

# PiezoMotor

Sector: Industrial Goods & Services

## Piezo entering next growth phase

Redeye initiates coverage of PiezoMotor, a producer of small piezoelectric motors for niche applications. The company is an established player with exciting prospects going forward. We believe the coming launch of a new product for high-volume applications will yield strong sales growth and increased profitability, due to strong operating leverage. However, a stretched valuation means limited upside until additional catalysts occur.

### Strong moat within growing niche market

PiezoMotor has developed high-end micro motors based on piezo technology over the last 20 years. The company has built up extensive know-how that is difficult and time-consuming for competitors to replicate, yielding a strong moat. PiezoMotor has established a global customer base of over 100 customers that currently buy 5,000 motors annually from the company. The company estimates its addressable market to over USD 1bn, giving it plenty of room for further growth. The total micro motor market is believed to grow at around 5% annually. PiezoMotor's niche of linear piezo motors is expected to grow even faster than the overall market, spurred on by trends such as motorization and miniaturization.

### New initiatives yielding growth

PiezoMotor has experienced substantial sales growth of around 25% over the last few years. The company has set up several strategic initiatives to accelerate growth going forward, including i) launching the new product platform Piezo LINK for high-volume applications, ii) more dedicated sales resources, and iii) moving into systems sales on top of the current components sales.

### We value PiezoMotor to SEK 34 per share

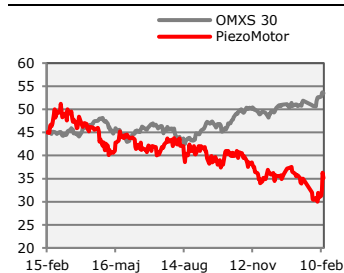
With its high-end technology and durable moat in a growing market, we see strong sales growth and increased profitability in the pipeline for PiezoMotor. We forecast that sales will amount to more than SEK 200m in 2025. Given the company's operating leverage, this will boost profitability, resulting in break-even being reached in 2022. Furthermore, we expect EBIT-margin to reach 30% in 2025. We argue that these prospects warrant a **fair value of SEK 34 per share**, with a **fair value range of SEK 11 to SEK 62 per share**. Given that the share is currently trading above SEK 35 per share, we see no further upside until one or several catalysts materializes.

KEY FINANCIALS (SEKm)	2018	2019	2020E	2021E	2022E	2023E
Net sales	26	31	42	68	98	150
EBITDA	-20	-12	-8	2	21	41
EBIT	-21	-13	-9	-3	15	35
EPS (adj.)	-1.5	-0.9	-0.6	-0.2	1.0	2.4
EV/Sales	24.0	16.8	12.2	7.7	5.2	3.2
EV/EBITDA	-31.0	-42.8	-61.2	265.8	25.0	11.7
EV/EBIT	-29.9	-40.1	-55.9	-168.9	34.4	13.7
P/E	-31.8	-40.7	-56.0	-148.8	35.6	14.8

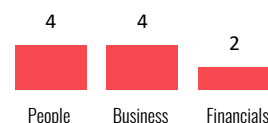
### FAIR VALUE RANGE

BEAR	BASE	BULL
11	34	62

### VERSUS OMXS30



### REDEYE RATING



### KEY STATS

Ticker	PIZEO.ST
Market	First North
Share Price (SEK)	35.6
Market Cap (MSEK)	515
Net Debt 20E (MSEK)	-1
Free Float	49 %
Avg. daily volume ('000)	17

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## Investment Thesis

- PiezoMotors has a strong market position within its niche of high quality and reliable piezo components. The company made its first commercial launch over ten years ago and is today an established manufacturer with a global customer base.
- The overall micro motor market is showing good growth, at an estimated 5% per year. The piezo segment, which is growing somewhat faster than that, is gradually gaining ground over electromagnetic motors, as the technology matures and gets more mainstream.
- In the last 3-4 years, PiezoMotors' product sales have grown around 25% per year. We believe the company will grow even faster in the next few years. The launch of a new motor for the mass market by the end of 2020 is one of the reasons for this. Also, the company has an ambition to gradually move from a component supplier to a systems provider, growing the scope of their business substantially.
- Given PiezoMotor's strong position and excellent growth outlook, our **fair value is SEK 34 per share** in a base case. We also believe a fair value range to be from **SEK 11 to SEK 62**.

**Niche company with a strong moat.** PiezoMotor gained its first customer already in 2002 and had its commercial launch of piezo motors in 2008. Since then, the company has grown sales continuously, and with a couple of exceptions, each year during 2008-19. Today, they have over 100 customers buying a total of around 5,000 piezo motors annually. The customer base is truly global, with several large OEM's placing repeat orders.

