paragon

Company outlook

It's electrifying

Automobiles & parts

paragon's continued strong growth is driven by the Electromobility division (Voltabox) and the smaller Mechanics division. With the Electronics division transitioning to a new generation of products that should return the division to double-digit growth in the medium term, paragon remains a high-growth technology innovator. Following the flotation of Voltabox in Q417 and the recent change of legal structure, paragon's rating appears to have undergone an unwarranted decline. Our capped DCF value stands at €98 per share.

Year end	Revenue (€m)	PBT* (€m)	EPS* (€)	DPS (€)	P/E (x)	Yield (%)
12/16	102.8	6.9	1.02	0.25	42.9	0.6
12/17	124.8	8.2	0.67	0.25	65.3	0.6
12/18e	178.5	15.4	2.08	0.25	20.9	0.6
12/19e	251.2	25.7	3.24	0.25	13.4	0.6

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

Electromobility a dynamic growth story

Voltabox is expected to more than double revenues to €60m and deliver a double-digit margin in 2018 as it starts to execute its €1.0bn lifetime order backlog. With the proposed acquisition of Navitas Systems in the US for $43m, Voltabox will add lithium ion battery cell production for the first time. In conjunction with the new power components being launched by Voltamotion from the Aachen site, it positions Voltabox to cover every stage of the e-mobility supply chain from cells to drives. The addressable market for Voltabox is expected to grow from c $3bn in 2018 to c $80bn in 2025, a combination of strong organic growth and development of new adjacencies and extension of the product portfolio.

Strong prospects for other divisions

The Electronics division continues to transition to new generations of products, notably in the Sensors subsegment. However, the recent large order from Geely Auto in China for DUSTDETECT particle sensors is an indication that efforts to internationalise and diversify the customer base are starting to bear fruit. It also shows the innovative and proactive response to identified global megatrends such as urbanisation and pollution is providing traction for the division, underpinning future growth. New product introductions in Cockpit and Audio should also drive growth. Having integrated its largest competitor to create the clear global leader in adjustable body components, paragon movasys, the Mechanics operations should also benefit from volume ramp-ups from new product introductions.

Valuation: Implied valuation appears undemanding

Voltabox is now directly valued by the market and while that valuation can be debated in isolation, it implies a valuation of the remainder of paragon. Currently, the implication appears undemanding, with the ex-Voltabox element of paragon trading on just 1.6x FY18e EV/EBITDA. Given the expected strong growth across all divisions, the very positive market outlook for Voltabox, and our DCF value of €98 per share, there would appear to be potential for an upwards re-rating.

2 August 2018

Price	**€43.5**
Market cap	**€197m**

Net cash (€m) at 31 March 2018	63.3
Shares in issue	4.5m
Free float	50%
Code	PGN
Primary exchange	Frankfurt (Xetra)
Secondary exchange	N/A

Share price performance

%	1m	3m	12m
Abs	(6.7)	(14.5)	(26.3)
Rel (local)	(10.4)	(15.4)	(29.1)
52-week high/low		€94.00	€40.60

Business description

paragon designs and manufactures automotive electronics and solutions, selling directly to OEMs. Products include sensors, acoustics, cockpits and body kinematics. Production facilities are in Germany, the US and China. Following the IPO in October 2017, paragon owns 60% of Voltabox.

Next events

H118 results	21 August 2018

Analysts

Andy Chambers +44 (0)20 3077 5700

Annabel Hewson +44 (0)20 3077 5700

industrials@edisongroup.com

Edison profile page

paragon is a research client of Edison Investment Research Limited

Investment summary

Company description: Thinking outside the box

paragon is a tier 1 automotive component and electronics supplier founded in 1988 by the CEO Klaus Dieter Frers. However, unlike traditional automotive suppliers paragon employs a team of engineers to develop innovative solutions that lead customers to adoption. It is based in Delbruck, Germany but also has subsidiary operations located in the US and China. In FY17 Germany accounted for 72% of revenues primarily to automotive OEMs, with 23% sold in the rest of Europe and 4% from other regions. Following a reorganisation in 2017 it operates through three divisions; Electronics (73% of FY17 revenues), Electromobility (20%) and Mechanics (8%). On 13 October 2017 the company successfully floated 39.97% of the rapidly growing Electromobility segment, named Voltabox, on the Frankfurt Stock Exchange (in the Prime Standard segment) in a €475m IPO. In Q218 the company changed its legal structure to maintain the current growth strategy and strengthen access to capital markets.

Legal structure change should support growth strategy

The change of legal structure to that of a KGaA, a partnership limited by shares, ensures the continued involvement of the founder with the development, strategy and management of the group. In addition, it should provide greater flexibility in raising funds through the capital markets especially if it leads to the inclusion of paragon in DAX Indices in the future. While the structure may appear somewhat retrograde in UK corporate governance terms, it is a common structure in Germany with Hella and Fresenius examples of KGaA corporate structures. It should remove the potential financial constraints under the previous structure, enabling investment for growth.

Valuation: Potential not adequately reflected

The flotation of Voltabox adds a new dimension to the valuation of paragon. With a market value attributable to a large, rapidly growing and identifiable part of its business, consideration of the nature of paragon's strategy to grow and develop innovative businesses within the Electronics and Mechanics segments comes to the fore. We continue to believe that these parts of paragon should also be rated as high growth, technology-rich automotive suppliers. We expect EPS to double between 2018 and 2020. While the initial euphoria of the floatation has dissipated, our DCF valuation for the group highlights its potential and currently stands at €98 per share. Taking an average of this and our composite peer group value of €66, provides a fair value of €82 per share.

Financials: Executing a growing backlog

The rate of growth at the company continues to be dynamic, despite the transition of the sensors business in electronics to a new generation of products as more mature, higher-margin product lines come to the end of their lifecycle. Guidance from the company for 40% top-line growth is driven primarily by growth of Electromobility and Mechanics, with the latter benefiting from the addition of HS Genion for a full year. Electromobility (Voltabox) is expected to more than double revenues to €60m, generating a 10% EBIT margin, while Mechanics (movasys) is at a slightly below group average EBIT margin. Overall, the group guidance for FY18 is for €175m of revenues with a c 9% EBIT margin and investment of around €35m. Looking further ahead, the Electronics segment is expected to see renewed growth in 2019 as the lifecycle transition effects a move to a more favourable phase. As the benefits of the highly automated production support the increased volumes, we expect EBIT margins to progressively expand towards 12%, which we were previously anticipating. Sales are likely to be some 15-20% higher than we expected a year ago, largely due to the rapid expansion of Voltabox volumes as it executes its substantial order backlog.

