

Naventus Equity Research

This report was completed and disseminated on November 18, 2021 at 09:30 CET

Insplorion AB (publ)

Positioned to optimize EV penetration and expedite breakthrough of hydrogen gas applications

Insplorion is positioned to expedite growth of the company's patented sensor technology within its battery and hydrogen operations. In September this year, following a period of leasing, a leading German vehicle manufacturer purchased the company's system, proving the strength of Insplorion's battery sensor technology and paving the way for licensing agreements in 2023. Within its hydrogen gas operations, Insplorion has had a promising collaboration with Powercell aimed at the creation of a prototype with a focus on fuel cells, which opens up opportunities for the commercialization of hydrogen-gas sensors. At the same time, the company's new major shareholder, the London-based hydrogen-focused fund, AP Ventures, has shown a sharpened interest in Insplorion's hydrogen business.

Platform for multiple fields of application

Insplorion has a differentiated product catalog, with exposure to fast-growing markets through its patented NanoPlasmonic Sensing (referred to below as "NPS") technology used in battery sensors, hydrogen sensors, air-quality sensors and research instruments.

Initiating coverage with a Base scenario of SEK 25 (SEK 18–34)

We believe that Insplorion is well positioned in the field of battery sensors due to (i) the business relationship with the German car manufacturer and (ii) exposure to new potential customers through the 3beLiEve project. We expect the EV market, which is the driver of growth for battery sensors, to accelerate from 2023 onward, while the shift towards hydrogen applications and hydrogen sensors will accelerate around 2025.

We expect Insplorion to show a sales growth, from MSEK 2.9¹ in 2020 to MSEK 150 in 2026E, and protracted wide gross profit margins (>90%) as the company secures license agreements for its sensors. The motivated value in our Base scenario amounts to SEK 25 (within the range of SEK 18–34). In our estimates for 2025E, the company is traded at 3.2x (EV/Sales) and 14.4x (EV/EBITDA).

¹1,2 MSEK excluding grants/ appropriations for the financial year 2020.

Initial Coverage ☒

Update Report ☐

Significant Event ☐

Rating

Base scenario	SEK 25
Conservative scenario	SEK 18
Confident scenario	SEK 34

Data

Ticker	INSP
ISIN	SE0006994943
Next event:	Naventus Technology Summit, November 18
Share price (SEK)	14.98
Market cap (MSEK)	194.6 M
Market cap (MSEK)	(48.4 M)
EV (SEK M)	146.2 M
No. of shares	12.99 M
Free float (%)	96.70

Ownership structure

Shareholders	Share, %
Avanza Pension	8.46
Formue Nord A/S	4.04
Mikael Hägg	3.82
AP Ventures	3.44
Other	80.24
Total	100.00

Share price trend, 2021



Financials (SEKm)	2020A	2021E	2022E	2023E	2024E	2025E
Operating revenue	2,9	5,6	7,1	9,0	19,8	46,2
EBITDA	-12,2	-11,9	-17,8	-18,9	-10,3	10,1
EBITDA margin	neg.	neg.	neg.	neg.	neg.	22%
EBIT	-12,6	-12,5	-17,8	-18,9	-16,2	4,1
EBIT margin	neg.	neg.	neg.	neg.	neg.	9%
Sales Growth	nm	93%	26%	27%	119%	134%
Metrics	2020A	2021E	2022E	2023E	2024E	2025E
EV/Sales	49,9x	25,9x	20,6x	16,2x	7,4x	3,2x
EV/EBITDA	neg.	neg.	neg.	neg.	neg.	14,4x
EV/EBIT	neg.	neg.	neg.	neg.	neg.	36,0x

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Investment case

EV (Electric Vehicle) – extensive market progress

The EV market is expected to grow by 22.6 percent annually, driven by political factors, the aggressive targets of vehicle manufacturers and changes in consumer behavior. In order to guarantee safety, optimize range and acceleration, our view is that the future standard in the production of EVs and plug-in hybrids will be “smart cell batteries.” This entails the autonomous control of each cell, with sensors playing a crucial role. The sensors must be small, so as not to take up too much space and to provide an efficient cost profile. Insplorion's battery sensor meets these requirements, and we expect Insplorion to achieve a significant position in this field. Several of the major vehicle manufacturers have aggressive EV targets. Among others, Volvo Cars has expressed that they will have a fully electric vehicle fleet by 2030. Volvo Cars aims to sell 1.2 million cars within four years (by 2025), of which 50 percent will consist of EVs and plug-in hybrids.

Hydrogen sensor – potential component in aviation fuels of the future

We estimate that in the short term, our hydrogen operations will grow as the project with Powercell is assessed. The use of hydrogen requires a high level of safety, as well as rapid and reliable response. In the longer term, the aviation industry's conversion from fossil fuels to, for example, hydrogen gas, will be of interest. It will impose stringent demands for sensors to have characteristics such as rapid response and high reliability – Insplorion's hydrogen sensor, which is also the world's fastest, may have a crucial role to play.

NPS – scalable platform with multiple fields of application

Insplorion's platform, NanoPlasmonic Sensing (NPS) is a patented technology. Insplorion has identified four different business areas: battery sensors, hydrogen sensors, air-quality sensors and research instruments. The technology's features enable its usage across several different industries, such as life sciences, where research instruments are in use today. The company thus has great opportunities to scale up its operations within several fields of application.

Credibility from academia

We consider the collaboration with the Chalmers University of Technology and research instruments as two important factors on the road to commercialization – it strengthens Insplorion’s credibility and confirms the technology. Tesla applies a similar model, through which they develop new technologies in collaboration with Dalhousie University.

Short-term drivers for the share

Insplorion is conducting work on several projects (3BeLiEVe, AMTE, and Powercell). We are optimistic about the company’s project model and that it contributes to the development and adaptation of the technology for large-scale volumes. In the short term, we expect the driving forces for the share to comprise (i) new joint ventures with partners (ii) new customers who order test instruments and (iii) additional orders from the German vehicle supplier.

Valuation estimate

We expect Insplorion to be on the verge of a significant breakthrough in their battery sensors due to its collaboration with the German vehicle manufacturer, and the sharp shift from internal combustion engines to EVs and plug-in hybrids among all vehicle manufacturers.

Insplorion has an efficient organization, and we expect Insplorion to continue to be a company with an R&D focus, and that the company will secure license agreements for the commercialization of its battery and hydrogen sensors in the future.

Based on our estimates of three different scenarios, we set a range of SEK 18–34 per share with a Base scenario of SEK 25 per share.

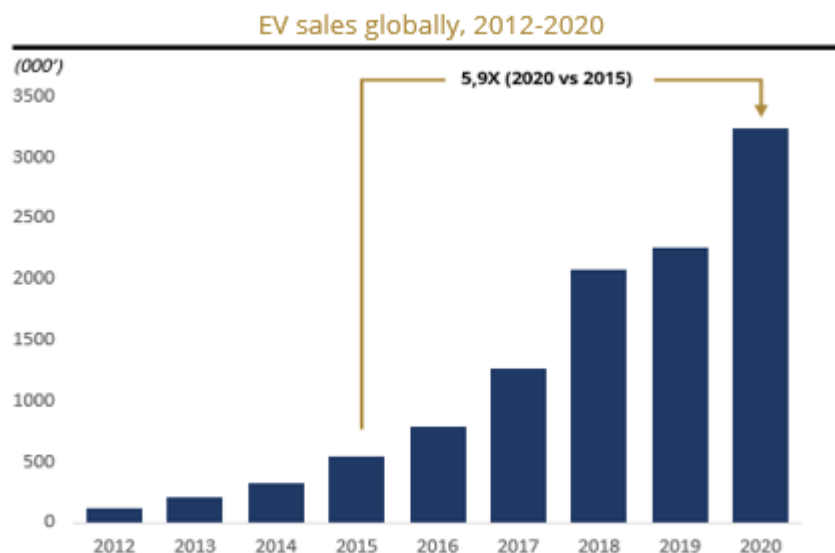
Income Statement	Hist. 2020	Proj. 2021	Proj. 2022	Proj. 2023	Proj. 2024	Proj. 2025	Proj. 2026	Proj. 2027	Proj. 2028	Proj. 2029	Proj. 2030	Proj. 2031	Proj. 2032	Proj. 2033	Proj. 2034	Proj. 2035
Operating revenue	2,9	5,6	7,1	9,0	19,8	46,2	147,2	203,6	260,1	316,7	401,1	499,6	612,1	673,5	778,4	883,7
Capitalized expenses	4,6	3,2	4,5	5,0	7,0	8,1	24,4	29,7	36,4	40,5	46,5	54,0	61,2	63,3	70,1	76,0
Total Revenue	7,5	8,9	11,6	14,0	26,8	54,4	171,7	233,3	296,5	357,2	447,7	553,5	673,3	736,8	848,5	959,7
COGS	-0,5	-0,6	-1,4	-1,9	-1,9	-3,5	-9,2	-12,3	-15,5	-18,8	-23,6	-29,1	-35,4	-39,1	-45,1	-51,3
Gross profit	7,0	8,3	10,1	12,1	24,9	50,8	162,5	221,0	280,9	338,4	424,1	524,4	637,9	697,7	803,4	908,4
Sales and marketing	-8,9	-10,7	-13,5	-14,5	-15,8	-18,5	-58,9	-81,4	-104,0	-110,8	-120,3	-134,9	-146,9	-148,2	-155,7	-159,1
Logistics	0,0	0,0	-0,2	-0,3	-0,6	-1,4	-4,4	-6,1	-7,8	-9,5	-12,0	-15,0	-18,4	-20,2	-23,4	-26,5
Technology costs	0,0	0,0	0,0	-0,9	-3,0	-6,9	-22,1	-30,5	-39,0	-47,5	-60,2	-74,9	-91,8	-101,0	-116,8	-132,5
General and Admin	-10,3	-9,5	-14,2	-15,4	-15,8	-13,9	-36,8	-30,5	-31,2	-34,8	-40,1	-45,0	-49,0	-47,1	-54,5	-61,9
EBITDA	-12,2	-11,9	-17,8	-18,9	-10,3	10,1	40,3	72,4	98,9	135,7	191,5	254,7	331,8	381,2	453,1	528,4
Depreciation	-0,4	-0,6	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Amortization	0,0	0,0	0,0	0,0	-5,8	-6,1	-6,5	-10,1	-14,0	-18,5	-22,9	-27,6	-32,9	-38,6	-43,5	-48,8
EBIT	-12,6	-12,5	-17,8	-18,9	-16,2	4,1	33,8	62,3	84,9	117,3	168,6	227,0	298,9	342,6	409,6	479,6
Minority interest		0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Net interest income / expense	-0,2	-0,2	-0,2	-0,2	-0,6	-1,0	-1,0	-1,0	-1,0	-1,0	-1,0	-1,0	-1,0	-1,0	-1,0	-1,0
PBT	-12,8	-12,7	-18,0	-19,1	-16,8	3,0	32,8	61,3	83,9	116,2	167,5	226,0	297,9	341,6	408,5	478,6
Tax expense	0,0	0,0	0,0	0,0	0,0	-0,7	-7,2	-13,5	-18,4	-25,6	-36,9	-49,7	-65,5	-75,2	-89,9	-105,3
Net income	-12,8	-12,7	-18,0	-19,1	-16,8	2,4	25,6	47,8	65,4	90,7	130,7	176,3	232,4	266,4	318,7	373,3