*Extensive know-how yields moat*

In our view, the company has a strong brand and an excellent position within its niche of high-end products. This position has been acquired over several years from focused R&D efforts into piezo material and the design of piezo motors and drives. In addition to this, the company has successfully developed integrated manufacturing processes. All and all, this know-how and IP, which to some extent is patented, is a great moat that will last for years, giving PiezoMotor an excellent competitive edge.

**New growth initiatives.** PiezoMotor is now planning for significantly stronger growth in the coming years. This is based on a number of strategic initiatives, including:

- launch of an entirely new piezo motor for the mass market, Piezo LINK
- more dedicated sales resources
- more systems sales rather than components only

The company is enjoying high gross margins. The bill-of-materials margin is typically over 70%; hence operational leverage is significant. PiezoMotor is targeting a long-term EBITDA-margin of 25-30%. We believe the company will reach break-even in 2022.

*TAM of USD 1bn*

**Growing niche market.** PiezoMotor estimates the total micro motor market to around 2bn units corresponding to a value of USD 30bn annually. The bulk is, however, still electromagnetic motors, while the TAM for piezo motors is estimated to exceed USD 1bn. Hence even in an unchanged market, the company can grow vigorously by just gaining market share.

While piezo motors have been around for decades, they are still, to some extent, considered a novelty. As the understanding of the piezo technology gets more widespread, it is gradually gaining ground on electromagnetic motors. The main disadvantage is still price in many applications, making electromagnetic motors the preferred choice for these.

The advantages of piezo motors versus electromechanical motors include higher accuracy with nanometer precision, compact design with no gearbox needed for linear solutions, lower energy consumption, high force vs. size, longer lifetime, non-magnetic and robustness in harsh environments. In addition to piezo replacing electromagnetic motors, there are new applications for smaller and more affordable piezo motors. This is the segment that the company will address with the new Piezo LINK motor.

**We value PiezoMotor to SEK 34 per share.** Given PiezoMotor's solid position in a growing niche market, we believe it has great prospects going forward. The company's high-end piezo motors and expansion plans, we believe, will result in excellent future financial performance.

We estimate that sales from the new Piezo LINK will yield sales of around SEK 125m in 2025, whereas other products will generate over SEK 80m, totaling SEK 200m in 2025. We forecast that EBIT-margin will reach 30%, due to the strong operating leverage. Hence, fair share value is **SEK 34 per share** in a base case scenario, with a **fair value range of SEK 11 to SEK 62 per share**. Given that the share is trading above SEK 35 per share, we see no further upside at the moment. To justify a higher share price, we want to see one or several catalysts occur.

## Key Catalysts

**Large orders from strategic OEM's.** This is probably the most likely catalyst to materialize as PiezoMotor already has several clients like this. It is more a question of when and what rather than if, this will happen. Confirmation of new orders is, however, important to support our growth assumptions.

**Successful launch of Piezo LINK.** Since this is a low-cost motor targeting a mass market, the key to success is highly automated manufacturing. Confirmation that the announced start of production by the end of 2020 is on schedule is important.

**Acquisition to broaden the business scope.** PiezoMotor is primarily supplying the vital piezo motor components that are integrated into a system solution. The company's ambition is to broaden its business scope and offer more complete solutions, either organically or by acquisitions.

## Counter Thesis

**Too slow growth.** A company with revenues of around SEK 30m and negative earnings obviously needs to grow substantially to justify a market cap around SEK 500m. A sales CAGR of 26% (2016-19) is not quite enough, hence market expectations are probably already higher for the coming years. The strategic growth initiatives outlined above could certainly be delayed or, in the worst case, even fail. Serious setbacks in the launch and ramp-up of Piezo LINK would be detrimental.

**Bad acquisitions.** PiezoMotor has communicated that acquisitions could be a part of the strategy to reach its growth targets. Acquisitions always include some degree of risk, and the company does not have a track record in this field.

**Dependence on a single distributor.** Faulhaber is a major shareholder but also their most important distributor, accounting for around 50% of sales. So far, this has not been a problem. On the contrary, it has benefitted PiezoMotor greatly. But being dependent on a single distributor to this degree constitutes a risk.

