

Initial Research

2019-07-04

Heliospectra: Making waves in the greenhouse

- Crop-optimising LED lighting solutions for horticulture
- Industry-leading versatility and control of lights
- A vast, nearly untapped market in food growers

Responsible analyst

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Stock ticker: HELIO
Industry: Electrical equipment
Listed on: Nasdaq First North
Latest stock price (SEK): 6,45
Market cap (MSEK): 302,0
Enterprise Value (MSEK): 300,6
Total number of shares (M): 46,82
- of which free float (M): 23,20

VHCF fair value per share

DCF model 6,20 - 9,60 SEK

Heliospectra AB

Address: Fiskhammsgatan 2
414 58 Göteborg
Webpage: heliospectra.com
CEO: Ali Ahmadian

Main owners (31 May 2019)

Capital (%)

Weland Värdepapper AB	22,5
Weland Stål AB	16,5
Midroc New Technology AB	11,5
ADMA Förvaltnings AB	9,4
Avanza Pension	4,4

Stock price history



	-1m	-3m	-12m
Change (%)	12,1	41,7	-17,7
52 w k range (Low /Hi) - SEK		4,42 / 9,64	

Source: FactSet

Heliospectra has developed LED-based lighting solutions that optimise crop performance by securing that plants get just the right quality and quantity of light. The equipment enables the customer to increase yields, improve product quality, raise consistency of output and save money and resources. A number of megatrends play in the company's favour, including population growth, urbanisation, demand for organic foods and care for the environment.

The company has also benefitted from the wave of cannabis legislation sweeping across the world. Heliospectra sees strong demand from licensed cannabis growers, not least in Canada where it is setting up a subsidiary. But longer-term, we see a vastly bigger market opportunity among food growers. Even a tiny market share in greenhouse lighting for food production could add up to significant revenues on a 5 to 10-year horizon.

In our economic scenario, we have modelled a significant acceleration of revenues starting 2020 and expect to see growing profits beginning in the latter half of 2021. Free cash flow turns positive around the same time. Before then, we could see another SEK 35 million equity issue next year, to bridge the final gap before the company becomes self-financing.

We have valued the company using a DCF model and estimate a fair value per share for the present situation at SEK 6.20 – 9.60. The valuation takes into account our assessment of risk, especially the risks associated with being active in a young business under establishment. We monitor the risk continuously, and further progress towards sustainable profits will, all else equal, allow us to raise the valuation down the line.

Table 1: Financial Overview

MSEK	2 018	2019e	2020e	2021e	2022e
Total revenues	46,0	50,6	101,4	185,7	315,2
Growth (%)	25,1%	10,0%	100,3%	83,2%	69,7%
EBITDA	(30,5)	(34,7)	(20,3)	4,0	41,6
EBITDA margin (%)	neg	neg	neg	2,2%	13,2%
EBT	(33,3)	(38,3)	(24,2)	(0,3)	36,9
Cash holdings	11,2	11,6	13,5	3,3	33,7
Total assets	40,2	48,4	73,0	96,5	170,8
Total equity	15,2	26,2	37,0	36,7	73,6
Solidity (%)	37,9%	54,2%	50,8%	38,1%	43,1%
P/E	neg	neg	neg	neg	8,2
ROE	neg	neg	neg	neg	50,1%
EV/EBIT (x)	neg	neg	neg	neg	8,1
EV/Sales (x)	6,5	5,9	3,0	1,6	1,0

Source: Västra Hamnen Corporate Finance

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The right light for every crop

What does Heliospectra do?

Heliospectra AB develops, markets and sells advanced lighting solutions for horticulture. Its intelligent LED light fixtures and control systems provide crops with just the right lighting for optimal plant development, in terms of wavelength, intensity and duration of light. The lighting can be customised to best benefit the individual crop and whatever plant feature the grower wants to emphasise. This will enable the customer to increase yields, improve product quality, raise consistency of output and save money and resources.

From its headquarters in Gothenburg and via local sales teams in the USA and Canada, the company is addressing a growing global market of food producers, medicinal plants growers and “AgTech” organisations. AgTech signifies research in agricultural technology by both academic and commercial enterprises.

Lighting solutions based on LED technology form the centre of Heliospectra’s offering. In addition to light fixtures, Heliospectra offers intelligent management software connecting up to 2 000 individual lights, a system currently marketed as HelioCORE. Further leverage to the business model was added with the recent launch of a suite of consulting services. In the future, the addition of advanced crop monitoring will provide huge amounts of data which can be mined for ever better crop enhancement strategies.

Megatrends support the business model

Several global megatrends play in Heliospectra’s favour:

- Population growth and urbanisation mean increasing demand for food, while the supply of arable land is becoming scarce. This makes it all the more important to optimise yields from the available land.
- Urban customers increasingly demand locally produced foods, which drives the development towards unconventional grow areas such as indoors.
- The demand for organic, pesticide-free crops increases the attraction of growing indoors in a fully controlled environment.
- Environmental as well as economic concerns motivate a switch from traditional lighting to smart, energy-efficient LED solutions.
- The wave of cannabis legalisation is opening a large new market where indoor farming and artificial lighting is the norm.

The LED advantage

A lot of modern agriculture relies on artificial lighting. Greenhouses are fitted with artificial lighting to boost plant development, especially in seasons when natural daylight is scarce. Traditionally, greenhouse developments have used the cheapest source of light, high pressure sodium (HPS) lamps. This is the same lighting technology as in streetlights and it shines in the familiar yellowish tones. HPS lamps are cheap to install but compared with modern LED lamps, they are inefficient in supplying the kind of light that benefits growing plants.

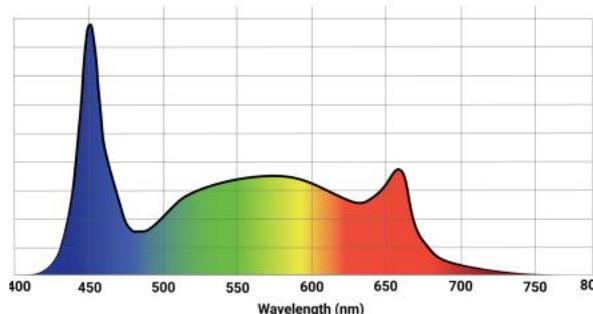
LED saves energy and therefore costs

LED lamps are more expensive to install but make up for this over time by being much more energy-efficient than HPS. LED converts more of the energy into light and less into heat, thus also saving energy by reducing the need for cooling the greenhouse. Cooler lamps also mean that the light source can be placed closer to the plants without risk of overheating them. This allows for more compact grow facilities.

The light spectrum affects a plant's features

The biggest advantage of smart LED is however that it enables precise control of what spectrum of light to shine on the crops. By spectrum we mean the intensity of light at different wavelengths. HPS lamps have a fixed spectrum that is highly concentrated in the yellow tones. This makes them a poor substitute for natural sunshine, which has a much broader spectrum and one that changes with the season and with the time of day.

Figure 1: A custom spectrum developed by Heliospectra with special emphasis on blues



The colour spectrum signals to the plants when it is time to accelerate or suppress certain developments. For instance, more blue tones will promote pigmentation and produce thicker leaves. More red tones will stimulate flowering and thereby the density of flowers or fruit. Other light recipes may be used to control a plant's tallness or chemical composition or a range of other features.

Heliospectra has a rich library of light recipes

Heliospectra has unique competencies in identifying and producing the best light spectrum for individual plant species and knowing what time to apply them. Some crops will grow optimally as long as they get a steady diet of their "favourite" light spectrum every day. That optimal spectrum does not change over the life of the plant. Other crops will benefit from having a certain light spectrum in one stage of their life cycle and another in later stages. This will allow the grower to stimulate different features in different stages for an optimal end result. With a fully controlled light programme, a grower can schedule almost to the day when the crops should reach harvestable maturity.

Setting up a facility where plants get different spectra at different ages could be done by arranging a greenhouse into areas lit by lamps set to different wavelengths and then moving the plants between different areas as they mature. This would avoid the need for spectrum adjustment in the individual lamps. Labour cost is however a big part of greenhouse farming and a more flexible, less labour-intensive solution is to install lights with adjustable spectra. Especially in research applications, the opportunity to vary the light spectra is essential.

HelioCORE enables continuous spectrum optimisation

Heliospectra offers lamps with fixed as well as variable spectra. In addition, it has developed a control system, HelioCORE, that can be used to manage the timing, intensity and spectra of all the connected lamps. With fully automated control of all lamps, spectrum adjustment need not be limited to one or two changes in the life of the plant. HelioCORE allows for more or less continuous spectrum optimisation as it can accommodate as much as 150 individual adjustments during the course of 24 hours.

Products and services

The lamps currently on offer are divided into four series with different specifications and application areas. The first three, EOS, ELIXIA and DYNA, are toplights which can be fitted in ordinary greenhouses where they operate in combination with natural daylight or they can be used indoors. Their casings look almost identical (Figure 2) and are equipped with active cooling via a fan. Within each product series a customer can choose between a set of specifications.

Figure 2: Heliospectra toplight



Lamps

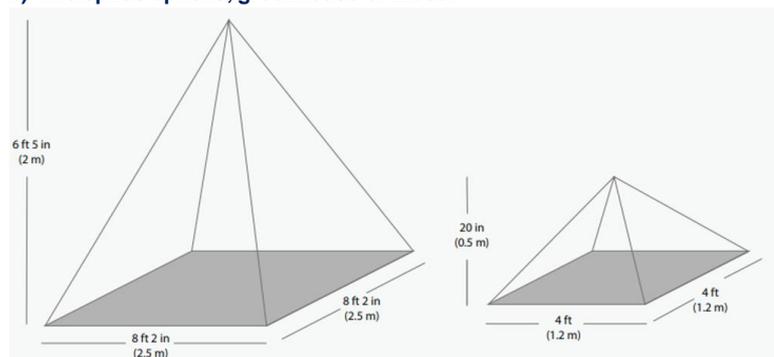
EOS comes in 525W and 630W varieties and has a fixed spectrum. The customer chooses between two available LED plates, the G or C plate (Figure 3a), which determines what spectrum the lamp will use. There is also a choice of two different optics (Figure 3b) which adapts the lamp for either greenhouse or indoor growing. With greenhouse optics, the lamp is normally mounted 2m above the grow bed and lights an area of 2.5m x 2.5m. With indoor optics the height would be 0.5m and the area 1.2m x 1.2m. The lamp has been developed with commercial growers of green or flowering plants in mind.