Image: Overview of the forecast period: Income statements 2020–2035E

Acceleration of battery and hydrogen applications driving demand for advanced sensors

Historical performance of the EV market

In 2020, a historic milestone was achieved when the number of registered EVs worldwide totaled 10 million, and the number of newly registered EVs rose by 43 percent.¹ For the first time, Europe had more newly registered EVs (1.4 million) than China (1.2 million), followed by the US (295,000). Cumulatively, consumers spent USD 120 billion on electric cars and hybrids in 2020 – a 50 percent increase from 2019, of which 41 percent was attributable to sales and 6 percent to price increases. These figures indicated a robust purchase sentiment²



Source: Frost & Sullivan, Prospekt Volvo Cars AB (publ) 2021

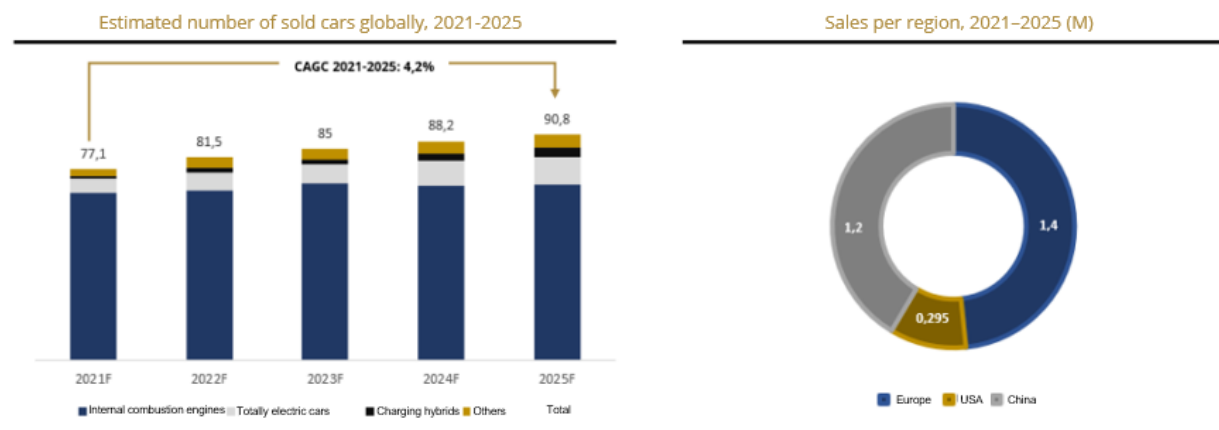
Future prospects for the EV market

¹ International Energy Agency (IEA)

² VirtaGlobal, "The Global Electric Vehicle Market Overview in 2021: Statistics & Forecasts"

The market is expected to achieve a value of USD 802 billion in 2027 and an annual growth rate of 22.6 percent (2020–2027).³

For the past three years, the number of units of plug-in hybrids and full-electric cars sold have nearly tripled, from 1.2 million in 2017 to 3.2 million in 2020. The market is expected to reach 13.7 million in units sold by 2025 – with the highest degree of electrification taking place in China and Europe.⁴ According to *New Energy Vehicles Technical Roadmap 2.0*, due to its government guidelines, China is expected to maintain its market-leading position in full-electric cars and produce 5.2 million vehicles in 2025. Europe is expected to dominate in plug-in hybrids and account for approximately 53 percent of the global market, corresponding to 1.4 million vehicles in 2025.⁵ Overall, the full-electric car segment is expected to accelerate growth and to spearhead the general EV market with a global penetration of 12.3 percent, corresponding to 11.2 million vehicles. Together with plug-in hybrids, global penetration is expected to reach 15.1 percent in 2025, corresponding to 13.7 million vehicles.⁶



Several major vehicle manufacturers are undergoing a shift toward exclusively manufacturing electric vehicles. For example, Volvo Cars has a target of becoming fully EV manufacturer by 2030. Frost & Sullivan estimates that global sales of hybrids, plug-in hybrids, full electrics and combustion-engine cars will total 90.8 million units by 2025. Of these global car sales, sales of electric cars by leading vehicle manufacturers are expected to reach 14 million units by 2025.⁷ Relative to the annual sales of each vehicle manufacturer, electric cars are expected to account for between 13 to 20 percent of sales in 2025, with Volvo Cars standing out, at 50 percent.⁸

³ AlliedMarketResearch, "Electric Vehicle Market by Type: Global Opportunity Analysis and Industry Forecast, 2020-2027"

⁴ Frost & Sullivan, Prospekt Volvo Cars AB (publ), 2021

⁵ New Energy Vehicles Technical Roadmap 2.0

⁶ Frost & Sullivan, Prospekt Volvo Cars AB (publ), 2020

⁷ Frost & Sullivan, Prospekt Volvo Cars AB (publ), October 18, 2021

⁸ Frost & Sullivan, Prospekt Volvo Cars AB (publ), 2020

In 2020, Germany accounted for the largest share of EV sales in Europe, followed by the United Kingdom, with 295,000 new registrations and 176,000 respectively. In terms of sales as a percentage, the leading countries were Norway (75 percent), followed by Iceland (50 percent) and Sweden (30 percent).

Several major truck manufacturers whose sales of electric trucks increased by 10 percent in 2020 are also striving to have fully electric fleets in the immediate future. Furthermore, global sales of electric buses totaled 600,000 (2020) units, of which China accounted for 78,000 new registrations. Another global leader in electric buses is Chile, which aims to have all public transportation electrified by 2040.

Battery architecture in EVs

In electric vehicles, the battery pack consists of several battery modules, with each module comprising several battery cells. The battery pack accounts for about 40–50 percent of the vehicle's cost. For example, a BMW i3 comprises 96 cells, 8 modules and 1 battery pack⁹, compared with the Tesla Model 3 Long Range, which comprises 4,416 battery cells divided by 96 groups and one battery pack. In simplified terms, the more battery cells, the more powerful the battery pack.



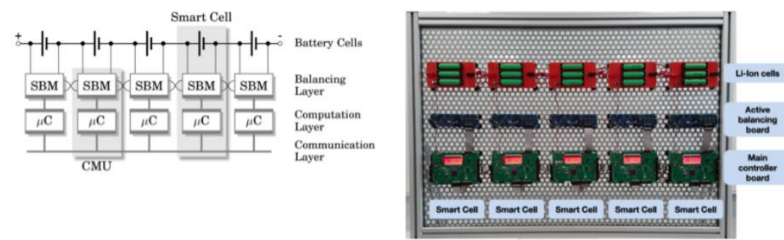
Image: Illustration of battery pack

Smart battery cells

In comparison with alkaline batteries, lithium-ion batteries may generally have higher capacities, cope better with high pulse currents, have a longer service life and longer storage times. In addition, the cell voltage is significantly higher, which contributes to higher energy content. However, Lithium-ion batteries also come with advantages and drawbacks. Usage of lithium-ion batteries requires higher levels of safety. Smart batteries are being developed to ensure that these safety requirements are met. Smart batteries enable greater accuracy in measurements and impose less demands on the scope of safety margins, thanks to the enhanced maximization of the battery's capacity. Smart batteries also contribute to power optimization, which improves acceleration and speeds up charging processes. The technology equips each cell with a system that monitors

⁹ Samsung SDI, "The Composition of EV Batteries: Cells? Modules? Packs? Let's Understand Properly!"

and controls the cell's parameters, making it a "smart cell." This translates concepts from the IoT domain into energy storage.¹⁰ The image below illustrates the workings of a smart battery.



Source: Technische Universität München "Decentralized Smart Energy Systems: Smart Battery Cells"

The advantage of the system is that it provides detailed information about the battery by reporting its charge status, health status and the remaining driving time. This is already important today, but will come into greater focus in the future, when the present 12V and 24V standard is replaced by a 48V system. It will be important for ensuring the safety that is required for higher voltages and for enabling more complex feedback.

Without sensors, smart cells can measure the current and voltage on the outside of the cell, but sensors are required for measuring the internal conditions of the battery. To power a car, very powerful batteries are required, but their performance deteriorates after a couple of years of use, which results in shorter ranges and longer charging times, etc. Optimizing the battery's service life and performance improves the investment appraisal of the value of the battery/car, while making EVs more competitive against fossil-fuel vehicles and consequently, accelerating the penetration of EVs.¹¹

Battery sensor market

To obtain in-depth information about the battery's health condition, sensors are required. To gain optimum knowledge about the health of the cells, each cell should be equipped with a battery sensor. The number of cells per vehicle varies depending on the manufacturer and segment. In our opinion, the average car should have at least 150 sensors to achieve the desired effect, provided that the sensors are cost-efficient. Frost & Sullivan estimates that 14 million EVs and plug-in hybrids will be sold in 2025¹². At 150 sensors per vehicle the number of battery sensors sold will total 2.1 billion in 2025.