Company description: Technology innovator

paragon was established by founder and major shareholder, Klaus Dieter Frers in March 1988. It was originally an industrial electronics subcontract manufacturer, but subsequently focused on automotive electronics and systems supply and moved into adjacent markets. It has consistently used its engineering capabilities to identify trends ahead of the OEMs and provide innovative solutions to address them. The organic growth strategy has been supplemented by acquisitions. The addition of HS Genion in December 2017 is another example, providing a path to it becoming the clear leader in body kinematics systems. The purchase of Concurrent Design in April 2018 adds technical expertise to enhance Voltabox’s development capacities, while the Navitas acquisition should profitably extend the value chain towards highly customised battery cell production.

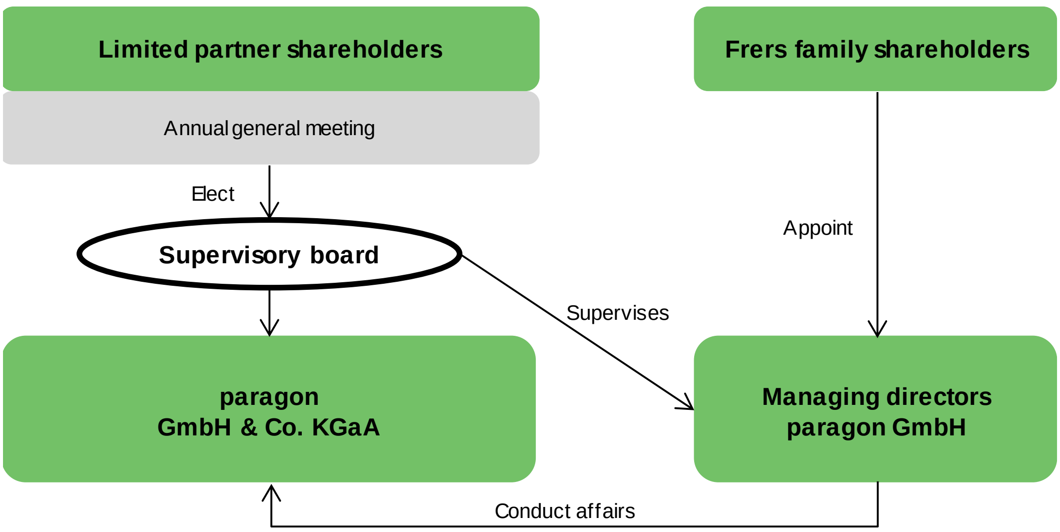
Change of corporate legal structure to a KGaA

The company has changed its legal structure to that of a KGaA, a partnership limited by shares. In this structure the company is composed of a general partner and limited liability shareholders. It is a fairly common structure in Germany with companies such as Hella and Fresenius examples of listed entities operating under KGaA structures.

The KGaA structure consists of a general partner to manage the business, which would be paragon GmbH, 100%-owned by the Frers family with managing directors appointed by them. The limited liability shareholders would elect the supervisory board of paragon Gmbh & Co. KGaA at annual general meetings, who would also provide oversight of paragon Gmbh. It is a popular corporate structure with family-controlled entities in Germany, such as paragon, as it maintains effective control while increasing access to capital markets.

Essentially it should mean that paragon can raise funds to pursue its growth strategy without the family necessarily taking up its full pre-emption rights in future capital raisings. To maintain control under the previous structure, pre-emption fulfilment by the Frers family would have been required, meaning it was a potential constraint to investment decisions being progressed. In turn, the ability to raise additional funds without full subscription by the Frers family could increase the free float of paragon shares and allow them to be included in DAX indices in the future, further increasing the attractiveness of the stock to certain funds.

Exhibit 1: KGaA structure



Source: paragon

The advantages of the change in structure include:

- Continue the growth strategy and preserve the family-owned culture of the business.
- Maintenance of the management involvement and strategic input from the founder.
- Greater access to capital markets, removing a potential conflict of interest if the Frers family decides not to participate in future fundraisings to support growth initiatives.

Disadvantages are:

- More limited shareholder ability to influence the management of the company, especially if non exercise of pre-emption rights in future capital raising were to occur.
- Removal of potential speculative factors. Any change in ownership would need to be approved by the managing entity.

On balance the company believes the positives outweigh the negatives for shareholders, as the ability to grow the company is enhanced for the benefit of the family and shareholders alike.

Following ratification at the AGM on 5 May 2018, the conversion to the new KGaA structure was completed on 5 July 2018. The founder, Klaus Dieter Frers is chairman of the board of the general partner company, paragon GmbH. Other board members are Dr Stefan Schwehr the chief technology officer (CTO) and the new head of automotive operations Dr Matthias Schöllmann, who has been appointed from 1 September 2018. He was previously at Hella, another family KGaA. Mr Christian Johansson joined from Webasto as the new head of finance on 1 July 2018.

Company operating structure

Since a reorganisation at the start of 2017, the group has been operating under three divisions Electronics (sensors, cockpits and acoustic), Electromobility (Voltabox; battery modules and management systems) and Mechanics (body kinematics; now renamed movasys following the HS Genion integration). These are supported by the central manufacturing organisation, productronic, which provides economies of scale in manufacturing and is charged to the divisions depending on utilisation. The Electromobility division, which consists of Voltabox, was part floated in October 2017 via the listing of 39.97% of its shares on the Frankfurt Stock Exchange.

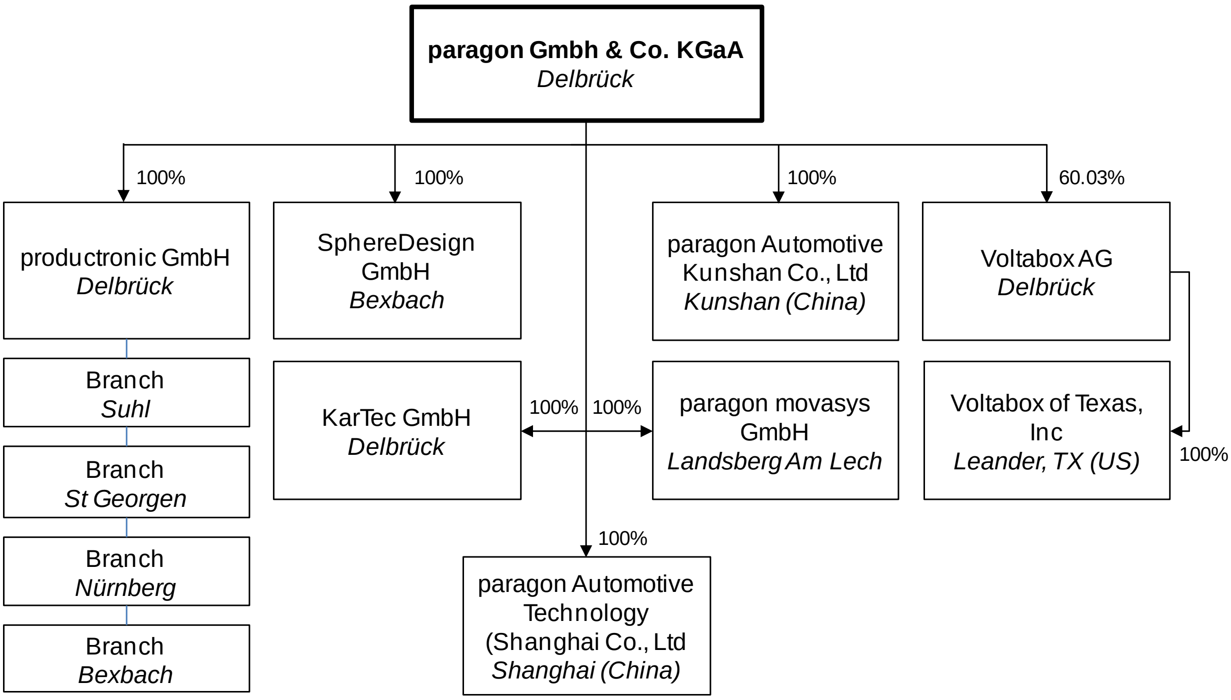
Exhibit 2: paragon divisional structure and product portfolio

