric vehicles is being held back by the availability of public fast-charge stations. Electric vehicles are fairly restricted regarding the distance they can travel between charges, with typical family cars such as the Mitsubishi i-MiEV or Nissan LEAF managing less than one hundred miles. Authorities keen to promote electric vehicle adoption are considering deployment of battery energy storage systems able to recharge a vehicle in around 20 minutes, which is about the time of a motorway coffee break. This type of system also provides a potential solution to the additional amount of electricity required if a significant proportion of vehicles are powered by batteries, in which case existing energy networks would not be sufficient. Instead, renewable power generation sources could be constructed to meet the additional energy requirement, with the charge stored until needed. Leclanché is working with eCAMION, a Canada-based provider of modular smart energy storage solutions, and with SGEM to develop and install a C\$17.3m network of 34 fast-charging stations along the Trans-Canada Highway. These fast charge stations will use Leclanché's LTO batteries, which charge up slowly from the grid overnight and then discharge rapidly when required. Leclanché is also working on a battery storage solution for Fastned's fast charging electric vehicle stations, starting with a pilot at two locations. Fastned has built and is operating 63 fast charging EV stations in the Netherlands. Fastned is partnering with Transport for London on developing 300 fast charging points for deployment by 2020, and in September it was awarded a subsidy of €4.1m by the German government to build 25 fast charging stations.

Financial performance

During H117, reported segmental revenues were around half the prior year number (CHF0.1m vs CHF0.3m) as during H116 the company was working on a significant project to deliver a set of LTO cells for qualification in China for deployment in electric buses. These reported revenues exclude a CHF2.2m EU grant for an e-ferry project. Segmental EBITDA losses narrowed from CHF1.1m to CHF0.6m because of the cost reduction exercise referred to earlier. Our estimates model CHF2.9m revenues from this segment during FY17, to be generated from delivery of the battery system for Skoda and an LTO system for a medium-range commercial electric ferry operating between the islands of Ærø, Fynen and Als in southern Denmark (ie including the CHF2.2m grant). Our model shows revenue estimates increasing significantly during FY18 (CHF3.6m) and FY19 (CHF28.0m) as deliveries under the two framework agreements and the Trans-Canadian project begin to ramp up. Management estimates that the existing framework agreements could generate revenues of over CHF45m, representing delivery of over 150MW from FY19 onwards. We model segmental gross margin at 22% in FY17, in line with management guidance, falling slightly to 21% in FY18 and 20% in FY19 to reflect pricing pressure on hardware.

Commercial and industrial battery systems (H117 revenue CHF3.1m, EBITDA loss CHF0.6m)

This segment covers a diverse range of activities including material handling equipment, residential energy storage, telecoms, medical, defence, street lighting for smart cities and other speciality applications. Navigant Research forecasts that this market will grow from 1.8GWh in 2016 to 11.3GWh in 2020, ie a 58% CAGR.

Material handling equipment

Leclanché provides comprehensive energy storage solutions for industrial machines such as automatic guided vehicles (AGVs), forklifts and other material handling equipment. Leclanché's lithium-ion batteries can be fitted as a plug-in, lead-acid replacement for forklifts and other lifting equipment. The LTO batteries are more efficient than lead-acid technology, resulting in a 20% reduction in electricity costs, and charge very quickly, typically in nine minutes, so the time on charge is less than one hour each day. Substitution of Leclanché lithium-ion batteries increases operating time and efficiency, reduces maintenance costs and increases the longevity of the system. Since the LTO batteries charge so quickly, discharged batteries do not need to be replaced with fresh ones while they are recharged, eliminating the need for a maintenance area where batteries are removed and recharged. In Q416 a globally renowned toy and entertainment company headquartered in Denmark replaced its fleet of 27 battery-powered warehouse AGVs with Leclanché's LTO-based solutions. Leclanché was chosen over competitive solutions because it offered the lowest total cost of ownership since it was able to guarantee 80% residual capacity after seven years. The group has initiated discussions with several equipment manufacturers and has a distinct competitive advantage in being able to offer both LTO and G-NMC technology.