Hydrogen usage

Hydrogen and energy have an extensive and shared history. Among other things, hydrogen was used to power the first internal combustion engine some 200 years ago. Since then, hydrogen has been strongly linked to the

¹⁰ Catherino, H & Batson, D "Smart batteries for automotive applications"

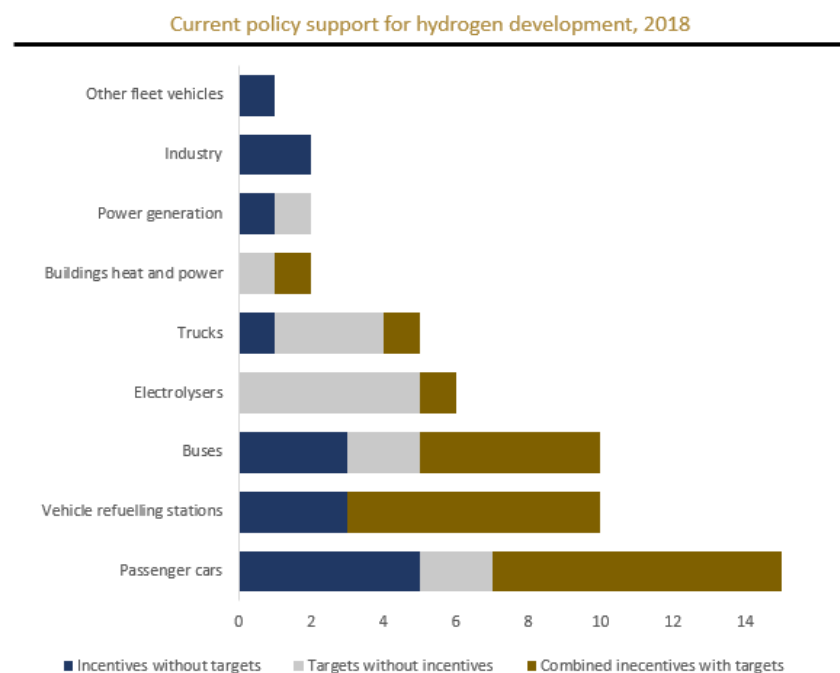
¹¹ Greenpeace East Asia "Greenpeace report troubleshoots China's electric vehicles boom, highlights critical supply risks for lithium-ion batteries"

¹² Frost & Sullivan, Prospekt Volvo Cars AB (publ) 2021

modern processing industry, because it is light, storable, energy-dense and produces no direct emissions of pollutants or greenhouse gases.

Hydrogen gas is in considerable demand within manufacturing industries. Although the use of hydrogen has historically been risky and it was used only by industry, today, hydrogen can be used in most fields of application.

The figure below shows the number of countries that have non-target specific incentives, countries that have non-incentive specific targets, and the two alternatives combined. Judging from the figure, most countries are interested in the development of hydrogen-powered cars.



Source: IEA, "The Future of Hydrogen"

Hydrogen sensors

As mentioned above, hydrogen can be utilized in numerous fields, but its use is associated with some safety risks. Consequently, it is important for the technology that is used to be fast and reliable, which brings Insplorion's hydrogen sensors into the picture. The market for hydrogen fuel cells is expected to grow in the coming years and achieve a market value of USD 42 billion in 2026.¹³

Hydrogen-powered buses

Hydrogen-powered buses are becoming more commonplace, particularly in England. London already has more than 500 electric buses and intends to achieve zero emissions by 2030. On June 24, 2021, the Mayor of London announced that 20 new hydrogen-powered double-deckers would be put into service in England. The bus manufacturer is Wrightbus

¹³ Insplorion, "Annual report 2020"

and the manufacturer of the gas cylinders is Luxfer, which is based in Nottingham.¹⁴

Sensors will be necessary for ensuring the safety levels required for hydrogen use.

Hydrogen-powered airplanes

Intensive research is underway to create alternative fuels for the aviation industry. An alternative that could come to be relevant is hydrogen-powered hybrid aircraft. The aim is for the aircraft to be powered by a gas turbine engine that burns liquid-hydrogen fuel and which also generates electricity through hydrogen fuel cells.

The California-based company ZeroAvia made some progress earlier this year within this field when they, jointly with partners from the UK and other countries, developed a hydrogen-powered commercial aircraft with a capacity for only six passengers.

Airbus has launched project ZeroE, through which they are working toward green transportation for the aviation industry. The project is backed by the EU, among other players.

Airbus has presented three different types of aircraft that could be ready by 2035. The first is a propeller-driven aircraft with a capacity of 100 passengers and range of 1,850 km. The second is a jet plane with a capacity of 200 passengers, which can fly twice as far. Both planes resemble present-day aircraft in terms of appearances. However, the third alternative will have a different design. Airbus describes it as a futuristic plane with a “blended-wing design” (see image below). The third plane will be capable of transporting more passengers than the other two models, and will have a longer flight range.¹⁵

¹⁴ Electrive, “London Launches England’s first hydrogen bus fleet”

¹⁵ BBC, “The Hydrogen Revolution in the skies”



Source: BBC, "The Hydrogen Revolution in the skies"

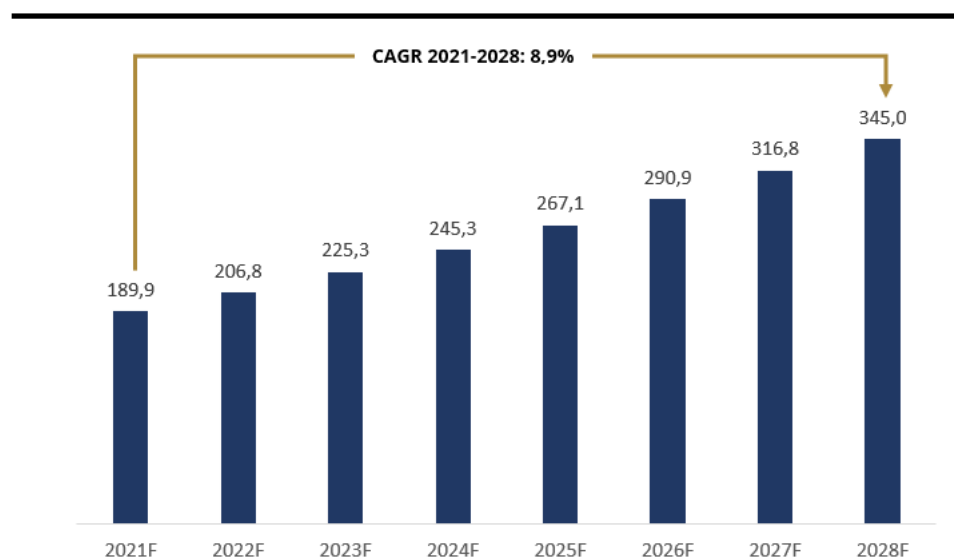
Battery sensor market

Insplorion penetrates several different markets through its patented technology: the battery market through its battery sensors, the hydrogen market through its hydrogen sensors and the air-quality market through its air-quality sensors. The same NPS platform is used within all its business areas. The platform provides Insplorion with exposure to several different underlying sectors that are experiencing strong growth.

The underlying market, which encompasses all of their business areas, is expected to grow in the next few years and attain a value of USD 345 billion in 2028, and an annual growth rate of approximately 8.9 percent.¹⁶

¹⁶ Alliedmarket "Sensor Market By Type: Global Opportunity Analysis and Industry Forecast, 2021-2028"

Estimated performance of the sensor market, 2021–2028 (USD million)



Source: Alliedmarket "Sensor Market By Type: Global Opportunity Analysis and Industry Forecast, 2021–2028"

Competition

Battery sensors

Insplorion has no direct competitors within battery sensors, but there are a dozen research projects pursuing non-voltammetric measurements. However, these are primarily aimed at detecting temperature rises at an early phase. Insplorion's competitors include Gaye Technologies, GE and PARC – the latter being the closest competitor. PARC, a division of Xerox, is developing a FBG sensor, which is capable of non-voltammetric measurements of charging and health status. The greatest difference between Insplorion's sensor and PARC's sensor is that PARC draws its conclusions based on the battery's expansions and contractions, while Insplorion proceeds from the chemistry of the battery.

Hydrogen sensors

The competitors within hydrogen sensors consist of Figaro Engineering Inc and SGX Sensortech. Both companies have a broad product range and catalogs that include hydrogen sensors and air-quality sensors. Figaro Engineering also has the world's smallest gas sensors. Nevertheless, Insplorion has a clear competitive advantage over both companies, as it has the world's fastest hydrogen sensor.

Air-quality sensors

Air-quality measurements are not a new phenomenon. Consequently, there are competitors within this segment, such as the niche companies Birdi, CubeSensors and SGX Sensortech, as well as the major industrial companies Honeywell and Siemens. The major companies are regarded as either competitors or customers.

Present-day sensors are large, cumbersome and expensive. However, Insplorion's product is smaller and costs less, which allows for several sensors to be on placed the same surface, enabling a more detailed measurement of air quality.



Driving forces

Long-term driving forces

The sensor market is ultimately driven by climate goals set by the EU. On July 14, 2021, the Commission adopted a package of proposals to harmonize the EU's climate, energy, transport and tax policies, with the target of reducing greenhouse gas emissions by at least 55 percent by 2030, in comparison with 1990 levels. These are in line with the EU's goal of becoming the first climate-neutral region by 2050.¹⁷

These targets will create opportunities for further innovation, investments and jobs. One of the interim targets to becoming climate-neutral, is to make sustainable transports available to everyone. To succeed in this regard, various EU member states are encouraging EV ownership by providing subsidies and tax relief for EV purchases.

As the number of EVs and plug-in hybrids increases, charging infrastructure will be faced with increased pressure. Consequently, heavy capital investments are being made in infrastructure, to enable people to travel near and far, regardless of where they live.

To improve the building of charging infrastructure, charging stations must be optimized, i.e. so that they can safely charge batteries to their maximum capacities. This, in turn, requires that the installation of sensors in charging stations.