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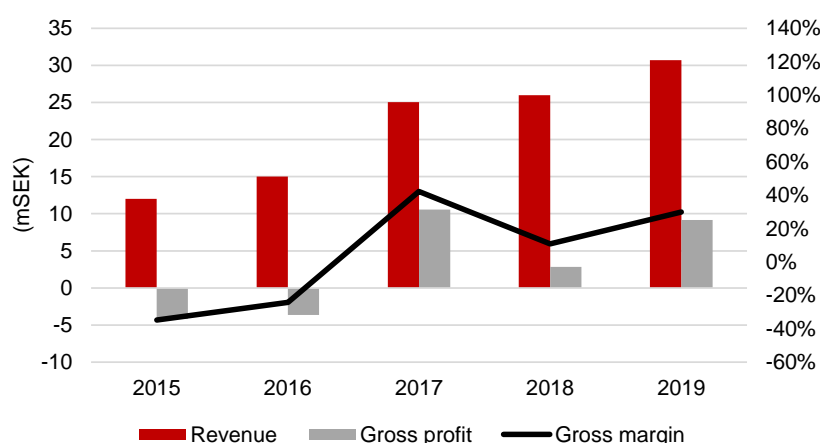
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## Company Overview

PiezoMotors develops, manufactures, and sells motors based on piezo technology, for a number of different niche applications. The company has developed three product platforms – Piezo LEGS, Piezo WAVE and Piezo LINK, with slightly different characteristics. The main benefits of a piezo motor in comparison to an ordinary electromagnetic motor are mainly higher precision, compact design, lower energy consumption, no backlash, and that it is non-magnetic.

As of now, the company's largest customer segments are medtech and semiconductor companies, which both constitute almost 40% of sales, respectively. Other customer segments include advanced optics and automation. PiezoMotor manufactures the motors at its production facility in Uppsala and plans to expand the production capacity with a highly automatized production line in the coming year. The company currently has around 30 employees. PiezoMotor had revenue of SEK 31m in 2019, with a gross margin hovering slightly below 20% over the last couple of years. The company has experienced strong sales growth over the last few years and currently has around 100 customers.

**PiezoMotor: Revenue, gross profit and gross margin\***



\*Includes initial payment from Physik Instrumente in Q2'17

Source: PiezoMotor

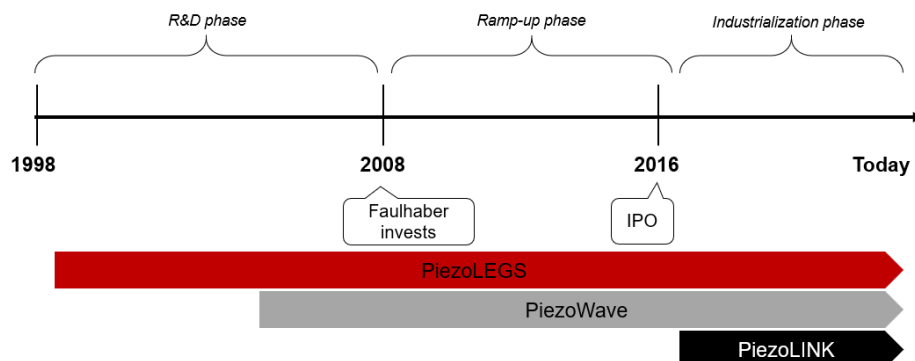
Going forward, the focus is to continue to grow the business with existing customers, by both increasing volumes and by moving more towards selling system solutions rather than piezo motors as single components. The company also intends to add new products particularly aimed at high-volume applications, such as telecom, for example.

## History & Milestones

PiezoMotor was founded in 1998 by the chairman Adam Dahlberg together with two researchers from Ångström Lab, at Uppsala University. The idea was to commercialize the research that had been done at the university and develop products based on piezo technology. In the first ten years, the company was mostly in an R&D phase and developed its first two product platforms – Piezo LEGS and Piezo WAVE. The development was partly funded through collaborations with large companies such as Nokia and Ericsson. The company gained its first customer in 2002.

In 2008 the company Faulhaber invested in PiezoMotor, which enabled the company to build the first real production line and ramp up production. PiezoMotor was listed on NASDAQ First North in June 2016. The company signed a licensing deal with its competitor Physik Instrumente in Q2'17, where Physik Instrumente pays a royalty to use some of PiezoMotor's IP. At the end of 2017, PiezoMotor signed a development and license deal with a large

technology company where the aim was to develop a new product platform – Piezo LINK. The company has recently completed the third phase of the project.



## Q4'19 – Considerable uptick

PiezoMotor's Q4'19 was a financially strong quarter, and the company showed strong sales growth and increased margins. The surprising part of the report was that the board and management estimate that the company's current cash position, of around SEK 17m, is sufficient to cover its cash needs in 2020.