Off-grid residential storage

Leclanché offers a range of off-the-shelf energy storage systems for homes and small businesses. These are offered for use with solar panels, storing surplus energy generated during the day for use in the evening and at night. They are designed to last up to 15 years. Leclanché estimates that consumers can generate up to 80% of their own power in this way. Since this sector is highly competitive, with global majors such as Tesla offering systems, Leclanché has decided to focus on the Swiss market, where the requirement for a three phase variant gives it an advantage. Leclanché has launched a 4MWh standardised system. It has received two orders for this already. The system is based on technology developed for BESSs on the island of Graciosa and the École polytechnique fédérale de Lausanne.

Portable

Leclanché continues to sell customised battery packs for mission-critical applications such as powering miniature submarines or communications equipment for armed forces. For example, during FY16 and H117 it worked on two contracts totalling CHF5m to develop Ni-Mh batteries used to power radio communications equipment for the Swiss army. While the group has generally moved away from supplying systems for low-volume applications, it continues to address these niche areas because the work is high margin.

Financial performance

Segmental revenues doubled during H117 to CHF3.1m as Leclanché completed the development projects for the Swiss army. EBITDA losses halved from CHF1.7m to CHF0.6m as a result of the cost-reduction exercise referred to earlier combined with higher revenues. Management expects revenues from the Swiss army to continue at around FY16 levels during the forecast period. This is expected to be supplemented by revenues from the material handling segment and sales of the new energy storage system suitable for individual homes. These initiatives are expected to result in an increase in segmental revenues from CHF6.0m in FY17e to CHF17.0m in FY19e. We model segmental gross margin at 22% throughout the forecast period, with revenues to the defence vertical helping offset any potential pricing pressure.

Energy efficiency solutions (H117 revenue CHF1.2m, EBITDA loss CHF0.1m)

This segment relates to the distribution of smaller format batteries for commercial applications, which are manufactured by third parties in Asia and sold in Europe under brand names registered by Leclanché.

Financial performance

Segmental revenues decreased by 13% year-on-year and EBITA losses halved as the business focussed on more profitable lines. Leclanché is currently engaged in initiatives that will expand both the portfolio of third-party batteries it offers and the sales channels. Management expects that these will deliver segmental growth throughout the forecast period. We model a rise from CHF2.1m revenues in FY17e to CHF5.0m in FY19e. We model gross margin from this activity at 20%, in line with management guidance, throughout the forecast period as the Swiss consumer segment has historically shown little evidence of pricing pressure.

Competitive environment

Shift to system integration changes the rules of engagement

Leclanché is a relatively small player with regards to megawatt hour capacity of batteries shipped annually. It has a global share of less than 3% (based on FY16 deliveries) compared with BYD's 26%, LG Chem's 19% and Samsung SDI's 14% (source: Bloomberg New Energy Finance). However, management's decision to become a vertically integrated group able to provide complete battery energy storage systems for utility-scale grid management and electric vehicles shifts Leclanché away from competing with larger battery manufactures with much better purchasing power, to competing with system integrators on providing complete turnkey solutions for customers.

Exhibit 5: Competitive matrix

	Battery technology manufacturer	Power conversion manufacturer	Software and controls vendor	Project developer	Systems integrator and EPC	Operator and maintenance provider	Financier	Installations
Leclanché	*		*	*	*	*	*	30MWh+
ABB		*			*	*		5MW+
AES Energy Storage			*	*	*	*	*	144MW+
Doosan Grid Technology			*	*	*	*		Not known
GE Energy Storage			*	*	*	*		Not known
Greensmith			*	*	*	*		130MW+
LG CNS	*	*	*	*	*	*	*	85MW
	(LG Chem) (LG Electronics)							
NEC Energy Solutions	*		*	*	*	*		120MW+
RES			*	*	*	*	*	90MWh+
S&C Electric		*	*	*	*	*		76MW
Siemens		*	*	*	*	*	*	Not known
Tesla	*	*	*	*	*	*		380MW+
Yunicos			*	*	*	*		150MW