It was not long ago that the supply of EV alternatives was relatively limited and aimed primarily at luxury consumption. Those who purchased a Tesla did so due to its stomach-tickling acceleration and because it was something new. Today however, ever-more companies have begun to position themselves in the EV market, within all categories, from budget to luxury.

A natural sales pitch would be the vehicle's range. Although having several battery cells in each module and pack can provide a longer range, the caveat is the increase in cost. Even in budget models, more energy can be

¹⁷ European Commission, "Delivering the European Green Deal"

extracted from the available cells by optimizing them through battery sensors. However, having more battery cells may not necessarily improve the range, as cells have different capacities i.e. how much energy they contain. For example, Tesla has more cells than the EVs of many other vehicle manufacturers, but it does not automatically entail more energy/capacity.

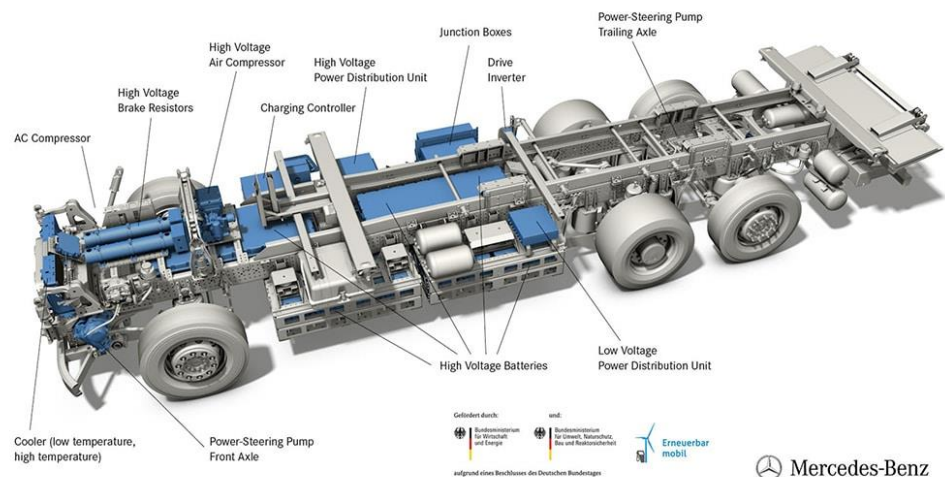
With respect to the hydrogen sector, the Commission wants to implement carbon pricing for aviation and see new alternatives to aviation fuels. One alternative that has been tested is hydrogen-powered aircraft, which are powered by a gas turbine engine and hydrogen fuel cells. To be able to use hydrogen, stringent safety requirements must be in place, which is achieved through fast sensors that can provide precision measurements. The aviation industry is a major industry that, in conjunction with its conversion to greener alternatives, could account for a large share of future sensor-market revenues.

Short-term driving forces

For new technology to be implemented in a new vehicle model and included in serial production, a design win is required. A design win is a term used within the semiconductor and sensor industries, and in the event of such a win, the company's technology will be utilized at a large scale. In other words, when a company communicates a design win, it indicates that its technology will definitely be included in volume sales. This presupposes a successful implementation of the technology concerned.

With respect to passenger vehicles, the types of components that are to be used in their manufacture are decided far ahead of their launch. This is due to major corporations having several different decision-makers in each department, the stringent requirements on design and safety, and large-scale production. Strategic choices on components must thus be made far in advance of manufacturing and sales. Nevertheless, the production cycles can be long – which could result in new technology failing to be used, even if there are new technologies available, which could improve the finished product.

However, this works differently with heavy vehicles (buses and trucks) which involve lower volumes. In simplified terms, trucks are also more modular in comparison with passenger cars – this allows for manufactures to replace various components if they so wish, in a different manner. In essence, the cycles are shorter. This is also true for buses, which are very similar to trucks. With shorter cycles, it can be faster for subcontractors to achieve commercialization and volume production compared with subcontractors whose focus is strictly on the passenger car industry.



Source: Malewar, A. "Mercedes-Benz prepares all-electric eEconic waste-collection truck"

Operations

Insplorion is a Swedish cleantech company based in Gothenburg and listed on Nasdaq First North Growth Market. Its underlying technology was developed at the Chalmers University of Technology's Division of Chemical Physics, which was privatized in 2010.

Insplorion has identified four business areas where its NanoPlasmonic Sensing ("NPS") technology can be used: battery sensors, hydrogen sensors, air-quality sensors and research instruments. The company has distribution partners in Germany, Austria, the UK, Ireland, China, Japan and other countries.

Progress within battery operations

On September 14, 2021 a German vehicle manufacturer purchased a system for SEK 500,000 through the technology company, Kistler Group. The purchase follows a six-month rental period, during which the manufacturing company assessed opportunities to optimize its batteries using Insplorion's technology.¹⁸

Insplorion penetrates the battery market primarily through major EU projects aimed at designing the next generation's vehicle batteries. Together with 21 other companies including the Volvo Group, an exclusive group of companies is working to strengthen the European battery market and automotive industry. The project is called 3beLiEVe and is backed by the EU's H2020 research and innovation program. The project aims to create 250 third-generation lithium-ion batteries cells, in order to demonstrate 3beLiEVe's progress within passenger vehicles, freight vehicles, and commercial vehicles (buses and trucks).

¹⁸ Information from the company

One of the project's goals is to integrate sensors into each cell to enable the measurement of the battery's health status, which extends the service life of each battery. Using this information, battery cells can be replaced if their state of health is not within the desired level. The replaced cells can then be used for other applications that do not require the same type of performance.¹⁹

Insplorion contributes to the project through its battery sensors. The project has received very positive attention and provides Insplorion with direct exposure to potential customers who are also participants of the project, such as the Volvo Group.

The company is also contributing to a project called Inbat/Eurostars jointly with the UK company, AMTE (formerly AGM Batteries), through which Insplorion's battery sensor will be integrated with AMTE's batteries.

Progress within hydrogen operations

Although no commercial prototypes have been completed to date, the objective is to have a viable prototype ready by the end of 2021. The company is currently collaborating on product development with Chalmers University of Technology and Powercell.²⁰ Powercell manufactures fuel cells primarily for the boat industry but is faced with increased demands from the automotive industry (Powercell sales in 2020: MSEK 103, Market Cap SEK 9.52 billion).

Progress within air-quality sensors and research instruments

First and foremost, we are expecting a commercial breakthrough within battery sensors, followed by hydrogen sensors.

Current revenues are attributable to the rental/sales of research instruments. The industry vertical within research instruments is interesting and contributes to credibility, as they are sold to universities and potential customers within other industry verticals. We believe that credibility and support from academia is a key factor to achieving commercialization, as it strengthens the acceptance of the technology and provides scientific support for it.

Market strategy

Insplorion is part of several different collaborations, such as with Powercell, AMTE, and 3beLiEve, aimed at the commercialization of the company's battery and hydrogen sensors. Insplorion's project with Powercell is financed by the Swedish Energy Agency (MSEK 3.8). The goal of the project is to create a hydrogen sensor that will enable faster conversion to hydrogen, increase safety and optimize the operation of fuel cells. The project was published in the prestigious journal, *Nature Materials*, by co-applicant Prof. Christoph Langhammer's research group at Chalmers University of Technology. The project was launched in January 2020 and runs for 24 months, which means that its assessment is

¹⁹ 3beLiEve project "Delivering the 3b generation of LNMO cells for the xEV market of 2025 and beyond"

²⁰ Information from the company

thus imminent. If Insplorion's technology were to be successfully implemented, hydrogen operations could gain momentum as early as Q3/Q4 in 2022.

The link to academia for the commercialization of new technology has undeniably proven to be a successful model. Tesla has been collaborating on R&D with Dalhousie University in Canada since 2015, and with researcher Jeff Dahl, with a focus on the development of the next generation battery.²¹ We are of the opinion that Insplorion's origins and collaboration with the Chalmers University of Technology and the sale of instruments to universities is positive, and entails opportunities to accelerate the path to commercialization.

In customer projects for assessing Insplorion's technology and instruments, Insplorion works together with the customer's engineers and strategists (Business Development), who are usually part of the group that makes decisions on design wins and whether the technology should be included in production. Consequently, we regard the projects as an interesting model for gaining access and exposure to decision-makers.

License sales

Smart Eye is a company within "Human Insight AI." The company develops and sells sensors and software to the automotive industry that, with the help of AI, can:

- analyze and understand human behavior
- increase safety in self-driving cars

Smart Eye's sensor penetrates the vehicle market, similarly to Insplorion's battery sensor. Smart Eye sells its product to, among others, Bosch and Honeywell, through license sales.²²

We regard Smart Eye to be a comparable company to Insplorion and draw parallels to Smart Eye's history from an R&D perspective, and its aim to achieve commercialization through strategic projects. We expect Insplorion, like Smart Eye, to secure licensing agreements in order to maintain a flexible R&D-focused organization with the potential for wide gross profit margins.

Potential licensing partners

Insplorion's potential licensing partners include Bosch, Honeywell and AMTE. A potential collaboration with AMTE is closest at hand, as the companies are already working together.

Another potential licensing partner is Littelfuse, with whom Insplorion has a partnership agreement. Littelfuse is a world-leading company in circuit-board protection, with advanced platforms in current control and sensor

²¹ <https://www.dal.ca/dept/research-services/OCIE/about/SuccessStories/Tesla.html>

²² Smart Eye's website

technology. The company is exposed to the electronics, manufacturing and automotive industries.²³

Technology platform

Insplorion's NPS technology is based on an optical phenomenon known as Localized Surface Plasmon Resonance (LSPR). The phenomenon entails that small metal particles naturally capture a certain wavelength when illuminated by light. The specific wavelength depends on the size of the particle and what is in its immediate vicinity. Insplorion's measuring instruments are metal discs and nanostructures of gold attached to a glass plate that is illuminated by light from an optical fiber. The difference in intensity at different wavelengths is captured by an analysis instrument, known as a spectrometer. The wavelengths change as different materials come close to the gold particles. By studying how the wavelength changes, the company can make measurements on various materials.