Figure 3

a) Two plate options, G or C



b) Two optics options, greenhouse or indoor



ELIXIA also has the power varieties 525W or 630W and features the same options as EOS. In addition, it comes with a fully adjustable light spectrum. ELIXIA is compatible with the HelioCORE control system which can be used to vary both the intensity and wavelength mix of the light. It connects with the control system by either Ethernet or Wi-Fi. The lamp is appropriate for growers of vegetables and flowers as well as medicinal plants.

DYNA is a 400W lamp that differs from EOS and ELIXIA in having LED diodes providing nine individually controlled wavelength channels for maximum flexibility. DYNA connects with HelioCORE which means an operator can use the centralised controller to adjust any of the nine channels in any of the lamps in an intensity range from 1 to 100 percent. The wavelength spectrum ranges from 380nm (UVA) to 735nm (Far Red). The product is primarily intended for the AgTech research market.

Figure 4: SIERA is made for vertical farming



SIERA has a different form factor from the other products (Figure 4). It has been developed especially for vertical farming. Vertical farming is an installation where several grow beds are arranged shelf-like on top of each other. The arrangement requires a different light source for each level, and for efficient use of the space a light source has to be compact. The SIERA is therefore shaped as a light bar to fit in the narrow space between shelves. SIERA is dimmable between 0 and 46W and comes in five different fixed spectrum varieties.

Table 2: Summary of product lines

Product	ELIXIA	EOS	DYNA	SIERA
Type	Toplight high voltage/Top Light	Toplight high voltage/Top Light	Research lamp	Light bar
Power	525 W / 630 W	525 W / 630 W	420 W	48 W / 42 W
Spectrum	C spectrum 450nm, 660nm, 735nm, 5700K	G spectrum 450nm, 660nm, 5700K	Research spectrum 	Red light-tallness/Shelf life Blue light-compactness/vitamin content
Optic	Heliospectra Toplights come with a choice of two types of optics: 01 – indoor farming 02 – greenhouse farming		Base reflector and highly transparent acrylic glass	Sowing Indoor farming Graft/healing
Adjustable spectrum	✓	–	✓	Dimmable
Usage	Indoor Greenhouse	Industrial	Research	Indoor
Compatible with helioCORE	✓	–	✓	Update in development

HelioCORE

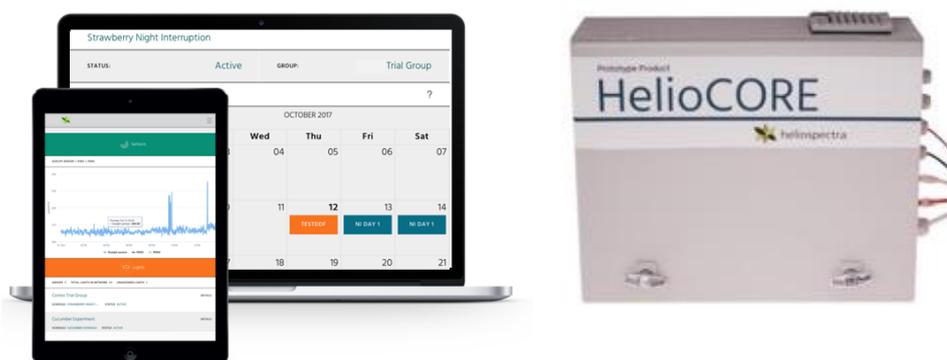
The control system HelioCORE adds detailed control and intelligent feedback to a light installation. In terms of hardware, the system contains a control unit, i.e. the CPU that runs the control software, plus sensors that sit in the grow beds or plant canopies to measure the quality and quantity of light that hits the plants. The user interface software can be accessed from any computer or mobile device.

A choice of three software modules

The HelioCORE software contains three central modules. The modules work independently, and the customer may choose one, two or all three modules depending on their needs:

- A **Daily Light Integral (DLI) Controller**, which regulates the amount of artificial light used as supplement to natural light, thereby securing that crops get their optimal number of photosynthetically active photons per 24-hour period.
- An **On Target Controller**, which secures consistent levels of Photosynthetic Photon Flux Density (PPFD) levels all year round, to maximize plant efficiency and photosynthesis.
- A **Schedule Controller**, by which individual lamps or groups of lamps can be programmed to execute different lighting strategies at different stages of the plant life cycle.

Figure 5: HelioCORE includes a CPU unit and control software



The system is designed to collect feedback from many different sensors at once, which enables different lighting strategies in different parts of the greenhouse. The system can therefore facilitate greenhouses where several different crops are grown in parallel, or crops in different stages of their life cycle. The applied strategies are logged for later replication or compared with other strategies for fine-tuning.

Automated light control means perfectly timed harvest

HelioCORE features fully automated responses to feedback from the sensors. It practically emulates whichever season is best suited for the present stage of each crop by adapting the light automatically. Even if the ambient natural light is late autumn, the system will automatically fill in the gaps so that the blended natural and artificial light will look like high summer to the tomatoes. The system will similarly even out any impact from changing weather conditions. With full control of light conditions, production results can be forecasted with accuracy.

Finally, HelioCORE can be set to take advantage of varying electricity prices at different times of day. By feeding the local price schedule into the system, the control unit may automatically choose the cheapest hours to run the artificial lighting and thereby save money.

HelioCARE

Heliospectra has recently launched a service portfolio called HelioCARE. It spans a handful of applications where Heliospectra's Technical Services specialists work together with the customer before, during and after lighting installation in order to secure successful implementation. The services are grouped into the following areas:

- **Light Analysis & Customized Light Strategies** involves site visits to the customer's greenhouse, analysis of the current light conditions and development of crop-specific recommendations according to the customer's production goals.
- **Installation Design and Support** means planning light design and power supply in parallel, securing the best possible implementation and safe functioning after installation.
- **Plant and Light Training Sessions** consist of in-person training sessions and workshops, covering plant health, production planning and forecasts. Courses are customised to the individual customers and their crops.
- **Crop and Light Consultancy** is a service by which Heliospectra's experts contribute crop-specific advice on lighting strategies, leveraging its more than decade-long experience in light recipes.
- **Crop Trials and Pilot Projects** provide customers with expertise in assessing planned light strategies and their appropriateness for the desired production outcomes. Heliospectra may also help customers off the ground by offering customised R&D or pilot studies at its PlantLab in Sweden.

Figure 6: The HelioCARE service portfolio



Development

MITRA to be launched commercially in late 2019

Heliospectra displayed its forthcoming lamp series **MITRA** during GreenTech, an industry trade show in Amsterdam this June. MITRA has a different form factor from the company's other lamps and is developed to be modular, organized in either a square or a linear layout. It can be adapted to many applications including greenhouse, indoor and vertical farming. The lamp is dimmable 0 – 650W with a fixed spectrum and uses no fan for cooling. It is expected to start shipping in late 2019.

Figure 7: MITRA to be released in late 2019



In future, big data will accelerate product development

Further out, Heliospectra expects to improve automatization further with the introduction of a new set of sensors that directly monitors plant development. With HelioCORE at its centre, the continuous collection of plant diagnostics in combination with data on light, temperature, nutrition etc. will rapidly grow into a rich resource of big data from which to accelerate learning on crop optimisation. The data set can further be used to train machine learning algorithms which may eventually run HelioCORE autonomously.

Revenues come from lamps, HelioCORE and HelioCARE**Business model**

Heliospectra's income relies on three different revenue streams. First are the proceeds from selling physical lamps, which until now has represented most of its revenues. Second are the revenues from HelioCORE, which can be a combination of upfront payment and a subscription fee covering computing hardware, sensors and software. Third are the consultancy fees from the HelioCARE services, which are charged on an hourly basis. Usually, pre-installation services are seen as part of the sales efforts and offered at no charge whereas subsequent services are billed. Still, HelioCARE is seen as a profit centre and its invoicing is intended to more than cover all costs in its business area.

Heliospectra's go-to-market model is predominately based on direct sales by Heliospectra sales people. In total seven employees work in sales and marketing roles, of which four are based in North America. In addition, it relies on a handful of resellers and distributors. In the company's opinion, a successful installation requires the guidance of a highly trained sales force and securing high quality service is difficult via a wide network of resellers.

Promising partnership with ABB

In May 2018, Heliospectra entered a partnership with industrial giant ABB to look for common projects in the Middle East and Africa. Heliospectra's expertise in horticultural lighting and ABB's expertise in electrification and automation form a basis for delivering complete greenhouse solutions, with the aim of boosting productivity and sustainability of agriculture in the region. By joining forces with ABB, Heliospectra gets market access and exposure through ABB's considerable sales force.

One of Heliospectra's priorities during 2019 is to build reference projects together with customers in the food growing industry. When the company raised new equity at the beginning of this year, around 20 percent of the proceeds were intended towards this purpose. The reference projects are meant to showcase what possibilities the technology can offer and inspire a wider group of customers.

Fully outsourced manufacturing

Heliospectra does not manufacture any products itself but relies on outsourced production. During 2018, Heliospectra signed up with a new manufacturing partner in Sweden, who is said to offer high quality and fast scalability of output. Vital components such as LED diodes and power supplies are sourced from reputable, high quality manufacturers. The lamp design is flexible with respect to which brand of LED to use, meaning that components from vendors such as Cree, Osram or Philips can be used almost interchangeably.

Company and key personnel

Heliospectra had 33 employees at the end of 2018, of which seven are stationed in North America and the remainder at the company's head office in Gothenburg, Sweden. The company's top management consists of five people. In addition, seven people work in marketing and sales, eleven in research and development, five in technical services and five in finance and administration. Below is a presentation of the key persons in charge of the company.