Source: Edison Investment Research

Of the three largest battery manufacturers, only LG Chem can be regarded as providing an integrated offer, and that is only by counting other parts of the LG empire as working together to provide systems. For the three large industrial groups active in the sector (ABB, GE and Siemens), BESS is not a priority; for example, GE's Energy Storage operation has been folded into its "Current" business and the group lacks the flexibility in pricing to work on smaller, rapidly evolving projects. Dedicated storage system integrators Greensmith and Yunicos are not able to bring in a partner to provide project financing for larger developments.

Battery technology still an important differentiator

Neither the three dominant battery manufacturers nor any of the systems integrators listed above have the same range of battery technologies as Leclanché, which is able to deploy both LTO cells (which is a patented technology) and G-NMC cells. Having the two cell technologies is important because it enables Leclanché to optimise battery choice according to the application. LTO based systems are safer and longer-lasting than other lithium ion battery types and can charge and discharge much more rapidly, so are able to deliver a short burst of power when required. They are preferred for electric buses and ferries, where it is important to be able to accelerate quickly, and for hybrid power systems, where batteries must step in quickly to provide a back-up supply. Of the larger battery manufacturers, only Toshiba has LTO capability. Leclanché's other battery technology, G-NMC, charges and discharges more slowly than LTO, but can store more charge in the same space so is less expensive per watt. G-NMC is preferred for the systems that maintain grid stability by storing surplus power generated from renewable sources until it is needed. Of the larger battery manufacturers, only Samsung offers G-NMC technology. LG Chem has G-LMO technology, BYD has G-LFP, and Tesla has G-NCA technology. An analysis by VTT Technical Research Facility of Finland notes that G-LMO costs the same as G-NMC technology, stores a similar amount of energy and charges and discharges as quickly but does not last as long; G-LFP does not store as much energy or charge and discharge as quickly as G-NMC but is less expensive, and while G-NCA stores most energy of the five technologies studied, charges and discharges at a similar rate to G-NMC and costs the same as G-LFP, it scores least with regards to safety and lifetime.

Management

Leclanché's repositioning is being masterminded by CEO Anil Srivastava, who joined the company in June 2014. He was a director of Oakridge Inc., formerly one of Leclanché's major shareholders, from February 2014 to July 2014. Prior to that, he held a number of executive positions in the renewables industry, including serving as chief executive of Areva Renewables. He was joined in February 2016 by CFO Hubert Angleys, who previously served as CFO and then CEO of the Swiss precious metal refining group Metalor. In September 2017, three new non-executive directors joined the board: Pierre-Alain Graf, former CEO of Swissgrid AG, who is currently also a non-executive director of Landis & Gyr; and Tianyi Fan and Cathy Wang, both from major shareholder Golden Partner. This new blood complements longstanding technical members of the management team. The Chief Technology and Industrial Officer Pierre Blanc, who is an expert on battery cell technology and cell manufacturing, joined the company in 2000. Fabrizio Marzolini, executive vice president system engineering and integration, who is an expert in the electronics and software required to deploy batteries in a complete system, joined in 1994.

Sensitivities

The key sensitivities as we see them are:

- Execution of the larger projects in the pipeline is dependent on Leclanché securing the finance needed. An estimated CHF8m in revenues from the large Canadian project were delayed from FY16 to FY17 because of insufficient financing and there were further delays during H117 and into H217. In February, management noted that it expected around 85MWh of deliveries during FY17. Our estimates model around 19MWh of deliveries.
- The sales pipeline is currently dominated by a small number of large projects. For example, in FY16 three customers, all in the utility-scale and microgrid segment, accounted for 72% of revenues. In 2015 a single customer in this segment accounted for 55%. This customer

concentration has a detrimental impact on revenues if there are any delays in execution. Dependence on any one customer is expected to reduce as Leclanché becomes involved in a larger number of projects.