	Electronics (72.7%)			Electromobility (19.8%)	Mechanics (7.5%)
2017 revs	€90.8m			€24.7m	€9.33m
Products	*SENSORS €33.8m* **Solutions for improving air quality within the vehicle cabin:** • Air Quality Sensor (AQS), Conditioner (AQC) and Improver (AQI) • CO_2 Sensor • PM 2.5 Particle Sensor • Fragrance System **Solutions for optimising drivetrain control systems:** • Position sensors • All gear sensors • Start-stop sensors • 3-D Sensor • Gear lever sensors	*ACOUSTICS €35.7m* **Products designed to ensure the transmission of speech without loss of quality:** • Microphones for use with hands free kits or noise sensing • Integrated seatbelt microphone: belt-mic	*COCKPIT €21.4m* **Broad portfolio of products designed for the cockpit:** • Media interfaces • Wireless Charging phone trays • cTablet Docking Station • MirrorPilot: head unit-platform for entry and mid-market vehicles • Control systems • Display instruments: analogue and digital • Stepper motors • Reversing camera system	**Li-Ion battery packs marketed through two subsidiaries: Voltabox Deutschland (Germany) and Voltabox Texas (US) serving various markets:** • Buses (electric, hybrid, trolley) • Intralogistics (fork lifts, AGV) • Starter batteries (cars, bikes, scooters, military) • Traction batteries (scooters) • Power generators (military) • Stationary systems (grid levelling, solar back-up)	*KINEMATICS* **Innovative technical solutions for the efficiency and comfort of the moving parts of the automobile body:** • Steering column paddle shifters • Aerodynamics: spoiler, windshield deflector and cooling louvre systems • Convertible-top systems: rear side flaps and wind deflectors *PRODUCTRONIC* Responsible for all manufacturing processes within the group
Main Competitors	• ams AG • Auto Industrial Co., Ltd • SGX (Amphenol Ltd)	• AKG Acoustics GmbH • BURY GmbH & Co KG • peiker acustic GmbH & Co KG (Valeo S.A.)	• Continental AG • Laird Technologies, Inc • Visteon Corporation	• ACTIA I+ME GmbH • FORSEE Power SAS • Impact Clean Power Technology S.A	• HS Genion GmbH (Augenio AG) • Magna Car Top Systems GmbH • Suspa GmbH

Source: paragon, Edison Investment Research paragon's philosophy of highly automated, centralised manufacturing of products designed for ease of production provides a competitive advantage over many of its peers. The competitive landscape is fragmented, with few peers operating across more than a couple of paragon's product lines.

As a result of the recent corporate adjustments the current group structure is shown in Exhibit 3.

Exhibit 3: Current corporate structure



Source: paragon

Strategy to PUSH into a new era

paragon is evolving its strategy under an initiative known as PUSH 2018:

- P – paragon's identity provides culture of change
- U – understand global disruption of the supply chain
- S – shape future car trends
- H – hub for innovation

It is a natural development of the strategy of utilising paragon's core competences in technological innovation and engineering resource to identify global megatrends affecting the automotive market, and provide solutions to improve the driving experience of passenger cars. Using the push principle, products are only presented to OEM customers once prototypes are developed and patents filed, providing significant IP protection. It also differentiates paragon from many of its automotive supply peers who tend to be reactive to OEM requirements. It enables paragon to dominate key product niches in the premium segments, with competitiveness maintained through the investment in cost-efficiency and increasing M&A integration scale.

The approach maintains the philosophy instilled by the founder and CEO since the company was formed in 1988. The agility and entrepreneurial nature of the business has allowed it to grow through product development, increased market penetration, development of new markets and diversification into new submarkets. The resultant emergence of Electromobility and Mechanics as high-growth segments are clear outcomes from the strategy.

In addition, the development of increasingly sophisticated products is enabling improved sales prices per product, with an average increase in 2017 of 16%, or 25% since 2015. The trend is important as the electronics product portfolio transitions from one generation to the next.

Global megatrends driving innovation

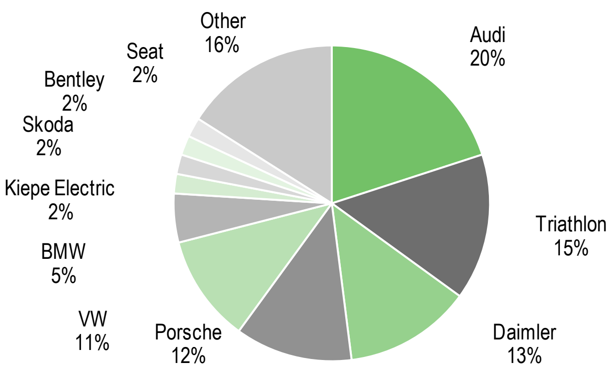
The global megatrends that paragon considers relevant to its strategic development remain consistent. These are

- **Urbanisation** – causing increased air pollution and the requirement for shared mobility. These are driving requirements for air quality solutions and comfort products such as infotainment systems in autonomous vehicles.
- **Digitalisation** – autonomous driving requires mandatory driver monitoring and contactless evaluation of vital data. Improved connectivity and control systems including wireless charging, and high performance in car communication and sound systems are also important drivers.
- **Carbon reduction** – drives more efficient vehicles to improve and optimise fuel efficiency including reduced drag with adaptable components, as well as the move to increasing electrification of vehicle motive power sources and drivetrains.
- **Increasing comfort** – the provision of more convenient interaction with vehicles including instrument displays as well as gesture, tough and voice recognition control systems

Continuing to diversify the customer base

paragon's strategy has enabled it to remain a leading Tier 1 partner of its Electronics segment's historic customer base of premium automotive OEMs in Germany. Since opening the Chinese production facility of paragon Automotive Zunshan in 2015, several Chinese automotive OEMs have been added to the customer roster, and provide an opportunity for increased sales of certain products in the future. Similarly, products are expected to be adopted by US manufacturers as they respond to European quality. The growth of Electromobility also extends paragon's international footprint, as it develops new end-market subsegments such as intralogistics (forklift trucks and automated guided vehicles), trolley buses, mining equipment, agricultural vehicles and motorcycles.