CEO Ali Ahmadian took over the helm of Heliospectra in 2017. Before joining the company, Ahmadian spent seven years with TetraPak. At the packaging company, he was most recently Vice President for Asia and Oceania and a member of the Global Executive Leadership Team. He has lived and worked in five different countries on three continents and has extensive experience in managing multi-national teams.

CFO Hans Naess joined Heliospectra in 2019, first as a consultant interim CFO and later as a fulltime employee. His career spans three decades in senior finance and management roles. He was most recently Finance Director at Volvo Bus Corporation for two years and before that he spent four years as CFO of shipping company CMA CGM.

Hanna Rüdél, Vice President of Technical Services, has been with Heliospectra since 2018. She came to the company with 18 years of experience in B2B development within the international food industry. Before Heliospectra, she spent 15 years in executive leadership positions with Micvac AB.

Peter Emanuelsson, Vice President Supply Chain, came to Heliospectra in 2016 with more than 20 years' experience in international trade, production management and B2B sales. He has worked for a wide variety of multinational companies including Stena Recycling AB and Ericsson, where he spent 14 years in senior roles.

CTO Peter Nyberg joined Heliospectra in 2017 and brought with him more than 15 years of experience in system and software development. Before joining Heliospectra he worked at Ericsson, Telia, Volvo Cars and the Adecco Group among others.

Owners and financing

Heliospectra's development has been supported by two long-standing main owners who have contributed growth capital on several occasions. The biggest owner is the Weland Group, which in the ownership list figures as Weland Stål AB and Weland Värdepapper AB but in practice acts as one owner with a combined 39.0 percent of the capital and votes. Weland is a large family-owned industrial group active in construction equipment, forestry and real estate among other sectors. The second biggest owner is Midroc New Technology, the venture capital operation of Midroc, a Swedish real estate and industrial group. Apart from its 11.5 percent stake in Heliospectra, Midroc New Technology has invested in several young technology companies in Sweden. Number three on the ownership list is a relative newcomer. ADMA Förvaltnings AB is an investment company owned by Greg Dingizian, a well-known entrepreneur based in Malmö, Sweden. His company bought its first stake in Heliospectra in 2018 and currently holds 9.4 percent of the shares.

History

- 2006:** Heliospectra AB is founded in Borås, Sweden
- 2007:** The first adjustable lamp is tested with customers
The first patent application is submitted
- 2008:** The Weland group makes its first investment in the company
- 2010:** A network connected lamp is tested in customer setting for the first time
- 2011:** The business moves to new offices in Gothenburg
Industrifonden and Midroc New Technology make their first investments in the company
- 2012:** The first commercial lamp, Helio L4A, is marketed towards R&D organisations
- 2013:** A subsidiary is founded in the US
- 2014:** The LX60 lamp series is launched
IPO on Nasdaq First North together with a SEK 41 million new issue of shares
The first patent is granted in the US
- 2015:** Breakthrough order totalling SEK 5.7 million from a US medicinal plants grower
The first patent is granted in Canada
Commercial release of the E60 lamp series and the company's first lightbar
- 2016:** A Fortune 500 global AgTech company standardises laboratory with Heliospectra technology
SEK 107 million in new equity raised through rights issue
- 2017:** Ali Ahmadian is named new CEO
- 2018:** Commercial release of HelioCORE
The lightbar SIERA for vertical farming is released
Partnership entered with ABB with focus on the Middle East and Africa
- 2019:** Heliospectra Technical Services branded and marketed as HelioCARE
Rights issue raises SEK 52.7 million in new equity

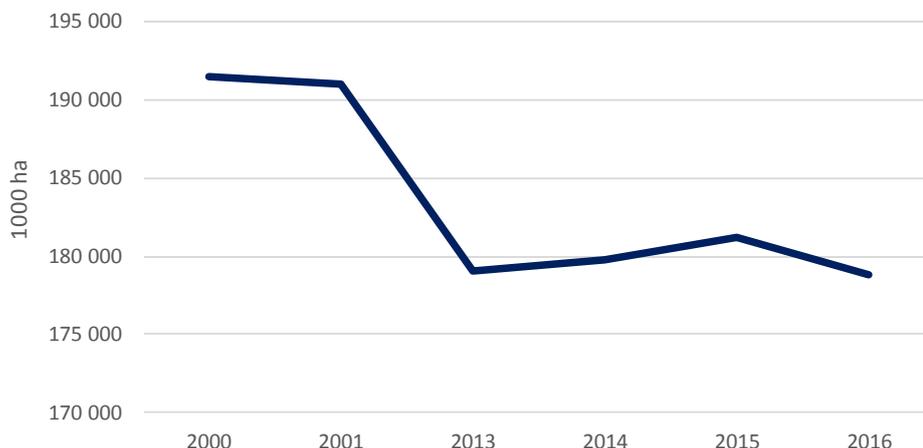
Three main owners control 60 percent of the company

EU agricultural area in marked decline

What is the market potential?

With a steadily growing world population and rising incomes in many countries, the demand for agricultural products is increasing. At the same time, arable land is becoming scarcer as cities and other populated areas occupy ever more of the available land. According to Eurostat, the agricultural area in the EU declined by 6.5% between the years 2000 and 2016, cf. Figure 8. Climate change may put further pressure on agriculture by making weather conditions more unpredictable and some of the land less fertile.

Figure 8: Utilised agricultural area (EU-28)



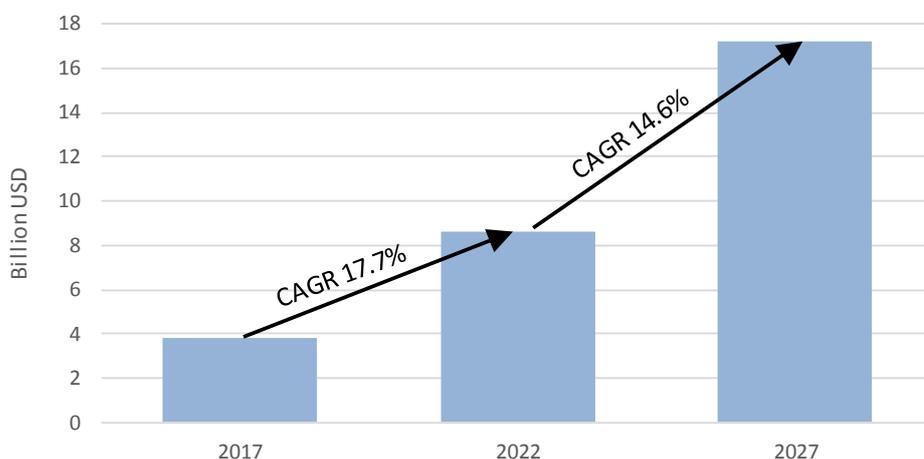
Source: Eurostat

This underscores the need to raise the productivity and predictability of output from existing farming areas. Adding artificial light to a farming site will neutralise some of the weather variability. Bringing more production indoors, where all aspects including temperature, humidity, light and soil can be controlled with precision, not only improves consistency of output but also makes it possible to grow anywhere, even in the middle of large population centres.

Grow lights market forecasted at USD 17 billion in 2027

The market for grow lights is therefore expected to expand fast in the coming decade. A 2017 study by Yole Development estimated the global market for grow lights at USD 3.8 billion. The study pointed to attractive growth opportunities and forecasted the market to grow to USD 8.6 billion by 2022 and to USD 17.2 billion in 2027. These figures include all types of grow lamps on the market, of which HPS lamps currently make up the largest proportion. It is fair to assume that LED lights will grow faster than the overall market as more inefficient technologies are gradually phased out.

Figure 9: The global market for grow lights



Source: Yole Development

Heliospectra's market activities are oriented at three main customer segments; food growers, medicinal plants and research organisations.

Food growers

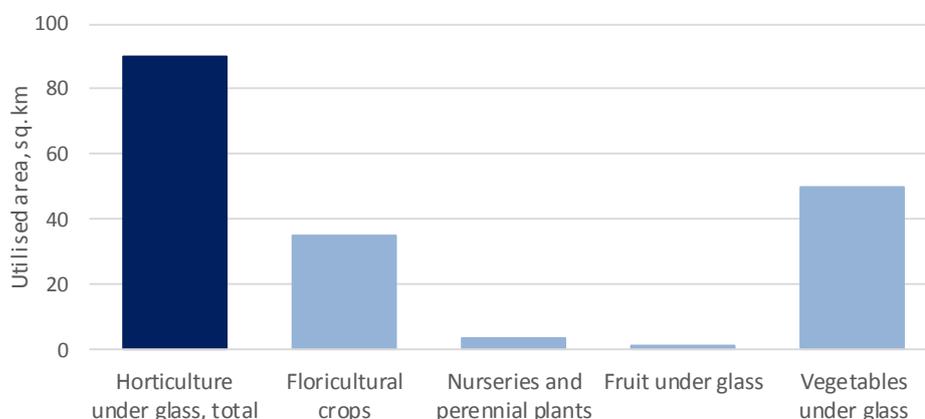
Crops commonly grown in greenhouses include vegetables, leafy greens, microgreens, herbs and flowers. The stable greenhouse climate is conducive to growth and consistent output and makes it possible to grow crops that are atypical for the climate zone.

The world population is well under way to reach an estimated 10 billion people by 2050. According to FAO, the UN agency, the world food supply must increase by 70 percent to meet this challenge. Raising agricultural efficiency is therefore crucial and greenhouses can play a big part in the required transition. Some estimates put the global greenhouse area dedicated to food production at more than 6 400 sq. km, but it needs to grow further to accommodate the increasing demand for food.

The Netherlands shows the benefit of greenhouse farming

The advantage of modern greenhouse production is illustrated by the case of the Netherlands, the greenhouse capital of Europe. According to a 2017 National Geographic article, the Netherlands is the world's second largest food exporter in dollar terms, despite its size and extreme population density. The reason spells huge greenhouses fitted with modern technology. Whereas a country like Sweden only has 2.9 sq. km of greenhouses, the combined greenhouse area in the Netherlands covers 90 sq. km. Dutch growers thereby achieve a yield per area that is far better than other countries. In tomato production for example, Dutch farmers reap nearly ten times as much product per square metre as the average among the world's 25 biggest tomato producers. Their water footprint is also significantly lower.