- Leclanché is currently reliant on third parties for some of the value-added capability. For example, it worked with Deltro Energy for the electrical and civil work for the Canadian project and with Greensmith on the development of the energy management system. Younicos provided much of the engineering, procurement and construction capability for the Graciosa project. While Leclanché is recruiting engineers for installation, commissioning and after-sales support as well as software engineers, its own multi-asset, cloud-based energy management software will not be completed until end FY17. Once the balance sheet issues are resolved, management will be in a position to make acquisitions that will strengthen its ability to develop its own software and to offer engineering, procurement and construction support.
- Leclanché is still in the process of ramping up its production capability. While it has proved that it could support 30MWh of output during FY16, it has not proved that this can be increased to the volumes required to support growth from FY18 onwards. It has consequently not proved that it can manufacture batteries cost-competitively. Should production at an acceptable price-point prove difficult, it is probable that Leclanché would integrate batteries from third parties (see below).
- As battery technology is evolving rapidly, there is a risk that Leclanché's LTO and G-NMC technologies may be overtaken by newer chemistries. In that scenario, Leclanché would integrate the new technology batteries into its energy storage systems. It already has the ability to integrate other battery technologies, supercapacitors or fuel cells if appropriate.

Financials

H117 earnings

Group revenues (including a CHF2.2m EU grant for a ferry project but excluding CHF2.2m insurance income) grew by 40% year-on-year during H117 to CHF8.0m. Revenues benefited from major contracts from the Swiss army received in FY16 and the e-transport related grant. However, the expected ramp-up in growth indicated by the order backlog for large BESS projects was stifled by lack of finance, as during FY16 management secured only CHF3.8m of its CHF30m target equity raise. In addition, Leclanché received CHF2.2m as final settlement of the insurance claim for the fire in the German battery manufacturing facility in FY16. Personnel costs fell by 8% (CHF0.8m) reflecting the restructuring and cost reduction measures taken in late 2016 and early 2017, though other operating expenses grew by 21% (CHF1.0m) because of fees associated with a programme to raise CHF75m corporate and project debt facility, which failed because of the lack of associated equity backing. EBITDA losses narrowed by 26% to CHF9.5m, helped by the income from the government grant and insurance claim. Net finance costs reduced substantially, from CHF1.8m to CHF0.5m, because of lower levels of convertible loans. Losses before tax narrowed by 31% to CHF12.0m.

Exhibit 6: Segmental analysis of revenues

CHFm	FY15	FY16	FY17e	FY18e	FY19e	H116	H117
Utility-scale generation and microgrids	10.7	20.4	14.9	94.5	135.0	2.5	1.4
E-transport	0.9	0.3	2.9*	3.6	28.0	0.3	2.3*
Commercial and industrial battery systems	3.4	4.5	6.0	12.2	17.0	1.6	3.1
Energy efficiency solutions	2.9	2.8	2.1	4.5	5.0	1.4	1.2
Group revenues	17.9	28.1	25.9**	114.7	184.9	5.7	8.0*

Source: Leclanché, Edison Investment Research. Note: *Including CHF2.2m grant. **Excluding CHF2.2m settlement for insurance claim.

H117 cash flow and balance sheet

Cash flow benefited from a CHF2.4m reduction in working capital requirements as work slowed on the large Canadian stationary energy storage project. Capital expenditure totalled CHF1.3m. Capitalised development expenditure was minimal, as engineers focused on revenue generating projects. CHF2.7m cash was provided as a short-term loan to the special purpose vehicles (SPVs) set up to finance the projects in Canada and Chicago. Cash flow benefited from an additional CHF2.2m (net) raised from the sale of equity to Baring Asset Management in April, CHF1.5m from the issue of mandatory convertible loan notes (see Exhibit 7) and a CHF2.7m bridge loan at 12% interest from major shareholder Golden Partner, which has an option to convert it to equity. Cash reduced by CHF3.8m during the period to CHF0.7m at end June 2017. Net debt increased from CHF19.4m at end FY16 to CHF26.3m at end H117, including CHF23.8m convertible loans with a maturity date of 30 June 2017 (see Exhibit 7 for details) and the Golden Partner bridge loan. Net liabilities totalled CHF12.7m.