Exhibit 4: paragon customer mix FY17



Source: paragon

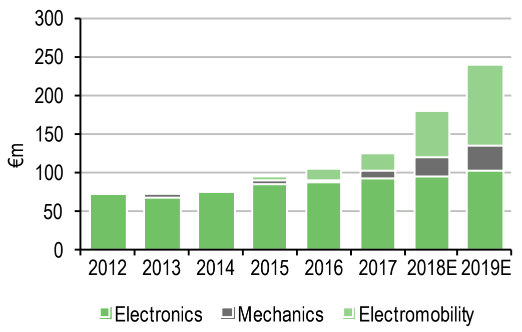
The proportion of sales derived from the top premium German automakers (VW Group, Daimler and BMW) continues to decline, and we expect it to reduce from c 70% in FY17 to around 55% in FY18 largely due to the strong growth of Voltabox, which is forecast by management to account for more than a third of revenues this year.

Divisional overview

Executing a healthy and rapidly growing lifetime order book

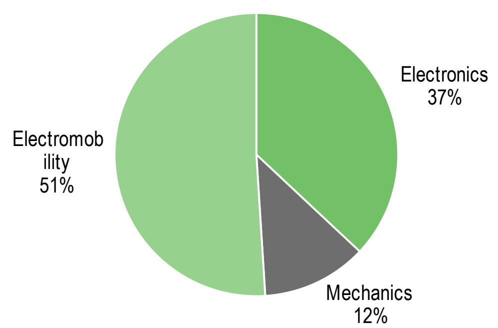
At the end of Q118 the group had a lifetime order backlog of €1.96bn, weighted for the expected contract lifetime and the probability of occurrence, which is equivalent to more than 10x anticipated FY18 revenues. Of this, over 68% is subject to signed contract or framework agreements.

Exhibit 5: paragon revenue development by division



Source: paragon

Exhibit 6: paragon lifetime order backlog by division – total €1.96bn (Q118)



Source: paragon

Electromobility growing to supply an electric world

The Electromobility operations of paragon consist of Voltabox's operations based in Germany with a US subsidiary operation in Texas. The businesses supply advanced, modular, rechargeable, lithium ion battery systems. These consist of stacked lithium ion cells providing system voltages ranging from 12V to 1000V, with an energy content ranging from 120Wh to 1.6MWh.

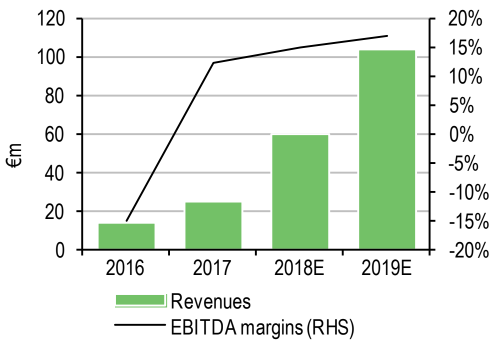
The expected market dynamics for Voltabox are very encouraging. As the world electrifies, Voltabox expects the global battery market to increase in value from $59bn in 2018 to $160bn in 2025. Current end-market segments addressed by Voltabox of around $2bn are expected to grow at around 11% per year over the period but direct adjacent markets that are to be entered increase the 2018 addressable market by c $20bn. Together with potential new market segments, this increases the overall addressable market to around $25bn this year. The total addressable market is expected to be around 50% of the global battery market by 2025, or c $80bn.

Voltabox's operations are divided into three business segments:

- **Voltapower** is the core activity which designs**,** manufactures and distributes the high performance battery systems for large specialised vehicles to four major segments: public transportation (trolleybuses), intralogistics (forklifts and automated guided vehicles, AGVs), mining equipment, and agricultural/construction vehicles. Voltabox is able to cost-effectively design and customise solutions specific to customer applications and uses.
- **Voltaforce** develops, manufactures and distributes standardised low voltage batteries providing smaller, lighter battery pack with a longer service life and improved performance against lead acid batteries. Applications include starter batteries for motorcycles, motor sports and 48V battery packs for mild-hybrid vehicle applications. Shipments of motorcycle batteries to BMW are ramping up at Delbruck, with deliveries starting in Q317.
- Under the brand name **Voltamotion**, Voltabox has been developing a range of drivetrain components, including power electronics, at its new R&D site in Aachen to enable full electrification of vehicles. Products include inverters, chargers and DC/DC converters, which are progressively being introduced to the market from FY18.

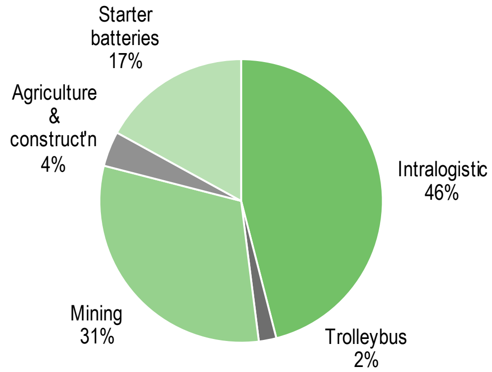
Electromobility has been and is expected to remain the largest contributor to paragon's profits growth over the forecast period.

Exhibit 7: Electromobility revenues and EBITDA margin



Source: paragon

Exhibit 8: Electromobility lifetime order backlog by end market (€1.0bn Q118)



Source: paragon

Voltabox's success is reflected in its burgeoning lifetime order backlog and the rapid growth of its revenues as it continues to build advanced manufacturing capacity to fulfil these orders. Its major customers are Kiepe Electric (trolleybuses), Triathlon Batterien (intralogistics – forklift batteries) Komatsu (formerly Joy Global mining vehicles), KUKA (intralogistics – robotic AGVs) and BMW Motorrad (motorcycles). The backlog by end-market at 31 March 2018 is shown in Exhibit 8.

Acquisitions adding capability

The IPO left Voltabox with a strong balance sheet, raising net proceeds of c €140m for the company. A total of €16m was earmarked for repayment of a loan to the parent and €25m was intended for a ramp up in R&D capabilities and investment in associated facilities, including in China. The balance was available for strategic M&A and Voltabox has already started to execute this element of its strategy. At the end of Q118, net cash stood at €91m on its balance sheet.