Figure 10: Greenhouse farming in the Netherlands, 2018



Source: Statistics Netherlands (CBS)

Most greenhouses on the Northern Hemisphere use artificial lighting as a supplement to natural daylight. HPS lamps are still the ruling standard. However, as electricity is one of the biggest costs of greenhouse farming, there are strong incentives to convert to more energy-efficient solutions, such as LED. The perceived complexity of LED installations and conservatism within the industry are, according to Heliospectra, factors that have held back the speed of conversion so far. By building reference installations, the company hopes to provide living illustrations of the many benefits of smart LED and dispel anxieties around the new technology.

Indoor farming gives the farmer full control

Apart from traditional greenhouses, there are many initiatives to grow food indoors using only artificial lighting. This will allow growers to produce closer to population centres. It also represents an opportunity to utilise building space that is unattractive e.g. because of lack of daylight. Indoor growing provides unprecedented control of the harvest as the grower determines all factors of production. This also means little or no vulnerability to

pests and diseases, removing the need for pesticides. The usual risks involved in growing organically are therefore no longer a factor.

Vertical farming is efficient use of space

When farming indoors, it is important to make efficient use of space and vertical farming is one way to achieve this. By farming vertically one can grow on an area many times the floor space, by organising the grow beds in layers on top of each other. Each layer needs its own light source however, so the number of lamps required in vertical farming can get substantial. LED lamps are a favoured choice in vertical farming as they give off little heat. This enables the farmer to minimise the vertical distance between grow beds without risk of overheating the plants.

Medicinal plants

Many species of plants can be labelled medicinal, but in the market for grow lights, cannabis is the only game in town. For decades, cannabis has primarily been grown indoors using artificial light for an obvious reason: Most of the production was illicit and had to be kept out of sight.

Global trend towards cannabis legalisation

In recent years, a wave of legalisation has spread around the world. Growers in many countries have been licensed and no longer have to hide. Indoor farming is nevertheless the dominant method. Cannabis is a crop that responds strongly to the intensity of light and artificial lighting is therefore in high demand. Licensed growers are also transforming the trade, streamlining and industrialising production and demanding more advanced and higher-quality equipment.

Legal cannabis could become a USD 32 billion market

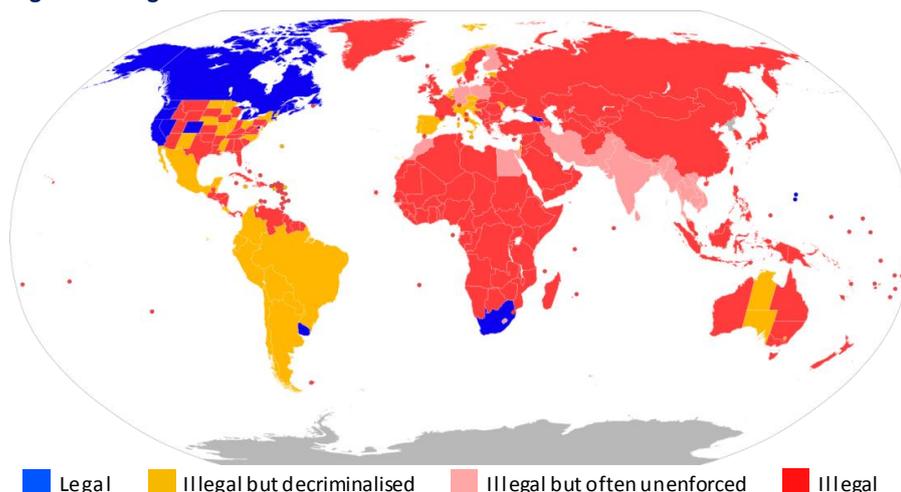
The research firm Arcview Group has estimated the world market for legal cannabis at USD 12.9 billion in 2018 and it expects it to grow on average 27.5 percent per year until 2022 when the industry will be turning over USD 32 billion. North America is the absolute world leader in cannabis consumption. Arcview Group estimates that the US alone made up 90 percent of the world market in 2017, but due to faster growth in other markets, its share is expected to shrink to 73 percent by 2022.

The legal status of cannabis can be split in two: Recreational use, which means that its use is completely unrestricted for adults; and medical use which means cannabis products can be prescribed for patients with a confirmed medical condition. The trend towards legalisation is however noticeable in both areas.

Canada has 179 licensed cannabis producers

Recreational consumption is fully legal in Canada, Uruguay, Georgia, South Africa plus ten states in the United States. In addition, many countries around the world have a legal ban but the use is either decriminalised or the ban is unenforced, cf. Figure 11. Recreational cannabis became legal at the federal level in Canada in October 2018 and since then, a burgeoning industry has emerged. A federal licence is required to cultivate, process and sell cannabis for medical as well as non-medical purposes. At present, there are 179 licence holders in the country, up from 82 in late 2017. In a 2017 report, consultancy firm Deloitte estimated that the Canadian recreational cannabis market could swell to an annual turnover of nearly CAD 23 billion.

Figure 11: Legal status of cannabis for non-medical use



Source: Wikipedia

22 countries allow cannabis for medical use

Medical use of cannabis has been legalised in many more countries. 22 countries around the world plus 33 American states have a general acceptance of cannabis for medical use. Among the 22 we find a concentration of European and Latin American countries. In addition, there are several countries who allow the use of some cannabis-derived drugs.

There has been little clinical research into the medical benefits of cannabis, but evidence suggests that cannabis can reduce nausea and stimulate appetite and weight gain in HIV patients and patients undergoing chemotherapy. It can also relieve pain and reduce muscle spasms e.g. in patients with multiple sclerosis or epilepsy.

The active substances in cannabis is a family of chemical compounds collectively known as cannabinoids. Two of the most prominent are tetrahydrocannabinol (THC) and cannabidiol (CBD). THC is the main psychoactive substance in cannabis and is mainly responsible for inducing intoxication in users. CBD does not cause intoxication on its own but is instead associated with most of the medical benefits of cannabis.

Smart LED will boost pharmaceutically active substances

To distil an efficient pharmaceutical from cannabis with minimal side effects, a manufacturer would probably prefer a raw material that was rich in CBD but with minimal THC. The benefit of spectrum-controlled LED lighting is that it can be used to boost the plant's production of one substance and suppress the other. If cannabis continues to improve its standing as a pharmaceutical product, it is reasonable to assume that growers will adopt smart LED as a means of adapting their product to such demands. Suppressing the intoxicating elements of cannabis could also change its public perception into a pharmaceutical instead of a recreational drug.

AgTech

The need to grow more agricultural products per m² of arable land has triggered intensified interest in research into plants and their cultivation. Research is being conducted at universities and other academic institutions but increasingly also by large industrial players in the fertiliser, seed and crop development industries. Corporate giants such as Monsanto, Syngenta, Bayer, Dupont and BASF have all taken an interest in this space.

There is little data to go by in assessing what the size of this market could be. What we can be sure of, however, is that in volume terms, the AgTech market is much smaller than the Heliospectra's other two target markets. It is still substantial, however. Wikipedia lists more than 160 universities around the world who offer degree programmes in Agricultural Engineering, Biological Engineering or similar. When these are added to the commercial AgTech

AgTech has few but attractive customers

giants mentioned above, plus their undergrowth of small and mid-sized companies and recent startups, the totality makes up an interesting market. A fair guess would put the combined number of research sites using artificial lighting at many hundreds, if not thousands.

Apart from pure numbers, the AgTech market is interesting for Heliospectra as a source of cooperative learning. By working with the vanguard of agricultural research, Heliospectra can share in their knowledge and use it to refine its product offering. It may also benefit the brand that the most demanding customers in the area extends a stamp of approval to Heliospectra by using its products. Finally, Heliospectra is one of a very small group of suppliers able to provide lamps with the versatility to work in advanced research laboratories. This means little competition and should provide opportunity to sell at a strong margin.

How is the competition?

A quick survey reveals that there are dozens of manufacturers of LED grow lights on the market. In their own publicity material, they all boast impressive specifications. However, a deeper investigation reveals that most are not comparable to Heliospectra when it comes to functionality. Many products are limited to shining either of two pre-set spectra, one for growth and one for flowering, thus revealing that they are intended for cannabis only. Only a handful of companies offer products that can be compared with Heliospectra for flexibility, applications and product quality. We list some of the most important competitors below.

Illumitex (Private: US) has been involved in horticulture lighting since 2005. Like Heliospectra, it offers a range of advanced LED grow lights for indoor and greenhouse farming. It has also developed a central control unit for wireless control of groups of lamps. All models presented on its website come with fixed spectra so the central control is presumably for timing and dimming only, not for spectral adjustment. Their lamps use LED components from Cree. Besides lighting, Illumitex is marketing an AI tool named FarmVisionAI, containing cameras, database and analytics application to help farmers apply machine learning to optimise their crops.

Lumigrow (Private: US) was founded in 2008 and is specialised in LED lighting solutions for horticulture. It targets growers of a wide range of crops, including leafy greens, vegetables, cannabis and flowers and is suited for indoor as well as greenhouse growing. It currently offers only one lamp series, TopLight LED, that can be installed in modular setups like Heliospectra's MITRA. It comes with a selection of fixed and variable spectra and the lamp functions can be monitored and controlled via a cloud-based control system reminiscent of HelioCORE.

Hortilux (Private: NL) came into business in 1997 and has a long history of working with supplemental greenhouse lighting. Early on the focus was on HPS lamps but since 2008 the company has offered both HPS and LED. The company emphasises individual advice and tailor-made installations for each customer. It also offers supplemental services such as service and maintenance. The product line includes four different LED series, three of which are dimmable and offer fixed but fully tailor-made light spectra. The lamps can be monitored and controlled using a digital platform, Hortisense, to keep track of the crop's total light exposure and crop strategies.