Financing activity post-period end

Since the end of H117, management has been very active in reducing indebtedness and raising additional finance, giving it the capital resources to continue to convert its order book into revenues and maintain its mid-term growth plan. These financing activities are summarised in Exhibit 7. Our estimates identify a further funding gap of c CHF25m assuming that the full CHF11.0m of the convertible loan note issued in September 2017 are received and subsequently converted. In accordance with Edison policy, we model the remaining funding requirement as satisfied through long-term debt, assigned at group level rather than to individual projects, but note that management's preference is for an equity-based arrangement.

Exhibit 7: Recent financing activity

Transaction	Value	Number of shares
Baring Asset Management – Capital increase	CHF2.2m H117	
Mandatory Convertible Loan Note – Bruellan	CHF 1.0m end H117	Converted to 666,668 shares @ CHF1.50/share
Mandatory Convertible Loan Note – Trialford	CHF0.5m end H117	Converted to 333,334 shares @CHF1.50/share
Convertible Loan – ACE/JADE/LECN	CHF23.8m end H117	CHF12.0m transferred to GP*, converted to 7,333,333 shares @ CHF1.50 Remaining CHF11.8m maturity date extended to 30 June 2018, commitment not to convert before 1 January 2018
Convertible Loan – GP/ACE/JADE	<CHF11.0m Sept 17	New agreement, CHF5.0m received when interims published
Mandatory Convertible Loan Note – GP	CHF12.0m July 2017	Converted to 8,000,000 shares @ CHF1.50/share
Mandatory Convertible Loan Note – Bruellan	CHF3.0m July 2017	Converted to 2,000,00 shares @ CHF1.50/share
Finexis – Placement	CHF3.5m	1,750,001 shares @CHF2.0/share

Source: Edison Investment Research. Note: *Golden Partner.

Estimates

Pipeline

Management notes that the portfolio of projects that have already been awarded or are expected to be awarded for delivery during the remainder of 2017, 2018 and 2019 totals over 450MWh. Around 115MWh of this pipeline relates to firm contracts, which is more than double the deliveries achieved in FY16. Delays in completing financing activities means that a high proportion of the deliveries that management had originally expected to take place during FY17 will now be postponed to FY18.

P&L

Our estimates show FY17 revenues remaining at FY16 levels because of the financing situation. After that, as we assume that the company resolves its funding issues, the year-on-year increase in megawatt hours delivered during FY18 and FY19 converts to strong revenue growth at group level. Edison expects gross margin to improve to 30% during FY18 and remain at that level in FY19 as potential price erosion is balanced by economies of scale realised from higher volume output. We

model FY17 personnel costs at a similar run-rate to H117, with low double-digit growth after that to support revenue growth.

Balance sheet and cash flow

Our model assumes that inventory levels will be kept relatively low during FY17, as most of the battery modules will be purchased from third parties, then increase in FY18 as module manufacture is brought in-house. Our model allocates CHF1.5m for maintenance capital expenditure during FY17, then CHF10.0m in FY18, CHF7m of which is to rebuild the equipment damaged in the fire, and increase battery manufacturing capacity, CHF2m for two module assembly lines and CHF1m to upgrade the ERP (Enterprise Resource Planning) system. The CHF5.5m capex allocated for FY19 includes c CHF2m expanding battery production capacity in Germany and c CHF2m establishing a module assembly line elsewhere, to serve local projects. This model assumes that capital requirements have been reduced by manufacturing some battery cells through a strategic partner in China or India. Noting minimal levels of capitalised IP in FY16 we capitalise only CHF0.1m of IP annually going forward. Our model assumes that the debt associated with financing projects is assigned directly to Leclanché. In practice, each major project may be financed through a special purpose vehicle, in which case the debt would not appear on the group's balance sheet.