CEO Kottenauer also confirms the previously communicated strategic focus, including high-volume applications and moving into system production. He also reiterates the plans to invest in a new production line. The company has placed the first order for production equipment and started to recruit additional staff. The line is to be finalized before the end of 2020. Given that PiezoMotor does not currently see a need to raise additional capital, we conclude that it will primarily lease the production equipment needed.

Sales in the quarter came in at SEK 12.3m (SEK 8.6m), putting the full year at SEK 30.7m (SEK 26.0m). This yields a total quarterly revenue growth of 43% compared to Q4'18, and 18% in total for 2019. However, product sales grew by 35% Y/Y. We believe that the growth was probably driven mainly by the large order of SEK 5m that the company received from a Chinese semiconductor player, at the beginning of the quarter. Due to PiezoMotor's strong operating leverage, we note significantly improved margins, both on a gross and EBIT-margin level. For the quarter, gross margin was 47% (5%), putting full-year gross margin at 30% (11%). The EBIT-margin came in at 25% (-91%) in Q4'19, but for the full year, it is still negative.

## Share price development

PiezoMotor was listed on NASDAQ First North at the beginning of June 2016. From the first close of SEK 12.5 per share, the share peaked in June 2018 at SEK 61 per share. Since then, the share has gone down almost 50% to around SEK 35 per share. In the graph below, we have noted some important company news and events.

**PiezoMotor: Share price development**



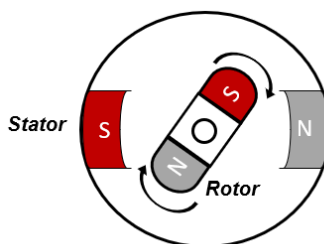
Source: Bloomberg & PiezoMotor

## Introduction to Micro Motors

Today there is some form of electric motor in many different products, including cars, consumer electronics, and medical devices. A motor transforms electrical energy into mechanical energy or, more simply put, it converts electricity into movement. The motor market is very broad, given the wide range of applications. PiezoMotors' target market can be narrowed down to micro motors, i.e., small motors used for niche applications. There are two main types of micro motors: piezoelectric motors and electromagnetic motors. We will give a brief overview of the characteristics of these motors.

### Electromagnetic motors

Electromagnetic motors are the most common type of electric motor overall. It has a long history and was first developed a couple of hundred years ago. An electromagnetic motor converts electricity to motion using electromagnetic fields. There is a host of different types of electromagnetic motors. In its simplest form, an electromagnetic motor can consist of a static magnet, the stator, and an electromagnetic coil, the rotator, see picture. When an electric current is passed through the coil, it creates a circular magnetic field around it. The two magnetic fields interact so that the rotator is rotated, thus generating movement.



The benefits of the electromagnetic motor are that it is a conventional, mainstream technology that has been refined for many years. It can also be produced at a low cost, implying that electromagnetic motors are competitive on price. There are, however also some downsides to electromagnetic motors. One disadvantage is that the motor needs many additional parts, such as rotor, stator, gearbox and other components, which limits how small in size the total systems can be.

In many applications, the movement created by the motor is supposed to be linear. Since many electromagnetic motors create a rotating movement, as illustrated above, the motor has to transform it into a linear movement in these cases, through additional components. This increases the complexity of electromagnetic motors further.

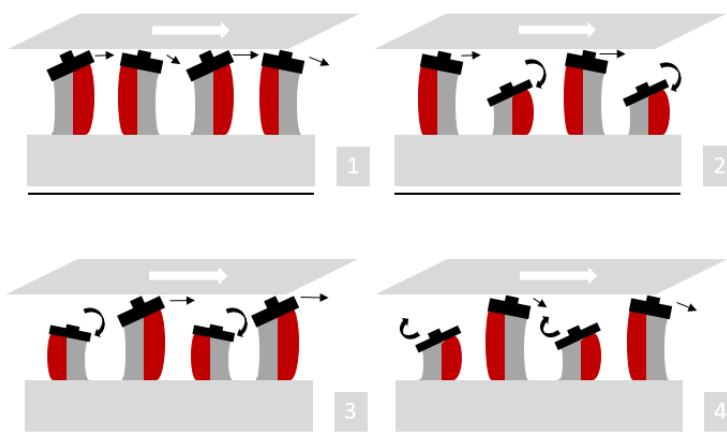
Another disadvantage is that since the driving mechanism in the motor is based on the use of magnetic fields, the motor will always create magnetic fields also in the space around it. In many applications, this is not an issue. However, for some applications where there is a risk that the fields will interact with other magnetic fields, this is a problem. One such example is some medtech applications, where the motor is placed within an MRI.