Fluence Bioengineering (Private: US) was acquired by **Osram Licht AG** (Xetra: OSR) for an undisclosed amount in May 2018. Fluence was founded in 2013 and introduced its first range of LED lamps in 2015. Its product line includes four LED lamp series aimed at greenhouse as well as indoor farming. All of the lamps have a very compact form factor and one has been optimised for vertical farming. Most models are dimmable and have a choice of fixed spectra.

Signify (Euronext Ams: LIGHT) was spun out of **Philips N.V.** (Euronext Ams: PHIA) and listed in 2016. It is focused on providing lighting solutions for a range of different applications,

including office, home and outdoor as well as horticulture. For growers, Signify provide solutions based on Philips LED lights. Philips' product portfolio include lamps for flower crops, fruit and vegetables and cannabis and can facilitate both greenhouse and indoor/vertical farming. In 2018, Signify launched the so-called GrowWise Control System which can be used to program and adapt light spectrum and intensity. The system integrates with climate control and greenhouse management systems for a full overview of all factors of the crop environment.

LED advantages over other lighting technologies

What are Heliospectra's competitive advantages?

Heliospectra's competitive advantage rests on two factors, where the first is the advantage of LED over other lighting technologies and the second is the advantage of Heliospectra over other LED suppliers given its premium light fixtures and intelligent control system. The first advantage is well understood but could be briefly summarized as follows:

- Energy-efficient in terms of photons per watt, meaning lower recurring costs
- Low heat emissions, which also saves costs via reduced ventilation needs
- Customisable light spectrum, enabling the provision of optimal wavelength spectrum irrespective of the quantity and quality of ambient natural light
- Opportunity to add light outside of the visible range, such as UV or far red

For customers only looking to lower recurring costs, Heliospectra is probably not the best choice. There are lots of suppliers able to deliver cheap, standard LED products that represent an improvement over HPS but otherwise have rather basic functionality.

Heliospectra's advantages over other LED suppliers

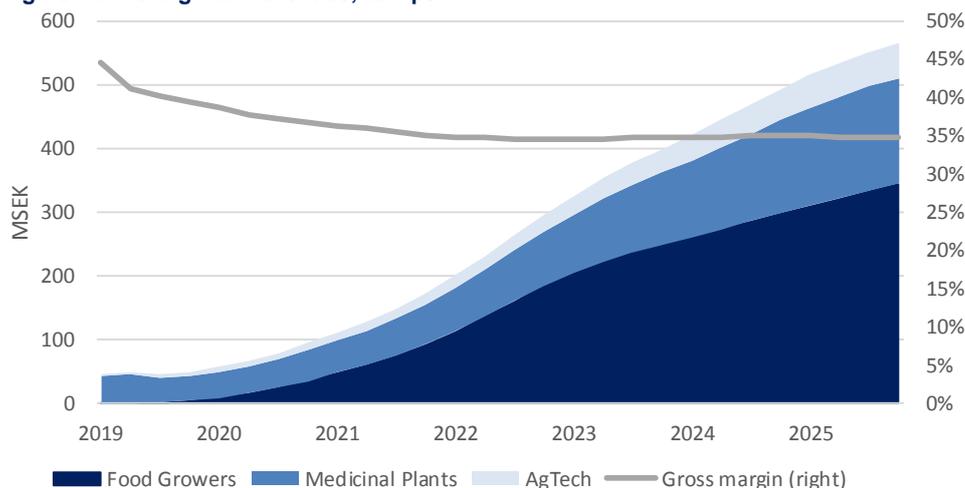
Heliospectra is a premium supplier and its products will appeal to customers aiming to reap the full benefits of what state-of-the-art LED systems have to offer. In our opinion, this is where Heliospectra's technology leadership comes into its own:

- More than a decade's worth of research into the interplay between plants and light recipes, yielding a unique library of optimal lighting strategies across species and growth stages
- The advanced control system HelioCORE, which can control up to 2 000 lamps and be programmed to make as much as 150 daily adjustments to light colour and intensity
- User friendly setup and operation of the control system, which communicates over WiFi with ELIXIA lamps
- Lamps with a variable spectrum, which is very rare among competitors
- Tailor-made spectra for all lamps
- Service offering with HelioCARE, securing the customer a successful installation with optimal spectrum, layout, power supply etc.
- Capability of producing light in the far red spectrum, which can penetrate several layers of leaves and e.g. stimulate photosynthesis in the inner leaves of lettuce
- Probably the market's most versatile product in DYNA, the research-oriented lamp with nine fully adjustable wavelength channels
- Stamp of approval for the brand on the back of deliveries to prestigious customers in research and development. Supporting testimonies from a variety of customers
- The alliance with ABB, which opens large new market opportunities without a need for Heliospectra to deploy its own sales force, besides providing a competent partner for delivering comprehensive, high-quality installations
- High-quality products with very low failure rate

Finally, Heliospectra's business interests are secured by patents. The company has one granted patent family valid until 2028, covering a system for modulating plant growth or attributes. Most relevant geographic markets are covered by these patents. In addition, the company has submitted another seven patent applications relating to future products. The company may submit further patent applications on the back of its ongoing R&D operations.

Other segments to outgrow cannabis	What is the earnings outlook? <p>To help us estimate fair value for the company and its stock, we have developed a set of economic projections for the company's future earnings. Up until now, almost all of the revenues have come from the sale of lamps. Judging by the published order flow, its customers have been highly concentrated to the cannabis market. Going forward, the company expects to intensify efforts to conquer the greenhouse food market and we also expect AgTech to contribute meaningfully. We have estimated revenue streams for each market segment separately. In addition, we have estimated revenue streams from the more recent services segments HeliocORE and HeliocARE.</p>
Food growers are a gigantic opportunity	<p>The market for greenhouse lighting for food growers is gigantic, even though far from all greenhouses have artificial lighting. Starting with the statistic that global greenhouses cover more than 6 000 sq. km, we have assumed that roughly a third need lamps. Out of those 2 000 sq. km we assume around half will eventually be lit by LED lamps. Reckoning about one lamp per handful of square metres, our model assumes an installed base of nearly 170 million lamps. If lamps have a service life of around 10 years, the addressable market would sum up to sales of 17 million lamps per year. Given the slow progression of this market, we have assumed that Heliospectra's sales will grow very gradually and only in the year 2030 will they have captured 0.5 percent of the addressable market. Still, that constitutes annual sales totalling 85 000 lamps and make up Heliospectra's most important revenue stream in our model.</p>
Cannabis market to grow fast in the next five years	<p>Medicinal plant growers are already avid users of LED grow lights and for a good reason: If you have a crop with high commercial value per m², it is easier to justify installing valuable equipment. Many cannabis growers are fairly new and lack a legacy of other technologies, which may be why they go for LED directly. Assessing the size of the market, we build on the data that Canadian demand for legal cannabis is estimated at 610 000 kg this year, and that the world market is said to be around three times the Canadian market. Modern production facilities yield around 1.4 kg/m² and install almost one lamp per m². Putting this together and assuming lamps are renewed every 10 years, we estimate an addressable market worldwide of around 130 000 lamps per year for cannabis growers. The market is still growing rapidly, and we have assumed it to grow 20 percent annually until 2024 before it steadies at a more moderate pace. Heliospectra is already a player in this market and as a quality leader, we expect them to grow to a 5 percent market share in the next five years.</p>
Smaller market but bigger share in AgTech	<p>AgTech is a much smaller market than the previous two. Heliospectra sees a 60/30/10 split between its different addressable markets with greenhouses the biggest and AgTech the smallest component. In volume terms, AgTech is probably an even smaller share. We have for simplicity assumed that the addressable volume equals one fourth of the cannabis market but without the rapid growth in the next five years. Heliospectra is excellently positioned to take advantage of this market, being among the very few who can deliver sufficiently high-spec lamps for research. In consequence, we have assumed the company to take a full 10% share of the addressable market by 2024.</p>
Prices and margins differ by segment	<p>We have assumed different prices and gross margins between markets. Food growers will probably have to be incentivised with low prices, besides demanding products from the basic end of the product line. We have assumed a selling price of on average SEK 7 000 per lamp and 30 percent gross margin. For medicinal plants, we have assumed SEK 10 000 per lamp and 40 percent margin. Among AgTech customers, we assume that only top of the line products will do. Because of low competition, margins should be high. We see the average price in this segment at SEK 15 000 and gross margin at 50 percent.</p>

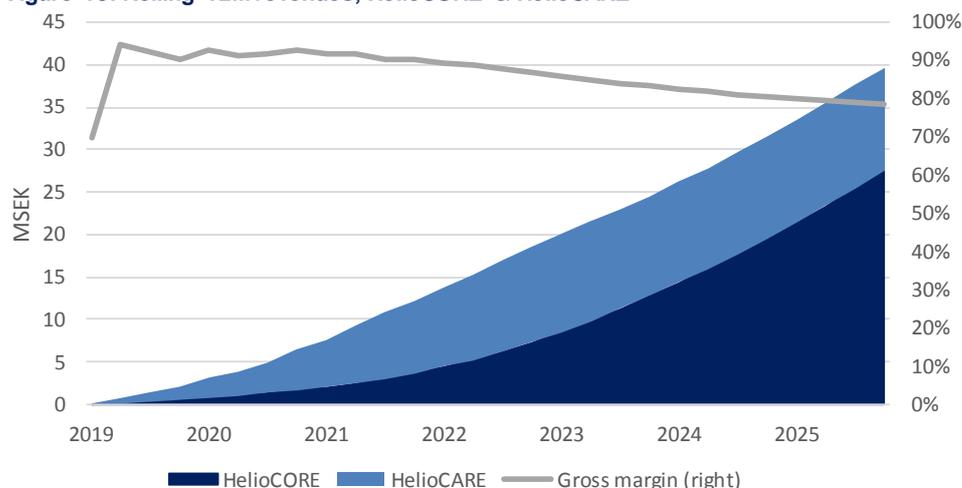
Figure 12: Rolling 12M revenues, Lamps



Source: Västra Hamnen Corporate Finance

We expect the services HelioCORE and HelioCARE to be important for the sale of other equipment but make up more modest revenue streams in themselves. Being mostly services, they imply very high gross margins. We expect HelioCORE to be the more important of the two. Revenues will scale up in step with the accumulated deliveries of control units, as each delivery will be followed by recurring licence fees.