In April 2018 Voltabox announced the extension of its engineering capability in the US through the acquisition of Concurrent Design Inc based in Austin, Texas, for €2.6m. With more than 20 design and software engineering specialists, the purchase will bolster Voltapower's R&D capability, extending the ability to develop platform solutions to more than one at a time and potentially further accelerating growth from 2019.

On 29 June 2018 Voltabox announced an agreement to acquire Navitas Systems of Woodridge, Illinois, for $43m (€37m) subject to regulatory approvals. The company has around 80 employees and has an R&D and manufacturing facility at Ann Arbor, Michigan. Mainly supplying US customers, Navitas Systems also manufactures lithium-ion battery systems for intralogistics and transportation applications, but adds renewable energy and other applications to the end markets served by Voltabox. It also brings some additional capabilities in highly specialised battery cell development and fabrication, the first exposure of Voltabox to battery cell production. Navitas has revenues of around c $25m and is expanding its annual production capacity for highly customised cells from 600k units to 1.5m. The US market is increasingly adopting lithium ion batteries in areas such as intralogistics as products become increasingly cost-effective due to the total cost of ownership advantage they afford.

Trading performance in Q118

Electromobility's trading performance in Q118 showed strong third-party revenue growth with a 97.5% increase to €5.1m (Q117 €2.6m). Losses for the period were reduced at all levels, including

EBITDA close to break even (Q117 EBITDA loss €0.7m), an EBIT loss of €0.8m (Q117 loss €1.0m) and a net loss of €0.9m (Q117 net loss €1.3m).

Financial guidance

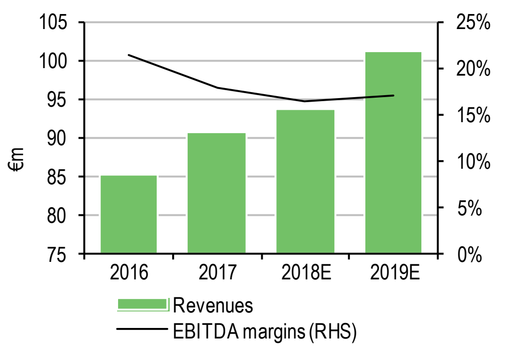
In FY18 paragon indicated that the Electromobility segment is expected to increase revenues to €60m, generating an EBIT margin of around 10%. In addition the Voltabox prospectus indicated that revenues would be expected to grow to €100m in FY19. This was based on an order backlog at June 2017 of €805m extending forward five years, which subsequently grew organically to c €1.0bn at the end of Q118. Of the current backlog, 77% is underpinned by signed framework contracts.

Electronics in transitional phase

Despite the strong growth in Electromobility, the Electronics division continues to be the largest segment of paragon, accounting for 73% of group external sales. It offers a broad portfolio of sensors, microphones and cockpit instruments to its customer base, which is comprised primarily of the premium German automotive manufacturers. The top customers include Audi, BMW, Mercedes Benz, Porsche and Volkswagen, but paragon expects to be able to grow its presence in Asia and the US as manufacturers adapt to the comfort and quality megatrends driving the European manufacturers.

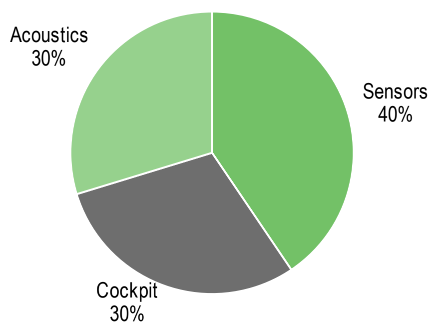
In FY17, Electronics achieved healthy overall revenue growth of 6.5% and generated an EBIT contribution of €9.7m, down from €12.7m in 2016. The performance was achieved despite a transition from the supply of older products to a newer generation of product offerings, with inevitable dilutive effects on revenue growth.

Exhibit 9: Electronics revenues and EBITDA margin



Source: paragon

Exhibit 10: Electronics lifetime order backlog by subsegment (€0.6bn Q118)



Source: paragon

The division operates through three subsegments.

- **Sensors** supplies a range of products aimed at monitoring, conditioning and improving air quality in cars and optimising drivetrain performance of vehicles. In FY17 there was a modest decline in segment revenues largely due to life-cycle effects on older, higher-margin products where production volumes fell, with sales of new-generation sensors on current in-production vehicles continuing to increase. In FY17 this resulted in a 2.4% sales decline for the segment to €33.8m (FY16 €34.6m). As volumes of the newer products increase, we expect to see margins improve, but the transitional effects are expected to continue in FY18. As the transition completes and further new products such as DUSTDETECT particle sensor and DUSTPROTECT particle filters are introduced from 2019, we expected segment growth to increase to double-digit rates. The recent seven-year agreement with Geely Auto Group of China for DUSTDETECT sensors, worth an initial €26m, should start local production in 2020.

- The **Cockpit** designs, manufactures and supplies display instruments, mobile phone charging trays (including wireless) and cradles, infotainment connectivity, controls and stepper motors. The sub-segment saw revenue growth of 5.8% to €35.7m in FY17 (FY16 €33.7m) reflecting increased volumes of new generation instrumentation products for a longstanding customer. While a flatter performance is expected this year as volumes mature, in the longer term developments such as the MirrorPilot smartphone integration system are expected to support additional growth.
- **Acoustics** supplies hands-free and noise measurement microphones, as well as decentralised sound system components and speakers that are networked by a digital bus system providing lightweight and high-quality solutions. There was strong growth of 25.8% in Acoustics revenues to €21.4m (FY16 €17.0m) as sales volumes of the current generation of premium hands-free microphones increased. The focus on hands-free communication and development of 3D in-car audio (ICA) remain key drivers, reducing weight and incorporating new technologies such as automatic road noise cancellation (ARNC) to further improve sound quality.

Trading performance in Q118

In Q118 Electronics third-party revenues fell by 3.9% to €21.7m (Q117 €22.5m), which accounted for 63% of group sales. The decline reflected a modest 1.7% rise in Sensors revenues to €8.7m (Q117 €8.5m), which failed to offset falls of 8.5% in Cockpit to €7.6m (Q117 €8.4m) and 5.1% in Acoustic to €5.3m (Q117 €5.6m). The divisional EBIT fell to €2.1m compared to €2.6m in Q117.