There are also other LSPR-based measurement techniques. Insplorion differs from other players through a patented technology, where the metal particles receive a coating that is adapted to the material that is to be measured.

Insplorion's sensor technology is known as a platform technology, which means that it can be used in several different fields of application.

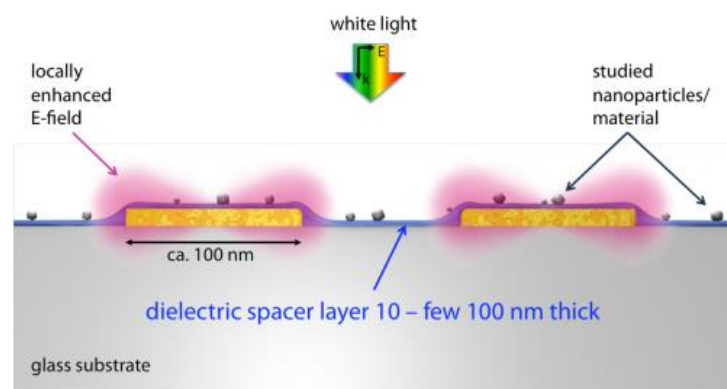


Image: Localized Surface Plasmon Resonance (LSPR), Insplorion

The technology's features

Fast

One advantage of Insplorion's sensors is that they can be made extremely fast. The company's hydrogen sensor is the world's fastest.²⁴

Robust

²³ Insplorion press release, July 16, 2018

²⁴ Syrenova et al (2015). Hydride formation thermodynamics and hysteresis in individual Pd nanocrystals with different size and shape. Published: *Nature Materials*

The nanoparticles are made of precious metals on optical materials such as polymers, glass or quartz, and can be coated with a protective layer. This enables their use under harsh chemical conditions, such as in the aggressive environment of a battery.

Temperature resistant

The sensors are temperature resistant, which allows for their use in studying processes at high temperatures and that processes that are impacted by temperatures.

Cost efficient

The sensors are manufactured cost-efficiently and are well suited for mass production.

Suitable for miniaturization

The sensors are well suited for miniaturization. A nanodisc is about 150 nanometers in diameter and only a small number is required, which allows for the creation of very small sensor units with sensor surfaces of only a fraction of a square millimeter.

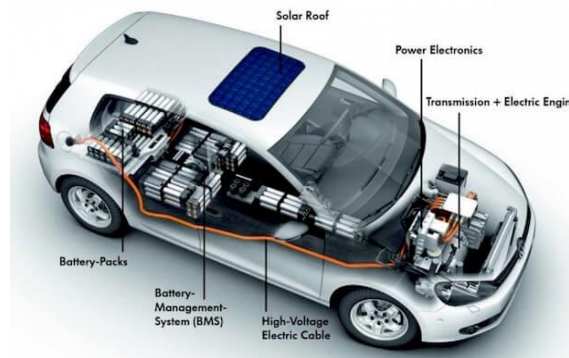
Discussion about valuation assumptions and estimates

Pricing factors

We estimate that the battery business will account for approximately 90 percent of sales in 2025. Therefore, we deem it to be of great importance to examine the segment's willingness to pay.

Willingness to pay can be deduced by comparing what vehicle manufacturers pay for their Battery Management Systems (BMS). The primary task of the BMS is to ensure that the battery pack is operating safely and reliably. The system receives the battery pack's voltage, temperature, and information about whether the battery is being charged or discharged. The system then runs several different algorithms to generate reliable data about: the charge status, health status and whether there are any error messages.²⁵

²⁵ Staffl systems "What is a Battery Management System?"



Source: EV DUNIYA "Function & Importance of BMS in Electric Vehicles"

Battery Management Systems are available in different designs and sizes, which makes their price vary greatly. A system with three cells in series (3s Battery Management System) is available for about USD 20. However, more cells are required for a system made for a car, thereby rendering the price from USD 1,000 to 5,000.

We used a Volkswagen ID.3 to calculate the average price of a BMS. The price of the model starts from SEK 444,900, which entails that a battery pack costs approximately SEK 177,960 (40 percent of the total sales price).²⁶

Jeff Nielsen explains the nature of the cost distribution in a lithium-ion battery pack in his report, *High-Grade Manganese Project Moving to Production*. Here, Nielsen concludes that a BMS accounts for about 16 percent of the battery pack's total cost.²⁷ This corresponds to approximately SEK 28,500 or USD 3,200 at today's exchange rate.

The BMS tends to be more expensive in the premium segment, because greater demands are placed on reliability in the premium segment. We estimate the number of sensors per vehicle to be 150 for a vehicle in the standard class – it is also possible to argue for more sensors per car depending on the category.

Pricing factors at Fingerprint

Although Fingerprint does not operate within the same market, it shares several common denominators with Insplorion, including large-volume sales of sensors to price-sensitive customers. According to Statista, Fingerprint's sales price per sensor varied between USD 5.5 and USD 2.0 during the period of 2014 to 2020.²⁸

Pricing factors at Littelfuse

Insplorion's partner, Littelfuse, is well familiar with the market and its willingness to pay for sensors. They estimate that sensors connected with the EV market can be sold for USD 1–5, depending on whether they are earmarked for use within the premium or basic segment.

²⁶ Volkswagen product portfolio

²⁷ Nielson, J. "High-Grade Manganese Project Moving to Production"

²⁸ Statista, "Average selling price of fingerprint sensors worldwide from 2014 to 2020"

Our price assumptions

Insplorion is a technology company with a strong R&D division, which, by teaming up with academia and participating in EU-funded projects, has achieved an interesting position for expediting the commercialization of the company's battery and hydrogen sensors. We see Insplorion's success with battery sensors as an indicator of the interest in these sensors and their imminent commercialization by around 2023. This will be followed by the company's hydrogen sensors, which reach the market by 2025 at the earliest.

We expect volume sales of battery sensors to be commercialized through a licensing agreement with a Tier-1 automotive industry supplier, while Insplorion directly processes end customers and that a certain volume of sensors will be proprietarily manufactured (up to about 1 million sensors in 2028). We estimate that licensing deals will average at a price of USD 2.6 per sensor and that Insplorion will receive 10 percent in license-based revenues per sensor. At this price, relative to the BMS, the number of sensors accounts for about 12.2 percent of the system's cost.²⁹ We consider the rate of 12.2 percent of the system's overall cost to be conservative, as we expect price sensitivity to be modest relative to the commercial, political and environmental gains, which supports the case for a premium.

Cost factors

The general cost factors for Insplorion and the cost per sensor will vary depending on the type of strategy that Insplorion chooses to adopt. Insplorion can sell its technology directly to end customers, or provide licensing to an exclusive partner or general licenses to several partners.

Direct sales to end customers

In the event of direct sales to potential end customers, Insplorion will need to invest in a sales organization, build up manufacturing capacities and bear the cost of production. We believe that a combination of licensing deals and proprietary sales will be the way forward.

In the event of direct sales to end customers, we estimate that the cost per sensor will be USD 0.5 of the sales price (50 percent gross profit margin). We estimate that the price in direct sales will be around USD 1.0, given that customers have a negotiation advantage from their company size and volume. With this in mind, we estimate that Insplorion will only produce about 1 million sensors in 2028, and up to 3.9 million sensors by 2035, with the aim of strengthening its commercial and R&D position, in combination with its licensing deals.

Sales through partners

In light of the cooperation and sales that transpired with the German vehicle manufacturer during the year, we expect a minor licensing deal to result in a breakthrough deal for battery sensors by no earlier than 2023.

²⁹ Battery system USD 3,200, 150 sensors per battery system, price per sensor USD 2.6. $\text{USD } 390 / 3,200 = 12.2$ percent of the battery system

For example, such a licensing deal would be incorporated in the Volkswagen ID.3, 56,500 units of which were sold in 2020. As additional license partners are successfully secured, we can expect an upscaling of sensors, from being included in 12,600 cars to 400,000 cars in 2027. It is estimated that the number of EVs sold in 2025 will be 14 million. We estimate that Insplorion's sensors will be placed in about 400,000 cars by 2027, which corresponds to 3 percent of the total sensor market within EVs, based on a car containing 150 sensors for monitoring battery cells.

Valuation

Our valuation analysis of Insplorion proceeds from a Discounted Cash Flow (DCF) model. We have analyzed three scenarios with a WACC of 18.3 percent in our calculation of the valuation range of SEK 18–34 per share.

DCF

Base scenario – reasonable value SEK 25

We have created an annual forecast for period from 2021 to 2035. The valuation model proceeds from the assumption that Insplorion secures license agreements from the commercialization of its technology for volume production. We consider Insplorion's opportunities to be good, in light of the company's progress over the past year and its close collaboration with potential customers in important projects, which we believe will bear fruit in the foreseeable future.

In our Base scenario, we expect Insplorion to secure a licensing agreement for battery sensors by no earlier than 2023. We consider the collaboration with the German vehicle manufacturer and their purchase of the test instrument as validation of Insplorion's technology and that this will form a basis for Insplorion's revenues in 2023.

For example, such a licensing deal would be incorporated in the Volkswagen ID.3, 56,500 units of which were sold in 2020. We expect an upscaling of sensors, from being included in 12,600 cars to 400,000 cars in 2027, through the successful connection of additional license partners and the expansion of vehicle models. We estimate that Insplorion's technology will be present in 1 million cars by 2031 and up to 1.8 million cars by 2035, supported by the acute shift from internal combustion engines to EVs and plug-in hybrids.

For the company's hydrogen sensors, we expect a minor license agreement within fuel cells to be secured by no earlier than 2025. A general assumption is that this industry vertical is further away in time, compared with the company's battery sensors. However, the collaboration with Powercell is promising and provides the basis for future developments towards commercialization.