Figure 13: Rolling 12M revenues, HelioCORE & HelioCARE



Source: Västra Hamnen Corporate Finance

We see breakeven in 2021

The company has a cost base of SEK 55-60 million per year at present, meaning the threshold for breaking even at EBITDA level is a revenue around SEK 125-150 million with gross margins around the recent 40 percent average. In our model the company passes this hurdle in 2021. We see growing net profits from 2022 onward. Due to the nearly SEK 230 million of accumulated net losses, we expect carry-forwards to reduce taxes to the extent that the first year in which the company pays net taxes will be 2025.

Table 3: Summary income statement

MSEK	2018	2019e	2020e	2021e	2022e	2023e	2024e
Net revenues	45,4	50,6	101,4	185,7	315,2	424,8	525,4
Total revenues	46,0	50,6	101,4	185,7	315,2	424,8	525,4
COGS	(30,1)	(28,8)	(59,9)	(112,7)	(195,9)	(265,1)	(327,0)
Operating expenses	(46,5)	(56,5)	(61,8)	(69,0)	(77,6)	(86,1)	(92,8)
EBITDA	(30,5)	(34,7)	(20,3)	4,0	41,6	73,5	105,6
Amortisation & Depreciation	(2,7)	(3,5)	(3,8)	(4,2)	(4,6)	(5,0)	(5,2)
EBIT	(33,3)	(38,2)	(24,1)	(0,2)	37,0	68,6	100,4
Net financials	(0,1)	(0,1)	(0,1)	(0,1)	(0,1)	(0,1)	(0,1)
EBT	(33,3)	(38,3)	(24,2)	(0,3)	36,9	68,5	100,3
Taxes	-	-	-	-	-	-	-
Net profit	(33,3)	(38,3)	(24,2)	(0,3)	36,9	68,5	100,3

Source: Västra Hamnen Corporate Finance

New share issue in April brought SEK 49 million

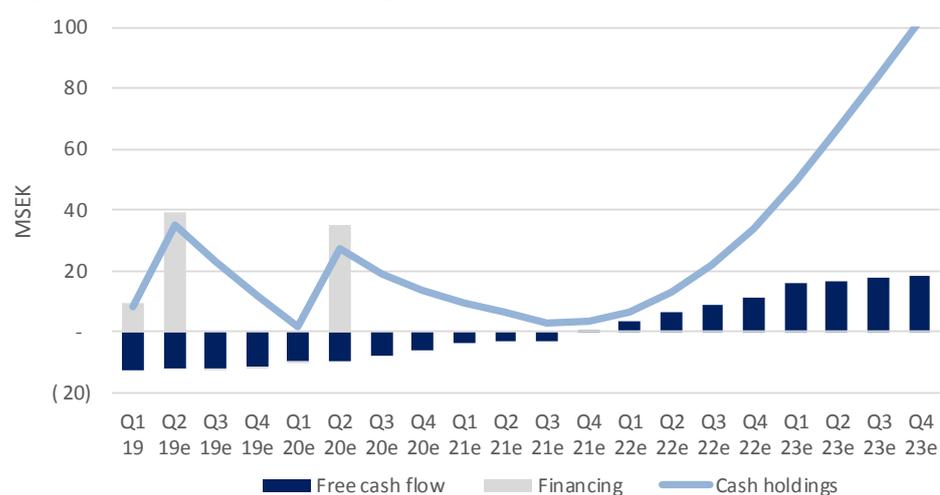
How is the cash situation?

Heliospectra reported net cash holdings of only SEK 8.0 million at the end of Q1 this year. Since then it has replenished the liquidity reserve with a new share issue with preferential rights for existing shareholders. The issue was completed in April and fetched around SEK 49 million after issue costs.

Another equity issue Q2 2020?

That may not carry them all the way to self-sustaining financing, however. At present, the company runs negative cash flows from operations at about SEK 8 million per quarter. Capex needs are fairly modest but with the expansion we see a low but steady outflow of cash for building working capital. All told, we expect the current cash balances to run out around mid-year 2020 and we have pencilled in another new issue of shares in the order of magnitude SEK 35 million to occur in Q2 2020.

Beyond 2021 we see cash flows picking up in earnest. That will eventually lead to substantial surplus cash which may be put towards dividends, acquisitions or other new investments.

Figure 9: Cash flow and cash holdings

Source: Västra Hamnen Corporate Finance

What is fair value for the stock?

We apply two techniques to estimate fair value for the company. The first is a discounted cash flow (DCF) model based on the economic scenario described above and the second is a peer valuation. We perform the DCF valuation using two steps (see details in the appendix). In the first we estimate fair enterprise value assuming that the company survives until it reaches sustainable profitability. In the second we multiply this enterprise value with a risk coefficient, reflecting the probability of it reaching the profitable stage.

We apply a WACC of 16 percent

As the risk coefficient adjusts for the risk of non-survival, we can apply a lower discount rate than would otherwise be the case. We have chosen to discount future cash flows by a weighted average cost of capital (WACC) rate of 16 percent. One could argue for a lower WACC given that the company has an almost complete product range and has proved that it can sell at attractive gross margins. On the other hand, even after it has reached profitability, Heliospectra will be a small company operating in the volatile tech industry with potentially strong competitors. By using a high WACC now, we leave room for future valuation upgrades when and if Heliospectra's competitive position has been fortified.

The net present value of cash flows during the model's explicit period until 2030 sum up to SEK 272.7 million. To this we add a discounted terminal value of all cash flows from 2031 onward, assuming a growth rate of 2.5 percent in perpetuity. Together this implies a fair enterprise value of SEK 532.8 million before adjusting for survival risk.

Many young companies struggle to make it from the start-up and growth stages and into a stage of stable profitability. Many fail along the way. That is why we multiply the enterprise value by a coefficient that represents the chance of this particular company making it to the profitable stage. Over time we may revise this coefficient, and the closer the company comes to delivering sustainable profits, the higher the coefficient.

Considering Heliospectra's present stage and our assessment of the risk, we regard 50 to 80 percent to be a reasonable probability range. We use these figures as multiples to risk adjust our estimated enterprise value. Our estimate of fair enterprise value is SEK 266.4 million using 50 percent risk weight and SEK 426.3 million using 80 percent weight.

Table 4: DCF model assumptions

MSEK	2019e	2020e	2021e	2022e	2023e	2024e	2025e	2026e
Total revenues	50,6	101,4	185,7	315,2	424,8	525,4	606,2	672,4
EBIT	(38,2)	(24,1)	(0,2)	37,0	68,6	100,4	125,7	146,0
EBIT margin	-75,4%	-23,8%	-0,1%	11,7%	16,1%	19,1%	20,7%	21,7%
Adj. Taxes	-	-	-	-	-	-	(9,1)	(32,1)
NOPLAT (= EBIT - tax)	(38,2)	(24,1)	(0,2)	37,0	68,6	100,4	116,6	113,9
Depreciation	3,5	3,8	4,2	4,6	5,0	5,2	5,4	5,6
Capex + Working cap	(12,9)	(12,5)	(14,2)	(11,1)	(4,3)	(10,6)	(4,0)	(8,3)
Net cash flow	(47,6)	(32,8)	(10,2)	30,5	69,2	95,1	118,0	111,2

DCF (MSEK)

WACC	16,0%	16,0%
Enterprise value (EV)	532,8	532,8
Prob of profitability	50%	80%
Risk adjusted EV	266,4	426,3
Warrants	-1,6	-1,6
Net cash (= cash - debt)	25,7	25,7
Fair value market cap	290,5	450,4
Diluted no of shares (M)	46,82	46,82
Fair value/share (SEK)	6,20	9,60

Sensitivity analysis (value per share, SEK)

		Prob of profitability			
		50%	60%	70%	80%
WACC	20%	4,20	4,90	5,60	6,30
	18%	5,00	5,90	6,80	7,70
	16%	6,20	7,30	8,50	9,60
	14%	7,90	9,30	10,80	12,30
	12%	10,30	12,20	14,20	16,10

Source: Västra Hamnen Corporate Finance

DCF model yields fair value of SEK 6.20 – 9.60 per share

To go from fair enterprise value to fair market capitalisation we add the company's cash holdings and subtract all interest-bearing debt. We also subtract the market value of outstanding warrant programmes as they represent a liability for the company. This leaves us with a fair market valuation of the equity at SEK 290.5 million using 50 percent risk weight and SEK 450.4 million using a weight of 80 percent. **This is equivalent to a fair value per share of 6.20 and 9.60 SEK, respectively.**

We have also performed a so-called peer valuation, meaning a valuation based on what values the market assigns to comparable companies. The difficulty in comparing young companies against one another is that they lack profits, and sometimes even revenues, to use as parameters for comparison. In the case of Heliospectra, it is also difficult to find listed companies with comparable business interests, unless you count the global industry giants Philips and Osram.

Instead, we have chosen to compare its valuation against Swedish Nasdaq-listed companies in the same industry subsector, Electrical Equipment and Power Systems, see Table 5 below. Only three companies in this subsector have advanced from growth stage to a stage of sustainable profits. The comparison with Heliospectra is far from perfect but it serves as a helpful reality check on our DCF valuation when we compare the peers with a discounted future version of Heliospectra. We have chosen to zoom in on the year 2024, when Heliospectra according to our model enters a decidedly slower growth stage while delivering a profit of SEK 100.3 million on a revenue of SEK 525.4 million.