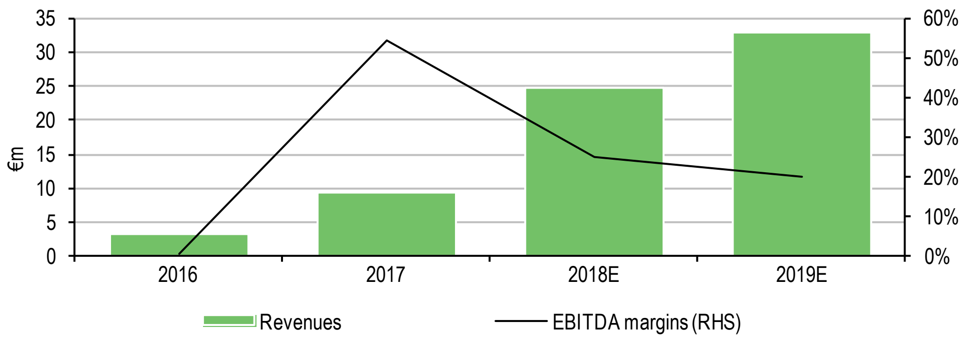
Financial guidance

Management expects the transitional phase in Electronics to continue in FY18, remaining around 9%, with margins by implication from the overall group guidance. We expect an update with the H118 results release as the Navitas deal is expected to complete in Q318.

Mechanics

The Mechanics segment develops, manufactures and supplies adjustable aerodynamic body components such as adaptively extended spoilers, products for convertible car roof deployment and interior systems such as seat cushion adjusters. Lightweight movable body parts help to reduce weight and the drag coefficient of vehicles, in turn lowering fuel consumption and thus CO_2 emissions. Growth for the segment is expected to be stimulated by the environmental megatrend, as applications for adjustable body components driven by motorised controls extend from high performance sports cars to other vehicles types. The trend of vehicle fuel efficiency will remain relevant as the vehicle markets transitions from combustion engines to electric cars. The leading customers for paragon movasys are Audi, Bentley, Mercedes Benz and Porsche.

Exhibit 11: Mechanics revenues and EBITDA margin



Source: paragon, Edison Investment Research estimates

While the division is paragon's smallest, it was the fastest growing in FY17, increasing sales by 188% to €9.3m (FY16 €3.2m). The operation moved into profit, generating an adjusted EBIT of €1.2m compared to a loss of €0.1m in 2016. This excludes €1.4m of start-up costs and increased material costs of prototypes as well as €2.2m of expenses, not yet passed on to customers.

Growth is expected to be substantial in FY18. The improvement is a combination of strong organic development as new generations of spoilers were introduced from Q217 and should ramp up through FY18 and FY19, with profit performance improving as a result. The addition of HS Genion should also contribute significantly. In its one month of consolidation from the beginning of December 2017, it added sales of €1.7m with a net income contribution of €0.7m.

Integration of HS Genion creates global market leader

On 24 November 2017, paragon announced the €15m acquisition of HS Genion based in Landsbech am Lech in Germany. The company was paragon's largest competitor in adaptive vehicle aerodynamic systems. Following the integration with paragon's existing body kinematics activity, the combined operation now operates as paragon movasys. It is the global market leader in adaptive body components, and furthers paragon's strategic aim to become a leading system provider in vehicle aerodynamics. The business has been operating since 1994 and has around 100 employees.

Trading performance in Q118

In Q118 third-party revenues for Mechanics increased substantially to €7.5m (Q117: €0.8m), accounting for 22% of group sales. It reflected both a full contribution from HS Genion as well the ramp-up to series production of several new rear spoiler products during 2017. Divisional EBIT improved to €1.0m (Q117 EBIT loss €0.2m) after charging a €0.4m (Q117: €0.0m) one-off cost for similar items on start-ups and prototyping to those experienced in FY17.

Financial guidance

The Mechanics division is expected to increase both revenues and adjusted EBIT contributions in FY18, excluding one-off costs incurred in FY17. As seen in Q118, the one-off costs may continue in the rest of the first half but we assume guidance excludes these. In addition, HS Genion will make a full year contribution compared to only one month of consolidation in FY17. As a result, management expects the division to grow revenues to around €25–30m in FY18.

Sensitivities centre on changing end markets

As a supplier into the automotive and related markets, paragon's development is linked to global economic growth and automotive market drivers. The group is also influenced by evolving corporate development, as it grows to address adjacent markets.

- **Valuation of Voltabox:** the market capitalisation of paragon is highly correlated to the valuation of Voltabox, which is 60% owned by paragon.
- **Decoupling from direct end-market fortunes**: while paragon will be affected by global economic growth and drivers in the automotive market, there are a number of factors that provide the group with above-market growth potential. These include c 50% exposure to the German premium manufacturers, as well as the increasing revenue per car being won in new systems, which provides a non-linear relationship to underlying automotive volumes.
- **Threat from electric vehicles:** once again, the market positioning of the German premium OEMs is important in this regard. Should they lag behind in the race to electrification and lose their collective global market shares and paragon fails to significantly diversify its clientele, it is

likely to affect the company adversely. While Voltabox's exposure to the fully electric battery electric vehicle market has been limited, the power electronics products now being introduced to the market should help increase presence in the segment and improve customer diversity. The 48V batteries for mild hybrid passenger vehicles are still under development.

- **Automotive cost pressures**: traditional automotive cost pressures and competition exist for the group. It mitigates this through a design for manufacture approach and a high degree of automation, as well as its positioning as a design leader providing value-creating propositions to manufacturers.
- **Technology issues:** while paragon has sufficient firepower to invest in the development of new products (eg biosensors for driver monitoring), there is no guarantee that the new portfolio of products and services will gain significant traction with OEM customers. In addition, new disruptive technologies could appear over the next decade that could transform technologies, for example in batteries. We would expect paragon to remain abreast of developments and adopt these technologies where economically appropriate and available.
- **Expansion to new market segments**: to provide a further balancing of the group's exposure to direct automotive factors, paragon has expanded its reach to adjacent market segments, where similar requirements for high-quality systems engineering exist, notably in Electromobility. The ability of the group to win appropriate contracts to drive performance in these new markets will influence EPS growth over the next three years. This expansion has been enhanced through paragon's relationship with strong partners in each target market, supported by good contract visibility and dedicated, expanding production facilities.
- **Key person issues**: given the high degree of management ownership and reliance on CEO Klaus Dieter Frers, the group is exposed to a high reliance on a small number of key personnel. The appointments of Dr Stefan Schwehr as CTO and Dr Matthias Schöllmann as head of Automotive (as of 1 September 2018) mitigate the risk somewhat and provided increased ability to pursue new product development and market opportunities to grow the group globally. The supervisory board provides an overseeing governance structure of the management partner board under the new KGaA entity.

Valuation: Scepticism provides opportunity

The sharp decline in paragon's share price since highs around the Voltabox IPO in October 2017 appears unwarranted. While the change in corporate structure may have caused some technical selling by shareholders, the value proposition and guidance has remained unchanged since the preliminary results. The decline in the value of Voltabox can only partly explain the reaction.