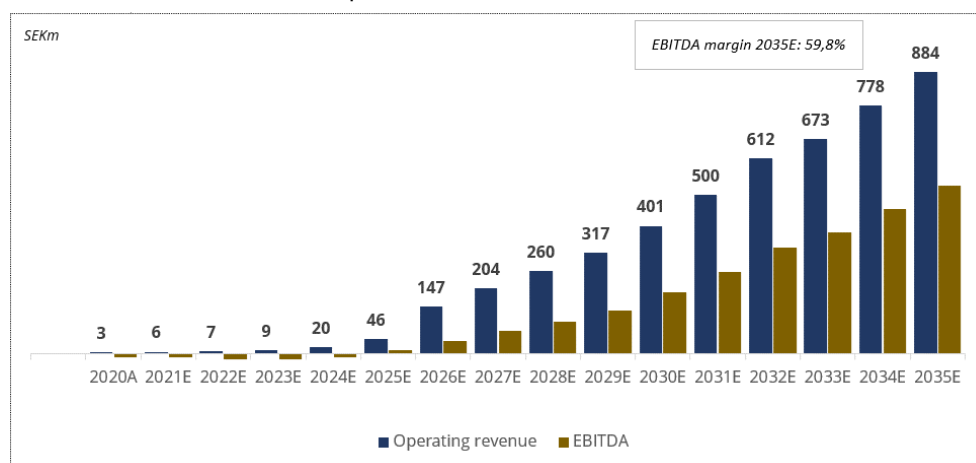


Image: Sales & EBITDA 2020A–2035E

We expect that over time, Insplorion will produce a smaller volume (approximately 1–2 percent) of their own sensors to ensure control of IP rights and to enable efficient penetration with respect to additional fields of application. We expect that the absolute majority (98–99 percent) of sensors will be produced via licensees and that in the long term, Insplorion will maintain an asset-light business model with wide gross margins (> 90 percent) and minimal tied-up capital (operational working capital in relation to sales of less than 15 percent).

Analysis	Hist. 2020	Proj. 2021	Proj. 2022	Proj. 2023	Proj. 2024	Proj. 2025	Proj. 2026	Proj. 2027	Proj. 2028	Proj. 2029	Proj. 2030	Proj. 2031	Proj. 2032	Proj. 2033	Proj. 2034	Proj. 2035
Growth																
Sales	nm	93%	26%	27%	119%	134%	219%	38%	28%	22%	27%	25%	23%	10%	16%	14%
EBITDA	nm	neg	49%	6%	neg	neg	298%	80%	37%	37%	41%	33%	30%	15%	19%	17%
EBIT	nm	19%	42%	6%	neg	neg	734%	84%	36%	38%	44%	35%	32%	15%	20%	17%
CFO	nm	19%	32%	neg	neg	neg	neg	428%	33%	34%	41%	neg	119%	16%	18%	17%
Net income	nm	19%	42%	6%	neg	neg	982%	87%	37%	39%	44%	35%	32%	15%	20%	17%
Profitability																
Gross margin	83,3%	89,7%	79,6%	79,3%	90,2%	92,3%	93,8%	93,9%	94,0%	94,1%	94,1%	94,2%	94,2%	94,2%	94,2%	94,20%
EBITDA margin	neg	neg	neg	uy	neg	21,9%	27,4%	35,5%	38,0%	42,9%	47,7%	51,0%	54,2%	56,6%	58,2%	59,8%
EBIT margin	neg	neg	neg	neg	neg	8,8%	23,0%	30,6%	32,6%	37,0%	42,0%	45,4%	48,8%	50,9%	52,6%	54,3%
Net income margin	neg	neg	neg	neg	neg	5,1%	17,4%	23,5%	25,1%	28,6%	32,6%	35,3%	38,0%	39,6%	40,9%	42,2%

Image: Key metrics under the Base scenario

With the transformation of the automotive industry, Volvo Cars, for example, has announced that in 2025, 50 percent of its car fleet will consist of EV alternatives, including plug-in hybrids (equivalent to about 600,000 vehicles). We expect that Insplorion will have a significant role in that ecosystem and succeed in generating growth through the accelerated growth that is taking place within the EV market.

Insplorion is a company with a focus on R&D, which we expect to continue into the future. We estimate that about 15 percent of long-term turnover will comprise R&D investments aimed at maintaining a cutting-edge position in existing and new industry verticals.

Insplorion has historically financed development through grants and new share issues. Bearing in mind the sharp growth that we described in the market section within the EV segment, and that Insplorion has cutting-edge technology, we deem that conditions are conducive for Insplorion to receive SEK 20 million in additional grants and/or loan financing in 2024, which, together with existing funds, will finance operations until 2024 and later.

DCF - Base scenario, SEKm		Model assumptions and for calc. of terminal value																
Sum of PV of FCF	109	WACC	18,3%															
PV of Terminal Value (2035E-)	164	Sales growth rate (2035E-)	2,0%															
Enterprise Value	273	Gross profit long term %	94,2%															
+/- Net Debt	-48	EBITDA margin for terminal value calculation	59,8%															
Equity Value	321	Depreciation (% of sales)	0,0%															
No. of shares outstanding (m)	13	Amortization (% of sales)	5,6%															
Price per share, SEK	25	Capex (% of sales)	8,6%															
		Working capital change (% of sales)	1,7%															
		Tax Rate	22,0%															

DCF - Base scenario	Hist.	Proj.	Proj.	Proj.	Proj.	Proj.	Proj.	Proj.	Proj.	Proj.	Proj.	Proj.	Proj.	Proj.	Proj.	Proj.	Proj.	Proj.
SEKm	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	Steady state	
Operating revenue	2,9	5,6	7,1	9,0	19,8	46,2	147,2	203,6	260,1	316,7	401,1	499,6	612,1	673,5	778,4	883,7	901,3	
Capitalized expenses	4,6	3,2	4,5	5,0	7,0	8,1	24,4	29,7	36,4	40,5	46,5	54,0	61,2	63,3	70,1	76,0	77,5	
Total Revenue	7,5	8,9	11,6	14,0	26,8	54,4	171,7	233,3	296,5	357,2	447,7	553,5	673,3	736,8	848,5	959,7	978,9	
COGS	-0,5	-0,6	-1,4	-1,9	-1,9	-3,5	-9,2	-12,3	-15,5	-18,8	-23,6	-29,1	-35,4	-39,1	-45,1	-51,3	-52,3	
Gross profit	7,0	8,3	10,1	12,1	24,9	50,8	162,5	221,0	280,9	338,4	424,1	524,4	637,9	697,7	803,4	908,4	926,5	
EBITDA	-12,2	-11,9	-17,8	-18,9	-10,3	10,1	40,3	72,4	98,9	135,7	191,5	254,7	331,8	381,2	453,1	528,4	539,0	
Depreciation	-0,4	-0,6	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
Amortization	0,0	0,0	0,0	0,0	-5,8	-6,1	-6,5	-10,1	-14,0	-18,5	-22,9	-27,6	-32,9	-38,6	-43,5	-48,8	-50,6	
EBIT	-12,6	-12,5	-17,8	-18,9	-16,2	4,1	33,8	62,3	84,9	117,3	168,6	227,0	298,9	342,6	409,6	479,6	488,4	
EBIT(1-Tax)	-12,6	-12,5	-17,8	-18,9	-16,2	1,8	24,9	46,4	63,1	87,4	126,4	171,0	225,9	258,8	309,9	363,3	369,8	
Depreciation	0,4	0,6	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
Amortisation	0,0	0,0	0,0	0,0	5,8	6,1	6,5	10,1	14,0	18,5	22,9	27,6	32,9	38,6	43,5	48,8	50,6	
Change in working capital etc	7,1	0,0	-0,4	0,0	4,2	4,9	-31,3	-8,5	-8,5	-8,5	-12,7	-14,8	-16,9	-9,2	-15,7	-15,8	-15,6	
Capital expenditure	-4,7	-3,2	-4,5	-5,0	-7,0	-8,1	-24,4	-29,7	-36,4	-40,5	-46,5	-54,0	-61,2	-63,3	-70,1	-76,0	-77,5	
Free cash flow (FCF)	-9,8	-15,1	-22,6	-23,8	-13,2	4,7	-24,3	18,3	32,2	56,9	90,1	129,9	180,7	224,8	267,6	320,4	327,3	
Present Value of FCF		-12,9	-16,4	-14,6	-6,8	2,0	-9,0	5,7	8,5	12,7	17,0	20,7	24,4	25,6	25,8	26,1		
Sum of PV of FCF		108,9																

Image: DCF Base scenario

Conservative scenario – SEK 18

In comparison with our Base scenario, we still expect Insplorion to secure a license agreement for battery sensors in 2023, but upscaling towards volume production will take longer.

We expect that the company's products will be present in 400,000 cars by around 2030 (compared with 2027 in the Base scenario), and in 1.5 million cars by 2035. We also expect a shift in hydrogen operations, which will not gain momentum until 2026.

Relative to the Base scenario, a shift in the establishment of battery sensors will impact P&L, with about 50 percent in less sales during 2027–2030.