Peer valuation suggests SEK 8.90 – 19.70 SEK per share

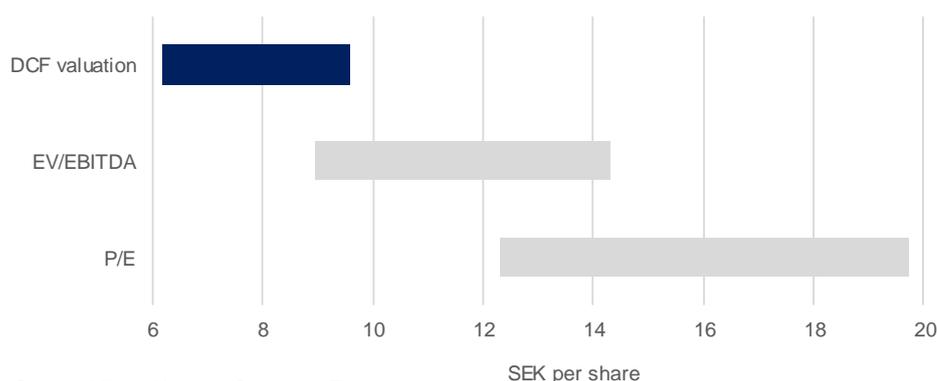
We have taken the average profit multiples of the peer group and applied them to Heliospectra's estimated profits in 2024, discounted the resulting company valuation to the present, and finally applied the two risk coefficients 50 and 80 percent as in the DCF model. **In summary, the peer analysis suggests a fair value of between SEK 12.30 and 19.70 per share using P/E and between SEK 8.90 and 14.30 based on EV/EBITDA.**

Table 5: Peer analysis

MSEK	Market cap	Net profit T12M	P/E	Enterprise value (EV)	EBITDA	Sales	EV/EBITDA	EV/sales
Heliospectra	302,0	(36,0)	neg	300,6	(32,9)	45,7	neg	6,6
Fagerhult	10 986,0	497,9	16,5x	17 313,4	1 028,0	5 944,6	16,8x	2,9
PowerCell Sweden	4 279,2	(62,0)	neg	4 229,8	(74,6)	61,9	neg	68,3
AQ Group	3 395,4	169,6	20,0x	3 884,5	379,5	4 830,0	10,2x	0,8
GARO	3 265,0	88,4	36,9x	3 309,6	150,1	943,7	22,0x	3,5
Minesto	2 214,7	(11,0)	neg	2 212,3	(16,2)	-	neg	--
SaltX Technology Holding B	324,9	(126,8)	neg	314,1	(62,9)	6,4	neg	48,8
Average			24,5				16,4	
Heliospectra 2024e		100,3			105,6	525,4		
Fair value per share, SEK			12,30 - 19,70				8,90 - 14,30	

Source: Factset, Västra Hamnen Corporate Finance

Figure 10: Football field - DCF, EV/EBITDA, P/E



Source: Västra Hamnen Corporate Finance

What is behind the numbers?

In our research we try to look beyond the reported numbers to see if the company uses accounting methods, or reports items off the income statement or balance sheet, that could impact our interpretation of its official figures. The underlying economics of the company could be stronger or weaker than they look at first glance and this could be important for our valuation.

Modest use of capitalised costs

In the case of Heliospectra the picture is rather straightforward. We are always wary of excessive capitalisation of development costs but Heliospectra uses this opportunity rather sparingly. At the end of Q1 this year, the combined immaterial assets (including patents) was valued at SEK 15.1 million. The capitalised amount will lower future accounting profits as the assets are depreciated but the scale here is little to worry about.

Latent tax asset off the balance sheet

On the other hand, there is an off-balance sheet asset in the form of accumulated losses which could be brought forward to reduce taxes in coming years. This latent tax asset has not been listed in the balance sheet, probably because of its uncertain nature. At the end of 2018, the accumulated losses amounted to SEK 228 million. This amount times the future corporate tax rate will reduce coming tax costs if and when the company turns a profit.

Warrant programmes could dilute equity by 2.2 percent

A final thing to note is that the company has two outstanding warrant programmes. One of them was extended to Viridian Capital & Research in New York in 2015 as compensation for services to Heliospectra. The warrants give Viridian the right to subscribe for 137 912 shares at a price of SEK 17.88 per share until 27 February 2020. The second warrant programme was offered to employees of Heliospectra in April this year. 25 employees bought a total of 905 000 warrants, each with the right to subscribe for one share of Heliospectra at a price of SEK 6.13 until 30 April 2021. Since both warrant programmes are out of the money, we have not included the potential new shares when calculating the per-share values in our valuation above. Instead, we have counted the market value of the warrant programmes as a liability that subtracts from our fair value estimate. If both warrant programmes were to be exercised in full, the dilution of existing equity would be 2.2 percent.

What could go wrong?

Competition the biggest risk

Arguably the biggest threat to Heliospectra's success is that of competition. With industrial giants such as Philips and Osram on the playing field, Heliospectra has competitors able to outspend them in sales and marketing if they should decide to pursue the market aggressively. The heightened attention on this market following the wave of cannabis legalisation could attract even more industrial majors. Even though we regard Heliospectra as one of the highest quality suppliers on the market, their marketing could in the worst case be drowned out by bigger and stronger rivals.

Current customers are not the strongest credit

Another risk is related to the financial strength of their customers. So far, the customer group has consisted largely of cannabis growers, many of which are rather new enterprises. With short credit histories, their access to funding can be challenging. This could mean that the market for grow lights might expand more slowly than we have anticipated. We note, however, that the dubious credit strength of some of its customers is not a direct credit risk to Heliospectra, as the company usually demands upfront payment for its product sales.

A risk to our valuation conclusions is that the famous conservatism among food growers could make their adoption of smart LED technologies progress more slowly than assumed in our model. Our fair value estimate is based on the assumption that food growers eventually become a bigger customer to Heliospectra than cannabis growers. If this fails to happen, or happens much more slowly, our value estimation will have to be revised down.

A risk to be too closely associated with cannabis

For Heliospectra's stock, there are uncertainties relating to its close association with the cannabis business. The company naturally focuses on responsible, licensed growers of cannabis. In addition, it seems reasonable to assume that the public perception of cannabis will gradually evolve from recreational drug to important pharmaceutical. But if not, Heliospectra's stock could find itself on the wrong side of many investors' CSR screens and therefore trade at a lower valuation.

Finally, we have identified a potential need for further equity financing in about a year's time. We note that the rights issue this spring was only partly successful with underwriters having to take a 24 percent share of the issue in order to fill the book. Main owners controlling half of the shares have stood firmly behind the company for years and will most likely continue to support it. But from the viewpoint of a minority investor, the funding opportunities would look decidedly more uncertain should any of the main owners decide to turn off the tap.

Keep an eye on the order flow**Coming events**

Heliospectra has provided a steady news flow of press releases announcing new orders. This is likely to continue. Of particular interest would be potential news of orders from food growers. As we have indicated above, this is where we see the biggest opportunities in the long run and where a breakthrough order would be most welcome.

The company showcased the MITRA, its new lamp model at trade shows in June and we would not rule out pre-orders for this model in the coming months. The full commercial release is however planned for late autumn, so that is when we get the first true impression of its market appeal.

A more formal agreement with ABB?

The cooperation with ABB has so far been performed under a joint memorandum of understanding rather than a formalised agreement. Our impression is that both parties benefit from the relationship and would not be surprised to see the announcement of a more formal agreement in the coming months.

Another potential development could be the launch of a new service which could be labelled Light as a Service. Most of Heliospectra's customers do not have the experience nor the interest to get involved with light fixtures, they just want the illumination of their crop. Therefore, they would presumably appreciate not having to buy the equipment but subscribe to a service whereby the equipment was installed and operated by a third party. We suspect Heliospectra to be considering such a service and think it could help boost sales.

Financial calendar

23 Aug 2019	Q2 report 2019
25 Oct 2019	Q3 report 2019

Appendix: Valuation method

Companies in an early stage usually report negative net profits and may have many years left until they turn a profit. Sometimes they even have years until their first significant sales revenues. The difficulty in valuing growth companies with limited historical records is that the valuation rests on uncertain estimates of future earnings; more uncertain than for companies with years of stable profits on record. There is little in terms of historical figures on which to base estimates of future revenues, future profit margins and other items.

To handle these challenges, we choose to follow a generally accepted method for valuing growth companies described by finance professor Aswath Damodaran¹⁾ among others. Instead of scaling the discount rate (WACC) to account for all the risks and uncertainties associated with a young company, we use a two-stage valuation approach:

- First, we estimate fair enterprise value under the explicit assumption that the company survives until its first year of sustainable profits. We use a WACC commensurate with the circumstances of the company once it reaches profitability.
- Second, we adjust the estimated enterprise value by multiplying with a probability factor reflecting the likelihood that the company survives.

With each passing period after the initial valuation, the probability factor may be adjusted based on the company's development and our updated assessment of its chances of survival.