Valuation

Exhibit 8: Scenario analysis								
		CAGR	Estimated market size *		Market share in 2020			
			2016	2020	Low	Base case	Mid	High
					1.0%	1.6%	2.0%	5.0%
Utility-scale generation & microgrids	MWh	48%	900	4,200	40	64	80	200
	\$m		1,200	3,700	40	64	80	190
Commercial and industrial systems	MWh	58%	1,800	11,300	100	160	200	600
	\$m		2,300	12,600	130	208	260	630
E-transport	MWh	37%	1,700	6,000	100	160	200	300
	\$m		700	1,800	20	32	40	90
Total	MWh	49%	4,400	21,400	200	320	400	1100
	\$m		4,300	18,100				
Implied Leclanché revenue opportunity	\$m				180	288	360	910
Implied Leclanché revenue opportunity	CHFm				180	288	360	910
Gross margin	%				30%	30%	30%	30%
Raw materials cost	CHFm				(126)	(202)	(252)	(637)
Personnel costs	CHFm				(25)	(29)	(32)	(52)
Other operating costs	CHFm				(14)	(16)	(18)	(29)
Implied Leclanché EBITDA opportunity	CHFm				14	41	58	192

Source: Edison Investment Research. Note: *Data from Navigant report. Conversion rate US\$1.00/CHF.

Leclanché has started to see an increase in revenues from the implementation of its revised strategy, but this has not yet generated operating profits, which limits the use of peer-based multiples as a valuation methodology. Moreover, while management has good visibility of projects totalling c 1.4GWh of capacity, there remains considerable uncertainty as to how quickly it will be able to deliver on the projects. Given this level of uncertainty, we present a scenario analysis that explores potential revenues in each of the three growth markets and the profit that may be generated at group level. Our base case adopts the rate of revenue growth and costs as shown in our estimates from 2017 to 2019, giving a share across the three segments in 2019 of 1.4%. It assumes that revenues grow by the same rate in 2020 as 2019, ie at around 60%, giving a market share of 1.6%. This is predicated on completing the ongoing financing round in a timely fashion. If Leclanché was able to double revenues between 2019 and 2020, market share would be 2% in 2020.

Our indicative valuation takes three of these scenarios (low case 1% market penetration in 2020, base case 1.6% market penetration in 2020 as per the growth rate adopted in our estimates, high case 5% market penetration in 2020) and calculates a DCF out to 2027 for each of the three cases. We assume that a substantial proportion of battery cell manufacture will be carried out by a potential strategic partner, keeping capex at the levels shown in our estimates. As it is likely that the larger projects will be funded through off balance sheet project finance, we assume that the interest for this will be netted off against revenues at the project level. Applying a terminal growth rate of 2% to each case and a WACC that varies according to the level of risk associated with each scenario (ie 13% for 1% market penetration, 15% for the 1.6% market penetration adopted in our estimates and 17% for 5% market penetration) gives an indicative valuation range of CHF2.55-13.96/share, and CHF4.34/share for the rate of growth adopted in our estimates. We have adopted relatively high WACC rates because the fund-raising activity is still ongoing, so there remains uncertainty as to whether this will complete satisfactorily.

The current level of the share price (CHF2.52) suggests that the market is assuming a slower growth rate than that adopted in our estimates and is attributing a substantial discount for risk, including completion of the financing activity. This indicates potential for substantial share price appreciation as Leclanché demonstrates it is able to convert the existing pipeline and achieve the growth rate shown in our estimates.