As a result it would appear that stripping out Voltabox from the group valuation, the market is attributing an extremely low valuation to the remaining businesses of paragon of just 1.6x EV/EBITDA and 2.9x EV/EBIT for FY18e.

Exhibit 12: Market value attributable to paragon without Voltabox (€m)

paragon's stake in Voltabox	60%
Voltabox market value (share price €19.88 at 1 August 2018)	315
Voltabox's market value to paragon (1)	189
paragon's total market value (2) (share price €43.5 at 1 August 2018)	197
Market value attributable to paragon's electronics and mechanics business (2)-(1)	**8**
Net debt to paragon (excluding Voltabox)	28
paragon's EV (excluding Voltabox)	36
paragon's FY18e EV/sales for the electronics and mechanics segment	0.3x
paragon's FY18e EV/EBITDA for the electronics and mechanics segment	1.6x
paragon's FY18e EV/EBIT for the electronics and mechanics segment	2.9x

Source: Bloomberg, Edison Investment Research

While some of this may relate to technical factors surrounding the change of legal entity, we would anticipate these to improve towards the multiples of peers, if not higher, given the growth potential. For FY18 the peers are trading on EV/sales of 0.8x, EV/EBITDA of 6.3x and EV/EBIT of 9.2x. Were the remainder of paragon excluding Voltabox trading on the peer group EV/EBITDA of 6.3x then the overall paragon market cap would be €300m or €66 per share.

Peers' short-term relative rating appears stretched, growth key

As can be seen in Exhibit 13 below, paragon group trades at a significant FY19e EV/EBITDA discount to its nearest listed peers in the automotive electronics and interior sector despite its superior growth dynamics. We continue to believe that the strong growth metrics of paragon relative to its peers warrant a premium in ratings, with the development of Voltabox and Mechanics more than compensating for the transition to a new generation of sensors in Electronics. paragon thus remains a high-growth technology-based company and the view is supported by its PEG (P/E and EPS growth) ratio of just 0.3x compared to its peers at 0.9x.

Exhibit 13: Peer group comparison

	Year end	FX	Price	Market cap	Sales CAGR	P/E (x)		EV/Sales (x)		EV/EBITDA (x)		EV/EBIT (x)		Dividend yield (%)	
			(local)	(local bn)	(2018-20e)	Year 1	Year 2	Year 1	Year 2	Year 1	Year 2	Year 1	Year 2	Year 1	Year 2
Electronics/Interiors/Cockpit peers															
Continental (GER)	Dec-17	EUR	198	39.6	1.8%	12.2	11.0	0.9	0.9	6.1	5.5	8.8	7.9	2.5	2.7
Denso (JP)	Mar-18	JPY	5669	4,501.6	1.7%	14.2	13.1	0.8	0.7	6.0	5.6	10.4	9.7	2.4	2.5
Delphi (US)	Dec-17	USD	45	4.0	1.4%	9.4	8.5	1.0	1.0	6.5	6.1	8.6	8.1	1.5	1.6
Magna (US)	Dec-17	USD	60	20.9	0.9%	8.5	7.8	0.6	0.6	5.4	5.2	7.6	7.3	2.1	2.3
Lear (US)	Dec-17	USD	179	11.8	1.5%	9.2	8.4	0.6	0.5	5.4	5.2	6.8	6.5	1.5	1.5
Hella (GER)	May-17	EUR	50	5.6	2.0%	14.0	12.7	0.8	0.8	5.9	5.4	10.2	9.6	2.1	2.3
Visteon (US)	Dec-17	USD	119	3.5	3.8%	17.1	15.2	1.1	1.0	9.1	8.4	12.2	10.9	0.0	0.0
Peers average					**1.9%**	**12.1**	**10.9**	**0.8**	**0.8**	**6.3**	**5.9**	**9.2**	**8.6**	**1.7**	**1.8**
paragon (Bloomberg)		EUR	46	0.2	7.8%	28.3	17.3	1.2	0.9	7.2	5.3	13.2	9.1	0.7	0.9

Source: Edison Investment Research, Bloomberg data. Note: Priced at 26 July 2018.

Capped DCF shows upside potential

We use a capped DCF methodology to value the cash flow of paragon. We use a six-year forecast period and cap growth in the terminal value at 0%. To reflect that terminal state, we set working capital to zero and normalise capex to depreciation. For a growth company such as paragon we feel is more conservative as it curtails longer term growth expectations in the tail cash flows. We use a calculated WACC of 8.2%. Currently, the capped DCF returns a value of €98 per share.

In terms of sensitivity to terminal growth rates and WACC, the following table displays a range of value outcomes compared to our assumed parameters. We have highlighted the closest assumptions to our own. Despite the WACC being higher than assumed last year in our Outlook's DCF valuation, the value returned has still increased as the sales expectations have accelerated by around 15–20% in the forecast period following FY17 results and management guidance and the longer-term EBIT contribution is thus much higher, with a terminal EBIT margin in 2023 now forecast at 12.5% and EBIT CAGR of 27% in 2018-23e (from €17m to €69m). The €101 value highlighted is the closest to our calculated WACC assumption.

Exhibit 14: Financial sensitivity of capped DCF to WACC and terminal growth rates (€)

WACC	6.0%	6.5%	7.0%	7.5%	8.0%	8.5%	9.0%	9.5%	10.0%
Terminal growth rate									
0%	151	136	123	111	**101**	93	85	78	72
1%	152	137	124	112	102	94	86	79	73
2%	154	138	125	113	103	95	87	80	74
3%	155	140	126	115	104	96	88	81	74

Source: Edison Investment Research

Financials

As the acquisition has yet to complete, we have not included Navitas in our modelling, although clearly the €43m acquisition price would leave paragon in a near-neutral net debt situation as Voltabox continues to invest its IPO cash proceeds. At the end of Q118 paragon had a net cash position of €63.3m, including Voltabox's net cash of €91.1m.

Guidance for strong growth in FY18 is driven primarily by Voltabox, although the Mechanics division is also growing rapidly from a smaller revenue base and is boosted by the acquisition of HS Genion late last year, creating paragon movasys. This should add significant revenues and profitability. Following Q118 results, management reaffirmed its guidance for FY18 revenues of between c €175m with an EBIT margin of c 9.0%. It will report half-year results on 21 August 2018.

We expect the rapid growth of revenues to continue in FY19 with continued strong growth at Electromobility and Mechanics and a resumption of growth at Electronics. We also expect overall EBIT margins to start rising towards our long-term expected range of 12–13%, largely thanks to volume effects.