1) **Damodaran, Aswath**, "Valuing Young, Start-up and Growth Companies: Estimation Issues and Valuation Challenges", Stern School of Business, New York University, May 2009

Income Statement - Annual Data

kSEK	2017	2018	2019e	2020e	2021e	2022e	2023e	2024e
Net revenues	36 039	45 370	50 589	101 352	185 712	315 160	424 767	525 382
Other revenues	729	615	-	-	-	-	-	-
Total revenues	36 768	45 985	50 589	101 352	185 712	315 160	424 767	525 382
Cost of goods sold	(22 347)	(30 057)	(28 778)	(59 855)	(112 713)	(195 921)	(265 148)	(326 961)
Personnel costs	(19 476)	(23 854)	(29 808)	(32 541)	(36 314)	(40 868)	(45 314)	(48 845)
Other external costs	(22 993)	(22 481)	(26 743)	(29 287)	(32 683)	(36 782)	(40 782)	(43 960)
Other operating expenses	(722)	(120)	50	-	-	-	-	-
EBITDA	(28 770)	(30 527)	(34 690)	(20 330)	4 001	41 589	73 524	105 615
Amortisation & depreciation	(4 319)	(2 725)	(3 477)	(3 773)	(4 215)	(4 621)	(4 951)	(5 220)
EBIT	(33 089)	(33 252)	(38 167)	(24 104)	(214)	36 968	68 573	100 396
Financials, net	(82)	(52)	(137)	(90)	(90)	(90)	(90)	(90)
EBT	(33 171)	(33 304)	(38 304)	(24 194)	(304)	36 878	68 483	100 306
Taxes	-	-	-	-	-	-	-	-
Net profit	(33 171)	(33 304)	(38 304)	(24 194)	(304)	36 878	68 483	100 306
Earnings per share (SEK)	(1,35)	(1,30)	(0,89)	(0,49)	(0,01)	0,72	1,33	1,95
Growth (%)								
Net revenues	na	na	na	na	na	na	na	na
EBITDA	na	na	na	na	na	939,4%	76,8%	43,6%
EBIT	na	na	na	na	na	na	85,5%	46,4%
Net profit	na	na	na	na	na	na	85,7%	46,5%
% of revenues (%)								
EBITDA margin	neg	neg	neg	neg	2,2%	13,2%	17,3%	20,1%
EBIT margin	neg	neg	neg	neg	neg	11,7%	16,1%	19,1%
EBT margin	neg	neg	neg	neg	neg	11,7%	16,1%	19,1%
Profit margin	neg	neg	neg	neg	neg	11,7%	16,1%	19,1%
Personnel costs	54,0%	52,6%	58,9%	32,1%	19,6%	13,0%	10,7%	9,3%
Total OPEX	119,8%	102,4%	111,7%	61,0%	37,2%	24,6%	20,3%	17,7%
Profitability (%)								
ROE	neg	neg	neg	neg	neg	50,1%	48,2%	41,4%
ROIC	neg	neg	neg	neg	neg	58,9%	110,8%	146,0%
ROCE	neg	neg	neg	neg	neg	34,9%	35,4%	31,1%

Source: Västra Hamnen Corporate Finance

Balance Sheet - Annual Data

kSEK	2017	2018	2019e	2020e	2021e	2022e	2023e	2024e
Inventories	7 589	5 499	5 964	12 628	23 295	37 640	47 254	57 767
Short term receivables	10 021	6 869	12 820	26 610	47 486	75 274	94 714	116 179
Cash and cash equivalents	40 633	11 165	11 629	13 513	3 266	33 676	102 808	197 771
Total current assets	58 243	23 533	30 413	52 750	74 048	146 590	244 776	371 717
Tangible assets	1 148	1 309	1 778	2 561	3 570	4 392	5 061	5 606
Intangible assets	14 934	15 316	16 218	17 662	18 837	19 795	20 575	21 210
Total fixed assets	16 082	16 625	17 996	20 223	22 407	24 187	25 636	26 816
Total assets	74 325	40 158	48 409	72 973	96 455	170 777	270 412	398 534
Accounts payable	7 895	6 035	5 180	10 774	20 288	35 266	47 727	58 853
Short term liabilities	7 727	8 566	7 770	16 161	30 432	52 899	71 590	88 280
Total current liabilities	15 622	14 601	12 950	26 935	50 721	88 165	119 316	147 133
Long term liabilities	10 400	9 800	9 227	9 000	9 000	9 000	9 000	9 000
Other provisions	-	550	-	-	-	-	-	-
Total equity	48 303	15 207	26 232	37 038	36 734	73 613	142 096	242 401
Total equity and liabilities	74 325	40 158	48 409	72 973	96 455	170 777	270 412	398 534

Source: Västra Hamnen Corporate Finance

Cash flow statement

kSEK	2017	2018	2019e	2020e	2021e	2022e	2023e	2024e
Operating activities	(28 852)	(30 359)	(34 798)	(20 421)	3 911	41 499	73 434	105 525
Changes in working capital	(659)	4 771	(8 630)	(6 468)	(7 758)	(4 689)	2 098	(4 161)
Investing activities	(2 296)	(3 280)	(4 836)	(6 000)	(6 400)	(6 400)	(6 400)	(6 400)
Financing activities	(500)	(600)	48 727	34 773	-	-	-	-
Cash flow for the period	(32 307)	(29 468)	464	1 884	(10 246)	30 410	69 131	94 964
Beginning cash balance	72 940	40 633	11 165	11 629	13 513	3 266	33 676	102 808
Ending cash balance	40 633	11 165	11 629	13 513	3 266	33 676	102 808	197 771

Source: Västra Hamnen Corporate Finance

Income Statement - Quarterly Data

kSEK	Q3 2018	Q4 2018	Q1 2019	Q2 2019e	Q3 2019e	Q4 2019e	Q1 2020e	Q2 2020e
Net revenues	16 963	11 083	9 657	11 589	13 746	15 598	18 653	22 867
Other revenues	21	25	-	-	-	-	-	-
Total revenues	16 984	11 108	9 657	11 589	13 746	15 598	18 653	22 867
Cost of goods sold	(10 989)	(7 598)	(5 352)	(6 495)	(7 859)	(9 071)	(10 764)	(13 537)
Personnel costs	(5 966)	(7 595)	(6 801)	(7 650)	(7 669)	(7 688)	(7 934)	(7 954)
Other external costs	(3 969)	(7 217)	(6 036)	(6 885)	(6 902)	(6 919)	(7 141)	(7 159)
Other operating expenses	8	17	50	-	-	-	-	-
EBITDA	(3 932)	(11 285)	(8 482)	(9 442)	(8 685)	(8 081)	(7 187)	(5 782)
Amortisation & depreciation	(675)	(735)	(947)	(819)	(840)	(871)	(900)	(930)
EBIT	(4 607)	(12 020)	(9 429)	(10 260)	(9 525)	(8 952)	(8 086)	(6 712)
Financials, net	(191)	(10)	(54)	(36)	(24)	(23)	(23)	(23)
EBT	(4 798)	(12 030)	(9 483)	(10 297)	(9 549)	(8 975)	(8 109)	(6 735)
Taxes	-	-	-	-	-	-	-	-
Net profit	(4 798)	(12 030)	(9 483)	(10 297)	(9 549)	(8 975)	(8 109)	(6 735)
Earnings per share (SEK)	(0,13)	(0,33)	(0,27)	(0,22)	(0,20)	(0,19)	(0,17)	(0,13)
Y-o-Y Growth (%)								
Net revenues	na	na	na	na	na	na	na	na
EBITDA	na	na	na	na	na	na	na	na
EBIT	na	na	na	na	na	na	na	na
Net profit	na	na	na	na	na	na	na	na
% of revenues (%)								
EBITDA margin	neg	neg	neg	neg	neg	neg	neg	neg
EBIT margin	neg	neg	neg	neg	neg	neg	neg	neg
EBT margin	neg	neg	neg	neg	neg	neg	neg	neg
Profit margin	neg	neg	neg	neg	neg	neg	neg	neg
Personnel costs	35,2%	68,5%	70,4%	66,0%	55,8%	49,3%	42,5%	34,8%
Total OPEX	58,5%	133,5%	132,4%	125,4%	106,0%	93,7%	80,8%	66,1%
Profitability (%)								
ROE	neg	neg	neg	neg	neg	neg	neg	neg
ROIC	neg	neg	neg	neg	neg	neg	neg	neg
ROCE	neg	neg	neg	neg	neg	neg	neg	neg

Source: Västra Hamnen Corporate Finance

Balance Sheet - Quarterly Data

kSEK	Q3 2018	Q4 2018	Q1 2019	Q2 2019e	Q3 2019e	Q4 2019e	Q1 2020e	Q2 2020e
Inventories	8 207	5 499	5 928	6 406	5 168	5 964	7 078	8 901
Short term receivables	14 226	6 869	7 799	9 525	11 298	12 820	15 331	18 795
Cash and cash equivalents	18 191	11 165	7 979	35 240	22 989	11 629	1 580	27 080
Total current assets	40 624	23 533	21 706	51 172	39 455	30 413	23 989	54 776
Tangible assets	856	1 309	1 242	1 430	1 608	1 778	1 989	2 190
Intangible assets	14 430	15 316	15 134	15 377	15 808	16 218	16 607	16 977
Total fixed assets	15 286	16 625	16 376	16 807	17 417	17 996	18 596	19 166
Total assets	55 910	40 158	38 082	67 979	56 871	48 409	42 586	73 942
Accounts payable	-	6 035	-	5 478	4 915	5 180	6 154	7 422
Short term liabilities	18 750	8 566	12 802	8 217	7 372	7 770	9 231	11 132
Total current liabilities	18 750	14 601	12 802	13 695	12 287	12 950	15 385	18 554
Long term liabilities	9 950	9 800	19 527	9 527	9 377	9 227	9 077	9 000
Other provisions	-	550	-	-	-	-	-	-
Total equity	27 209	15 207	5 753	44 756	35 207	26 232	18 123	46 388
Total equity and liabilities	55 909	40 158	38 082	67 979	56 871	48 409	42 586	73 942

Source: Västra Hamnen Corporate Finance

Kassaflödesanalys - kvartalsvis data

kSEK	Q3 2018	Q4 2018	Q1 2019	Q2 2019e	Q3 2019e	Q4 2019e	Q1 2020e	Q2 2020e
Operating activities	(4 131)	(11 256)	(8 507)	(9 478)	(8 709)	(8 104)	(7 209)	(5 805)
Changes in working capital	(3 391)	6 466	(3 720)	(1 311)	(1 943)	(1 656)	(1 189)	(2 118)
Investing activities	(257)	(2 086)	(686)	(1 250)	(1 450)	(1 450)	(1 500)	(1 500)
Financing activities	(150)	(150)	9 727	39 300	(150)	(150)	(150)	34 923
Cash flow for the period	(7 929)	(7 026)	(3 186)	27 261	(12 251)	(11 360)	(10 048)	25 500
Beginning cash balance	26 120	18 191	11 165	7 979	35 240	22 989	11 629	1 580
Ending cash balance	18 191	11 165	7 979	35 240	22 989	11 629	1 580	27 080

Source: Västra Hamnen Corporate Finance

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