Exhibit 9: DCF analysis (CHF/share)

Exhibit 10. DCF Analysis (continued)																
		Low case 1% market penetration					Base case 1.6% market penetration					High case 5% market penetration				
		Discount rate					Discount rate					Discount rate				
		11.0%	13.0%	15.0%			13.0%	15.0%	17.0%			15.0%	17.0%	19.0%		
Term growth	0.0%	2.90	2.28	1.85			0.0%	4.97	4.03	3.33			0.0%	14.77	12.89	11.30
	1.0%	3.10	2.41	1.92			1.0%	5.20	4.17	3.43			1.0%	15.35	13.38	11.72
	2.0%	3.34	2.55	2.01			2.0%	5.47	4.34	3.54			2.0%	16.04	13.96	12.21
	3.0%	3.64	2.72	2.12			3.0%	5.80	4.54	3.66			3.0%	16.86	14.66	12.79
	4.0%	4.03	2.93	2.24			4.0%	6.20	4.77	3.81			4.0%	17.87	15.51	13.51

Source: Edison Investment Research

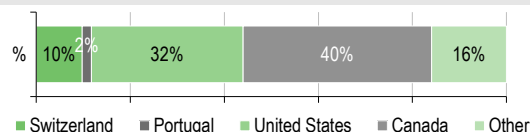
Exhibit 10: Financial summary

	CHFm	2015	2016	2017e	2018e	2019e
Year-end Dec						
PROFIT & LOSS						
Revenue		17.9	28.1	28.1	114.7	184.9
Cost of Sales		(16.6)	(26.2)	(23.0)	(80.3)	(129.4)
Gross Profit		1.3	1.9	5.2	34.4	55.5
EBITDA		(26.0)	(26.6)	(18.4)	1.4	17.1
Operating Profit (pre amort. of acq intangibles & SBP)		(30.2)	(32.7)	(21.4)	(1.5)	13.8
Amortisation of acquired intangibles		0.0	0.0	0.0	0.0	0.0
Share-based payments		(0.1)	(1.0)	(0.7)	(0.7)	(0.7)
Exceptionals		(1.6)	0.0	0.0	0.0	0.0
Operating Profit		(31.8)	(33.7)	(22.1)	(2.2)	13.1
Net Interest		(2.7)	(4.1)	(1.2)	(1.1)	0.0
Profit Before Tax (norm)		(32.9)	(36.8)	(22.6)	(2.6)	13.8
Profit Before Tax (FRS 3)		(34.5)	(37.8)	(23.4)	(3.4)	13.1
Tax		(1.1)	0.6	0.0	0.0	0.0
Profit After Tax (norm)		(34.0)	(36.3)	(22.6)	(2.6)	11.3
Profit After Tax (FRS 3)		(35.6)	(37.2)	(23.4)	(3.4)	13.1
Minority interest		0.0	0.0	0.0	0.0	0.0
Net income (norm)		(34.0)	(36.3)	(22.6)	(2.6)	11.3
Net income (FRS 3)		(35.6)	(37.2)	(23.4)	(3.4)	13.1
Average Number of Shares Outstanding (m)		29.5	42.7	51.5	70.3	75.2
EPS - normalised (CHF)		(1.2)	(0.8)	(0.4)	0.0	0.2
EPS - normalised fully diluted (CHF)		(1.2)	(0.8)	(0.4)	0.0	0.1
EPS - FRS 3 (CHF)		(1.2)	(0.9)	(0.5)	0.0	0.2
Dividend per share (CHF)		0.0	0.0	0.0	0.0	0.0
Gross Margin (%)		7.4	6.8	18.4	30.0	30.0
EBITDA Margin (%)		N/A	N/A	N/A	1.2	9.3
Operating Margin (before GW and except.) (%)		N/A	N/A	N/A	N/A	7.5
BALANCE SHEET						
Fixed Assets		27.7	16.9	15.5	22.7	25.0
Intangible Assets		9.6	6.9	5.6	5.0	4.4
Tangible Assets and Deferred tax assets		18.1	10.0	9.9	17.7	20.6
Current Assets		12.6	35.6	35.5	63.0	86.0
Stocks		4.4	9.6	9.6	31.4	50.7
Debtors		4.7	21.5	9.2	22.0	30.4
Cash		3.5	4.5	16.7	9.6	5.0
Current Liabilities		(13.7)	(46.2)	(32.9)	(22.5)	(34.0)
Creditors including tax, social security and provisions		(12.9)	(23.9)	(11.6)	(18.9)	(30.5)
Short term borrowings		(0.8)	(22.3)	(21.3)	(3.5)	(3.5)
Long Term Liabilities		(18.0)	(11.6)	(11.6)	(36.6)	(36.6)
Long term borrowings		(8.1)	0.0	0.0	(25.0)	(25.0)
Retirement benefit obligation		(8.2)	(9.5)	(9.5)	(9.5)	(9.5)
Other long term liabilities		(1.7)	(2.1)	(2.1)	(2.1)	(2.1)
Net Assets		8.6	(5.3)	6.4	26.6	40.4
Minority interest		0.0	0.0	0.0	0.0	0.0
Shareholders equity		8.6	(5.3)	6.4	26.6	40.4
CASH FLOW						
Operating Cash Flow		(21.6)	(34.2)	(18.5)	(25.9)	1.0
Net Interest		(0.1)	(0.1)	(1.2)	(1.1)	0.0
Tax		0.0	0.0	0.0	0.0	0.0
Investment activities		(4.5)	1.6	(1.6)	(10.1)	(5.6)
Acquisitions/disposals		0.0	0.0	0.0	0.0	0.0
Equity financing and other financing activities		5.3	3.9	22.4	0.0	0.0
Dividends		0.0	0.0	0.0	0.0	0.0
Net Cash Flow		(20.9)	(28.7)	1.1	(37.1)	(4.6)
Opening net debt/(cash)		5.7	5.3	17.8	4.6	19.0
HP finance leases initiated		0.0	0.0	0.0	0.0	0.0
Other***		(21.4)	(16.2)	(12.0)	(22.8)	0.0
Closing net debt/(cash)		5.3	17.8	4.6	19.0	23.5