Income Statement	Hist.	Proj.	Proj.	Proj.	Proj.	Proj.	Proj.	Proj.	Proj.	Proj.	Proj.	Proj.	Proj.	Proj.	Proj.	Proj.	Proj.	Proj.
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035		
Operating revenue	2,9	5,6	7,1	9,0	19,8	43,8	64,3	88,7	131,4	159,9	230,7	287,2	351,7	467,7	599,8	748,1		
Capitalized expenses	4,6	3,2	4,5	5,0	7,0	7,7	10,7	12,9	18,4	20,5	26,8	31,0	35,2	44,0	54,0	64,3		
Total Revenue	7,5	8,9	11,6	14,0	26,8	51,5	75,0	101,6	149,8	180,4	257,4	318,2	386,9	511,6	653,7	812,4		

Image: Summary av sales in the Conservative scenario

DCF - Conservative scenario, SEKm		Model assumptions and for calc. of terminal value															
Sum of PV of FCF	49	WACC															
PV of Terminal Value (2035E-)	132	Sales growth rate (2035E-)															
Enterprise Value	181	Gross profit long term %															
+/- Net Debt	-48	EBITDA margin for terminal value calculation															
Equity Value	230	Depreciation (% of sales)															
No. of shares outstanding (m)	13	Amortization (% of sales)															
Price per share, SEK	18	Capex (% of sales)															
		Working capital change (% of sales)															
		Tax Rate															

DCF - Conservative scenario	Hist.	Proj.	Proj.	Proj.	Proj.	Proj.	Proj.	Proj.	Proj.	Proj.	Proj.	Proj.	Proj.	Proj.	Proj.	Proj.	Proj.
SEKm	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	Steady state
Operating revenue	2,9	5,6	7,1	9,0	19,8	43,8	64,3	88,7	131,4	159,9	230,7	287,2	351,7	467,7	599,8	748,1	763,0
Capitalized expenses	4,6	3,2	4,5	5,0	7,0	7,7	10,7	12,9	18,4	20,5	26,8	31,0	35,2	44,0	54,0	64,3	65,6
Total Revenue	7,5	8,9	11,6	14,0	26,8	51,5	75,0	101,6	149,8	180,4	257,4	318,2	386,9	511,6	653,7	812,4	828,6
COGS	-0,5	-0,6	-1,4	-1,9	-1,9	-3,3	-4,6	-6,1	-8,6	-10,3	-14,4	-17,7	-21,5	-28,1	-35,6	-44,0	-45,9
Gross profit	7,0	8,3	10,1	12,1	24,9	48,2	70,4	95,5	141,2	170,1	243,1	300,5	365,4	483,6	618,2	768,4	782,7
EBITDA	-12,2	-11,9	-17,8	-18,9	-10,3	9,6	17,0	30,8	49,2	67,7	109,3	145,4	189,6	263,8	348,3	446,7	455,7
Depreciation	-0,4	-0,6	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Amortization	0,0	0,0	0,0	0,0	-5,8	-6,1	-6,4	-7,3	-8,4	-10,4	-12,4	-15,3	-18,4	-21,8	-26,2	-31,8	-33,8
EBIT	-12,6	-12,5	-17,8	-18,9	-16,2	3,5	10,6	23,5	40,8	57,3	96,8	130,1	171,1	242,0	322,1	415,0	421,9
EBIT(1-Tax)	-12,6	-12,5	-17,8	-18,9	-16,2	1,4	6,8	16,7	30,0	42,4	72,8	98,1	129,4	184,0	245,4	316,7	321,7
Depreciation	0,4	0,6	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Amortisation	0,0	0,0	0,0	0,0	5,8	6,1	6,4	7,3	8,4	10,4	12,4	15,3	18,4	21,8	26,2	31,8	33,8
Change in working capital etc	7,1	0,0	-0,4	0,0	4,2	4,4	-18,4	-3,7	-6,4	-4,3	-10,6	-8,5	-9,7	-17,4	-19,8	-22,2	-25,4
Capital expenditure	-4,7	-3,2	-4,5	-5,0	-7,0	-7,7	-10,7	-12,9	-18,4	-20,5	-26,8	-31,0	-35,2	-44,0	-54,0	-64,3	-65,6
Free cash flow (FCF)	-9,8	-15,1	-22,6	-23,8	-13,2	4,2	-15,9	7,4	13,6	28,1	47,9	73,9	103,0	144,4	197,9	261,9	264,4
Present Value of FCF		-12,9	-16,4	-14,6	-6,8	1,8	-5,9	2,3	3,6	6,3	9,0	11,8	13,9	16,5	19,1	21,3	
Sum of PV of FCF		49,0															

Image: DCF Conservative-scenario

Confident scenario – SEK 34

In our optimistic scenario, we expect Insplorion to seize a larger share of the market faster. We expect Insplorion to secure a license agreement for battery sensors around 2023 and for them to be included in a larger volume (42,000 cars) to reach about 400,000 cars by 2026. In the long term, we expect Insplorion's products to be included in 2.8 million cars by 2035. We also expect growth in the hydrogen business area to further accelerate, when the collaboration with Powercell and the company's hydrogen sensors begin to generate license revenues from fuel cells by 2023.

Furthermore, we expect that Insplorion will need to expedite the expansion of its organization and that Insplorion will finance increases in tied-up capital by raising loans of SEK 35 million in 2026.

DCF - Confident scenario, SEKm				Model assumptions and for calc. of terminal value														
Sum of PV of FCF	146			WACC	18,3%													
PV of Terminal Value (2035E-)	250			Sales growth rate (2035E-)	2,0%													
Enterprise Value	397			Gross profit long term %	94,3%													
+/- Net Debt	-48			EBITDA margin for terminal value calculation	60,0%													
Equity Value	445			Depreciation (% of sales)	0,0%													
No. of shares outstanding (m)	13			Amortization (% of sales)	5,4%													
Price per share, SEK	34			Capex (% of sales)	8,6%													
				Working capital change (% of sales)	2,0%													
				Tax Rate	22,0%													

DCF - Confident scenario	Hist.	Proj.	Proj.	Proj.	Proj.	Proj.	Proj.	Proj.	Proj.	Proj.	Proj.	Proj.	Proj.	Proj.	Proj.	Proj.	Proj.	Steady state
SEKm	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035		
Operating revenue	2,9	5,6	7,1	22,9	69,4	149,6	210,1	290,5	371,1	451,9	572,4	712,9	873,4	1034,2	1195,3	1356,7	1383,9	
Capitalized expenses	4,6	3,2	4,5	12,6	24,7	26,3	34,9	42,4	52,0	57,8	66,4	77,0	87,3	97,2	107,6	116,7	119,0	
Total Revenue	7,5	8,9	11,6	35,4	94,1	175,9	245,0	333,0	423,1	509,8	638,8	789,9	960,8	1131,4	1302,9	1473,4	1502,9	
COGS	-0,5	-0,6	-1,4	-2,6	-4,8	-9,2	-12,6	-17,1	-21,6	-26,1	-32,8	-40,6	-49,5	-58,4	-67,5	-76,6	-78,3	
Gross profit	7,0	8,3	10,1	32,8	89,3	166,7	232,4	315,9	401,5	483,6	606,0	749,3	911,3	1073,0	1235,4	1396,8	1424,5	
EBITDA	-12,2	-11,9	-17,8	-45,7	-34,2	35,1	58,0	103,8	141,7	194,4	274,0	364,4	474,6	586,9	697,5	813,4	829,6	
Depreciation	-0,4	-0,6	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
Amortization	0,0	0,0	0,0	0,0	-7,4	-10,8	-13,9	-18,1	-23,0	-28,8	-34,6	-41,0	-48,2	-56,0	-64,2	-72,9	-74,6	
EBIT	-12,6	-12,5	-17,8	-45,7	-41,6	24,2	44,1	85,7	118,8	165,7	239,4	323,4	426,4	530,9	633,3	740,5	755,1	
EBIT(1-Tax)	-12,6	-12,5	-17,8	-45,7	-41,6	16,5	31,3	62,8	87,6	122,9	179,2	243,2	322,0	401,8	479,8	561,5	572,6	
Depreciation	0,4	0,6	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
Amortisation	0,0	0,0	0,0	0,0	7,4	10,8	13,9	18,1	23,0	28,8	34,6	41,0	48,2	56,0	64,2	72,9	74,6	
Change in working capital etc	7,1	0,0	-0,4	0,3	14,8	14,6	-61,4	-12,1	-12,1	-12,1	-18,1	-21,1	-24,1	-24,1	-24,1	-24,2	-28,3	
Capital expenditure	-4,7	-3,2	-4,5	-12,6	-24,7	-26,3	-34,9	-42,4	-52,0	-57,8	-66,4	-77,0	-87,3	-97,2	-107,6	-116,7	-119,0	
Free cash flow (FCF)	-9,8	-15,1	-22,6	-57,9	-44,1	15,7	-51,1	26,5	46,5	81,7	129,3	186,1	258,8	336,4	412,3	493,5	499,8	
Present Value of FCF	-12,9	-16,4	-35,4	-22,8	6,9	-18,9	8,3	12,3	18,2	24,4	29,7	34,9	38,4	39,7	40,2			
Sum of PV of FCF	146,5																	

Image: DCF Confident scenario

Risk factors

Risks pertaining to Insplorion can be divided into business-related and industry-related, legal and financial risks.

Business-related and industry-related risks

Insplorion operates in a competitive environment. Some of the company's competitors may have stronger financial conditions that allow for them to respond more quickly to new specific customer needs. There are also factors beyond the influence of Insplorion, such as if the market for air-quality sensors, hydrogen sensors, battery sensors and research instruments were to develop in a direction unfavorable to Insplorion, due to a change in behavior among end customers. There is also a risk that battery manufacturers will choose to roll out Insplorion's technology at a slower pace than expected, which would postpone the accelerated growth linked to the EV market.

Legal risks




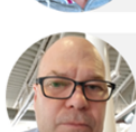

Legal risks pertain to the company's intellectual property rights, patents and other intellectual property rights. Consequently, the company's operations and potential future successes are largely dependent on the possibility of maintaining existing patent protection for ongoing and future commercialization.

Financial risks





Since its founding, Insplorion's operations have been generating a negative operating profit and it cannot be ruled out that it will take longer than expected for the company to achieve a positive cash flow. Nor can it be ruled out that the company will have greater capital requirements in the future than what is currently deemed necessary.