Investing for growth and delivery

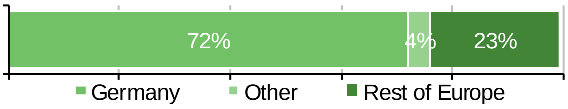
The high and growing level of organic investment by the group is also expected to be maintained with management indicating a volume of €35m for 2018 compared to €22m in FY17 before €15m spent on acquisitions. This is expected to be capex of €16.8m and capitalised intangible development of €18.2m. We would still expect this level to moderate in the medium term as required capabilities and capacities are attained, which should enhance free cash flow generation. However, we should expect paragon to continue to identify and use funds to drive further top-line growth as and when new opportunities present themselves.

The two tranches of the 2013 bond matured on 2 July 2018, with a combined value of €13m. Given the successful €50m bond issue in June 2017 carries a coupon of 4.5% compared to the 7.25% on the 2013 issue, we would expect to see net interest charges decline in both FY18 and FY19.

Exhibit 15: Financial summary

€m	2016	2017	2018e	2019e
Year-end December	IFRS	IFRS	IFRS	IFRS
PROFIT & LOSS				
Revenue	102.8	124.8	178.5	251.2
Cost of Sales	(57.7)	(71.2)	(98.2)	(130.6)
Gross Profit	45.0	53.6	80.3	120.6
EBITDA	16.1	20.6	27.7	40.4
Operating Profit (before amort. and except).	11.6	15.6	22.4	34.1
Intangible Amortisation	(1.5)	(3.0)	(4.2)	(5.4)
Exceptionals	(1.2)	(4.9)	(1.7)	(1.7)
Other	0.0	0.0	0.0	0.0
Operating Profit	8.9	7.6	16.6	27.0
Net Interest	(3.2)	(4.4)	(2.8)	(3.0)
Profit Before Tax (norm)	6.9	8.2	15.4	25.7
Profit Before Tax (FRS 3)	5.8	3.3	13.7	24.0
Tax	(2.2)	(3.9)	(3.7)	(6.5)
Profit After Tax (norm)	4.3	2.9	11.2	18.7
Profit After Tax (FRS 3)	3.6	(0.7)	10.0	17.5
Average Number of Shares Outstanding (m)	4.2	4.5	4.5	4.5
EPS - fully diluted (€)	1.02	0.67	2.08	3.24
EPS - normalised (€)	1.02	0.67	2.08	3.24
EPS - (IFRS) (€)	0.8	(1.0)	1.8	3.0
Dividend per share (€)	0.3	0.3	0.3	0.3
Gross Margin (%)	43.8	42.9	45.0	48.0
EBITDA Margin (%)	15.7	16.5	15.5	16.1
Operating Margin (before GW and except.) (%)	11.2	12.5	12.5	13.6
BALANCE SHEET				
Fixed Assets	75.7	104.1	134.6	156.4
Intangible Assets	38.0	67.4	84.4	97.5
Tangible Assets	37.4	36.4	49.8	58.6
Investments	0.3	0.3	0.3	0.3
Current Assets	39.8	207.7	187.6	197.5
Stocks	13.7	17.3	21.4	30.1
Debtors	8.4	32.7	60.7	80.4
Cash	14.3	145.8	91.8	70.8
Other	3.4	11.9	13.7	16.2
Current Liabilities	(36.0)	(46.4)	(38.2)	(52.5)
Creditors	(22.6)	(27.4)	(38.2)	(52.5)
Short term borrowings	(13.4)	(19.0)	0.0	0.0
Long Term Liabilities	(38.2)	(70.4)	(75.0)	(75.7)
Long term borrowings	(35.8)	(67.3)	(72.5)	(73.5)
Other long term liabilities	(2.5)	(3.1)	(2.6)	(2.2)
Net Assets	41.3	195.0	208.9	225.7
CASH FLOW				
Operating Cash Flow	22.6	1.3	5.1	24.2
Net Interest	(3.2)	(4.4)	(2.8)	(3.0)
Tax	(2.6)	(5.2)	(4.1)	(6.9)
Capex	(22.1)	(21.8)	(34.6)	(35.2)
Acquisitions/disposals	(2.4)	(17.2)	0.0	0.0
Financing	13.2	142.9	(2.5)	0.0
Dividends	(1.0)	(1.1)	(1.1)	(1.1)
Net Cash Flow	4.5	94.4	(40.1)	(22.0)
Opening net debt/(cash)	39.4	34.9	(59.5)	(19.3)
HP finance leases initiated	0.0	0.0	0.0	0.0
Other	(0.0)	0.0	0.0	0.0
Closing net debt/(cash)	34.9	(59.5)	(19.3)	2.7

Source: Company reports, Edison Investment Research

Contact details	Revenue by geography
paragon AG Schwalbenweg 29 33129 Delbrück Germany +49 (0) 52 50 - 97 62-0 www.paragon.ag	

Management team

CEO and founder: Klaus Dieter Frers

Klaus Dieter Frers has a degree in mechanical engineering from the University of Stuttgart, Germany. He started his career at AEG-Telefunken and joined Nixdorf Computer in Paderborn, Germany in 1983, where he led electronics production. Five years later he founded his own business, paragon, as a manufacturer of electronics. In the mid-1990s he managed paragon's access to the automotive market. Since November 2000, paragon has been a listed company on the Prime Standard of the German Stock Exchange in Frankfurt. Mr Frers also founded German sports car company Artega.

Chief technology officer: Dr Stefan Schwehr

Dr Schwehr joined paragon in April 2014 from Daimler, where he gained some 20 years of managerial experience while working on the development of electronic components. In his last role, he was responsible for the preliminary development of vehicle instrumentation and control systems. He had previously headed up various departments, including instrumentation and mechatronics.

Chairman of the supervisory board: Professor Lutz Eckstein

Following completion of his studies in mechanical engineering, including a doctoral degree from the University of Stuttgart, Professor Eckstein worked for 10 years in research and development at Daimler, followed by five years in a management position at BMW Group in the electrical/electronic area. Since 2010 he has headed the Institute of Automotive Engineering at RWTH Aachen University, the key current research areas of which include electromobility, lightweight design and networking of driver assistance systems with vehicle control systems. Among his professional activities, Professor Eckstein is a member of the National Platform for Electromobility, a German federal government advisory committee, and is the inventor of more than 80 German and international patents.

CEO of Voltabox: Jurgen Pampel

Mr Pampel held various positions at paragon since 2004 and was latterly the head of the Electromobility business unit from 2011 until his appointment as CEO of Voltabox in 2017. He is a mechanical engineer and an expert in process development and optimisation.

Principal shareholders	(%)
Klaus Dieter Frers	50
Otus Capital Mgmt	3
Hansainvest GmbH	3
Oddo	3
Taaleri Rahastoyhtio Oy	2

Companies named in this report

Continental (GER), Denso (JP), Delphi (US), Fresenius (GER), Hella (GER), Lear (US), Magna (US), Visteon (US)