Source: Edison Investment Research, Leclanché accounts. Note: *Assuming all outstanding convertible loan notes as shown in Exhibit 7 convert to equity end June 2018. **Capex, purchase of intangibles and investment in other financial assets. ***Other relates to convertible notes movements

Contact details

Leclanché SA
Avenue des Sports 42
CH – 1400 Yverdon-Les-Bains
Switzerland
+41 24 424 65 00
www.leclanche.com

Revenue by geography (FY16)

Management team
Chief Executive Officer: Anil Srivastava

Mr Srivastava joined Leclanché as CEO in June 2014. He was CEO of Areva Renewables between January 2009 and December 2011. Before joining Leclanché he was CEO of a large offshore wind business in Germany, then a director at Oakridge, which used to be a major investor in Leclanché. Prior to working at Areva he held senior executive positions in TomTom Group and Alcatel-Lucent.

Chief Financial Officer: Hubert Angleys

Mr Angleys joined Leclanché as CFO in February 2016. He was CEO of Swiss precious metal refining group Metalor until August 2014, after holding the chief financial officer position for 12 months. Prior to joining Metalor, he held various financial director positions including ALCOA Europe and SIPCA Group.

Chief Technology Officer and Industrial Officer: Pierre Blanc

Mr Blanc joined the company in 2000. His previous roles include development manager of primary cells and head of the R&D department. He started work at Leclanché as a chemical engineer, responsible for the development and manufacturing of battery cells.

Executive VP System Engineering and Integration: Fabrizio Marzolini

Mr Marzolini joined Leclanché in 1994. He is responsible for the development of battery solutions including battery management software and electronics.

Principal shareholders

	(%)
Golden Partner Group	45.4
Bruellan Corporate Action Governance Fund	11.7
Logistable Group	4.3
ACE Group	3.6
Baring Asset Management	3.3

Companies named in this report

General Electric Co. (GE:US); NEC Corporation (6701:JP); Siemens (SIE:GR)

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