Corporate governance and ownership structure

Insplorion's Board of Directors

	Jonas Ehinger <i>Chairman of the board since 2020</i>	Background: Jonas holds an M.Sc. With a focus on biochemistry / chemistry from the University of Gothenburg. Since 2010, he has been CEO of Osstell AB, a global company that develops, manufactures and distributes diagnostic products for stability measurements in dental implants. Jonas has 20 years of experience as CEO and has previously been CEO of Cellectron and Mentice. Other ongoing assignments: Chairman of the Board of Gapwaves AB, Board member of Doxa AB and Leading Light AB.	Holding: 5000 shares
	Jan Burenius <i>Board member since 2016</i>	Background: Jan has a master's degree in engineering from the University of Gothenburg. Jan has almost 50 years of international experience in various management positions within Volvo, Gränges and Nobel. Through his consulting company Nimba, Jan has supported customers such as ABB, AstraZeneca, Ericsson, ESAB, ITT, Nokia, Volvo and others. Other ongoing assignments: CEO and board member of Nimba AB. Chairman of the Board of ATIUM AB and OpenHack C4H (svb). Deputy board member of Burneus and Partners AB.	Holding: 19 878 shares
	Ulla-Britt Fräjdin Hellqvist <i>Board member since 2018</i>	Background: Ulla-Britt has a master's degree in technical physics from Chalmers University of Technology and has been a member of the Royal Swedish Academy of Engineering Sciences (IVA) since 2004. She has 29 years of experience from working in listed, private and state-owned companies, including as Chairman of the board of Kongsberg Automotive, ASA, SinterCast AB and others. She spent 22 years at Volvo Cars including as Head of Quality at Volvo Monitoring and Concept Center CA, USA. Other ongoing assignments: CEO and board member of Fräjdin & Hellqvist AB, board member of Triborn International AB and others.	Holding: 12 850 shares
	Anders Sandell <i>Board member since 2020</i>	Background: Anders has a master's degree in engineering from Halmstad University. Since 2008, he has been the CEO of Holmbergs Safety Systems Holding AB, which is active in child safety. Before Holmbergs, Anders worked as marketing and product manager within Electrolux and Huskvarna with residence in Asia and Japan. Other ongoing assignments: CEO and Chairman of the Board of Holmbergs Safety System Holding AB. Chairman of the Board of Holmbergs Digital Safety AB, Holmbergs Safety Ltd and Fasching Salzburg GmbH.	Holding: 5000 shares
	Magnus Jonsson <i>Board member since 2021</i>	Background: Magnus is a civil engineer from Chalmers University of Technology in Gothenburg. Magnus has extensive experience from SAAB and Volvo with a focus on product development, design and technology. Magnus has been Senior Vice President in product development at Volvo Cars. Magnus has broad operational and strategic experience of working in complex and global business areas. Other ongoing assignments: Chairman of the Board of PowerCell, AstraZero and Bil Sweden. Magnus is also a board member of SmartEyes AB, Nilsson Special Vehicles, Gapwaves AB and Leading Light AB.	Holding:

Insplorion's management

	Patrik Dahlqvist <i>CEO since 2013</i>	Background: Patrik has a master's degree in chemical engineering from Chalmers University of Technology. Patrik has a broad experience of entrepreneurial companies and companies with instrument sales. Patrik has previously been CEO of Medfield Diagnostics, where he built the company from technology in stroke diagnostics to a successful company that was listed on Aktietorget in 2021. Other ongoing assignments: CEO and board member of Insplorion Sensor Systems AB, Gaut Enterprise AB and Integrity AB. Board member of Sweaty Beards Film AB and Sigilo Solutions AB.	Holdings: 146 424 shares
	Elin Larsson Langhammer <i>Founder and CTO since 2010</i>	Background: Elin has a master's degree in technical biology from Linköping University and a doctorate in philosophy in materials science from Chalmers University of Technology, with NPS technology as her research area. Elin is one of the founders of Insplorion and is currently responsible for the development of sensors and IP protection. Elin has previously been a researcher at the competence center Katalys at Chalmers. Other ongoing assignments: Board member of MPS & Affärssystem AB.	Holdings: 176 030 shares
	Olof Andersson <i>In charge of production and development since 2018</i>	Background: Olof is a Doctor of Technology in sensor science from Linköping University and is responsible for the product development of instruments and sensor modules, especially the company's department for gas sensors. Olof is also trained in nanofabrication and biosensors and has previous industry experience as responsible for the development of research instruments and analysis techniques. Olof is independent in relation to the company's major owners. Other ongoing assignments: -	Holdings:
	Per Giljam <i>In charge of production and development since 2018</i>	Background: Per has a master's degree in economics from Handelshögskolan at Göteborgs University. Per has previously worked as a Business Controller at Vitrolife and in auditing at PwC. Per is responsible for financial management, reporting to the market and supports the company's Business Units. Per is independent in relation to the company's major owners. Other ongoing assignments: -	Holdings:

Ownership structure

Shareholders	Number of shares	% of capital and votes
Avanza Pension	11 065 09	8,46%
Formue Nord A/S	528 670	4,04%
Mikael Hägg	499 292	3,82%
AP Ventures	450 000	3,44%
Hans-Olov Olsson	408 483	3,12%
Stiftelsen Chalmers Tekniska Högskola	382 862	2,93%
Nordnet Pension	335 529	2,56%
Gunvald Berger	280 389	2,14%
Lena Kasemo	247 529	1,89%
Hawoc Investment AB	200 000	1,53%
Övriga	8 645 681	66,07%
Totalt	13 084 944	100,00%

Financial information

Income statements 2020–2035E

	Hist.	Proj.	Proj.	Proj.	Proj.	Proj.
<i>Income Statement (SEKm)</i>	<i>2020</i>	<i>2021</i>	<i>2022</i>	<i>2023</i>	<i>2024</i>	<i>2025</i>
Operating revenue	2,9	5,6	7,1	9,0	19,8	46,2
Capitalized expenses	4,6	3,2	4,5	5,0	7,0	8,1
Total Revenue	7,5	8,9	11,6	14,0	26,8	54,4
COGS	-0,5	-0,6	-1,4	-1,9	-1,9	-3,5
Gross profit	7,0	8,3	10,1	12,1	24,9	50,8
Sales and marketing	-8,9	-10,7	-13,5	-14,5	-15,8	-18,5
Logistics	0,0	0,0	-0,2	-0,3	-0,6	-1,4
Technology costs	0,0	0,0	0,0	-0,9	-3,0	-6,9
General and Admin	-10,3	-9,5	-14,2	-15,4	-15,8	-13,9
EBITDA	-12,2	-11,9	-17,8	-18,9	-10,3	10,1
Depreciation	-0,4	-0,6	0,0	0,0	0,0	0,0
Amortization	0,0	0,0	0,0	0,0	-5,8	-6,1
EBIT	-12,6	-12,5	-17,8	-18,9	-16,2	4,1
Minority interest	0,0	0,0	0,0	0,0	0,0	0,0
Net interest income / expense	-0,2	-0,2	-0,2	-0,2	-0,6	-1,0
PBT	-12,8	-12,7	-18,0	-19,1	-16,8	3,0
Tax expense	0,0	0,0	0,0	0,0	0,0	0,0
Net income	-12,8	-12,7	-18,0	-19,1	-16,8	2,4
Ratios						
Sales growth	nm	93%	26%	27%	119%	134%
Gross margin	83%	90%	80%	79%	90%	92%
EBITDA margin	neg.	neg.	neg.	neg.	neg.	19%

Balance sheet 2020–2025E

	Hist. 2020	Proj. 2021	Proj. 2022	Proj. 2023	Proj. 2024	Proj. 2025
Balance Sheet (SEKm)						
<i>Current Assets</i>						
Cash and cash equivalents	67,9	52,9	33,0	12,9	20,7	38,5
Non-cash current assets	1,1	2,4	3,5	4,5	5,9	13,9
Total Current Assets	69,0	55,3	36,5	17,4	26,7	52,4
<i>Non-current Assets</i>						
Net PP&E	0,6	0,0	0,0	0,0	0,0	0,0
Intangible assets	16,6	19,8	24,3	29,2	30,4	32,5
Other assets	1,5	1,5	1,5	1,5	1,5	1,5
Total Non-Current Assets	18,6	21,3	25,7	30,7	31,9	33,9
Total Assets	87,6	76,6	62,3	48,1	58,5	86,3
<i>Liabilities</i>						
Short-term debt	2,2	2,2	2,2	2,2	2,2	2,2
Non-debt current liabilities	1,6	2,9	3,7	4,7	10,3	23,1
Other long-term liabilities	10,9	11,3	14,2	18,1	19,8	32,4
Long-term debt	2,3	2,3	2,3	2,3	22,3	22,3
Tax liability	0,0	0,0	0,0	0,0	0,0	0,0
Total Liabilities	17,0	18,7	22,4	27,3	54,6	80,0
<i>Equity</i>						
Capital	123,4	123,4	123,4	123,4	123,4	123,4
Retained earnings	-52,8	-65,5	-83,5	-102,6	-119,4	-117,0
Total Equity	70,6	57,9	39,9	20,8	4,0	6,3
Total Liabilities & Equity	87,6	76,6	62,3	48,1	58,5	86,3

Cash flow statement 2020–2025E

	Hist. 2020	Proj. 2021	Proj. 2022	Proj. 2023	Proj. 2024	Proj. 2025
Cash Flow (SEKm)						
Net Income	-12,8	-12,7	-18,0	-19,1	-16,8	2,4
Depreciation	0,4	0,6	0,0	0,0	0,0	0,0
Amortization	0,0	0,0	0,0	0,0	5,8	6,1
(Inc) dec in operating working capital	7,1	0,0	-0,4	0,0	4,2	4,9
Inc (dec) other long-term liabilities	0,0	0,4	2,9	3,9	1,7	12,6
(Inc) dec in other long-term assets	0,0	0,0	0,0	0,0	0,0	0,0
Cash Flow from Operations	-5,3	-11,7	-15,5	-15,2	-5,1	25,9
Capital expenditure	-0,2	0,0	0,0	0,0	0,0	0,0
Capitalized expenses	-4,6	-3,2	-4,5	-5,0	-7,0	-8,1
Cash Flow from Investing	-4,7	-3,2	-4,5	-5,0	-7,0	-8,1
Inc (dec) in long-term debt	-0,1	0,0	0,0	0,0	20,0	0,0
Inc (dec) in capital	54,3	0,0	0,0	0,0	0,0	0,0
Dividends	0,0	0,0	0,0	0,0	0,0	0,0
Cash Flow from Financing	54,2	0,0	0,0	0,0	20,0	0,0
Net Cash Flow	44,2	-15,0	-19,9	-20,1	7,9	17,8
Cash balance beginnig of year	23,7	67,9	52,9	33,0	12,9	20,7
Cash balance end of year	67,9	52,9	33,0	12,9	20,7	38,5

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Conflict of interest

Name	Owns shares in Insplorion (Yes/No)	No. of shares
Naventus Corporate Finance AB	Yes	35,000

Naventus performs/has performed services for Insplorion and receives/has received compensation from Insplorion in connection with the said services.



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