An important concept is backlash. Backlash is the mechanical term for lost precision in a mechanical system, which is caused by gaps between parts. This means that one part of the system can be moved, without applying force or moving the adjacent parts in the mechanical sequence. Since an electromagnetic motor consists of many different parts, some backlash always occurs. It hampers the precision and makes electromagnetic motors unsuitable for high-precision applications.

## Piezoelectric motors

Piezoelectric motors are based on an entirely different mechanism than electromagnetic motors. A piezoelectric motor creates motion through the use of a special material that changes its shape when an electric current is passed through the material. The special material used is referred to as piezo material. Examples of materials that have this kind of piezoelectric characteristics are crystals or electroceramics.

The picture below illustrates a type of piezoelectric motor that uses a so-called walking drive principle. Several piezoelectric actuators are mounted in a row. The actuators are activated in pairs by an electric current that is run through the actuators. This causes the actuators to expand and bend, effectively walking along the longitudinal rod, as shown below.



Source: Redeye Research



A piezoelectric motor can use several other drive mechanisms. PiezoMotor uses, apart from the walking drive principle, also the ultrasonic drive principle, in its motors. When using the ultrasonic drive principle, an oscillation, in the form of ultrasonic vibrations, is induced in the piezo material. The oscillation creates movement in a so-called pusher that makes it move a longitudinal rod.

There are substantial advantages to using piezoelectric motors. They eliminate the need for additional components, such as gearboxes and ball screws. Hence, the complete system can be made up of relatively few parts and be very small in size. The motors can be made lighter and quieter compared to conventional electromagnetic motors. There is no magnetism used, and the motors can be used in applications where magnetism from an electromagnetic motor would cause problems. Another advantage is that the motor has very high precision and is ideal for the positioning of objects. It can move an object with nanometer precision and hold the object in a certain position, without requiring additional power.

One disadvantage of piezo motors is the higher cost. However, given that there has been a strong trend towards miniaturization in many applications, piezo motors are the only alternative that can fulfill the size requirements. Also, since the motor requires fewer additional components, the cost for the entire motion system can be lower compared to the corresponding system based on an electromagnetic motor.

For many years, piezoelectric motors were viewed as a rather high-cost, niche technology. Over the last few years, with the technological development that has taken place, piezoelectric motors have become a more viable alternative to electromagnetic motors. The market has become more aware of the possibilities and benefits of the technology, and it has started to be seen as more mainstream, according to PiezoMotor.

<b>PiezoMotor: Comparison piezoelectric &amp; electromagnetic motors</b>	
<b>Piezoelectric motors</b>	<b>Electromagnetic motors</b>
High precision, down to single nanometers	Mainstream technology
Non-magnetic	Limited precision
No backlash	Magnetic
Self-locking, no power requirement in locked position	Backlash
Compact design	Require power to hold a locked position
High force versus size	Require several parts, stator, rotor, gearbox etc.
Cost-efficient in relation to performance	Low cost

Source: PiezoMotor & Redeye Research

## Product Offering

PiezoMotor’s product offering consists of three main product platforms: Piezo LEGS, Piezo WAVE and Piezo LINK. There are some different variations of these three platforms, and most customers order one of these standardized motors. However, for a few customers, the company also develops customized motors, but this is less common.

The main differences between the product platforms are in terms of size, force, and driving principle, and are outlined below. Most of PiezoMotor’s products are linear motors, but they have some rotary models as well. All motors are designed so that they have a lifetime such that they can be run for distances up to at least 10 km. In room-temperature, this number increases in practice up to 40 to 50 km., according to PiezoMotor.

### Piezo LEGS

Piezo LEGS was the first product platform developed by PiezoMotor. The product platform is based on the walking drive principle, described in the section above. The motor can produce forces between 5 and 450 Newton, which is equivalent to around 0.5 to 45 kg. The precision is very high – down to single nanometers. Piezo LEGS is a high-end product designed for precision applications, and the volumes are usually low, i.e., up to 10,000 units. This platform currently makes up a majority of PiezoMotor’s sales, and the price ranges from SEK 1,000-

75,000. The product's primary application areas are within medtech, advanced optics, and the semiconductor industry.



Piezo LEGS

## Piezo WAVE

Piezo WAVE is the second product platform developed by PiezoMotor. As opposed to Piezo LEGS, Piezo WAVE is based on the ultrasonic drive principle, and it can generate a force of 0.1 Newton, which is equivalent to around 10 grams. Piezo WAVE is very small in size, measuring only 14x5x7 mm. The motor has a low weight of less than 1 gram and is relatively easy to produce in high volumes, according to PiezoMotor. The platform was originally developed within a project together with Nokia around 2005, where the aim was to motorize the camera lens of a cellphone. That project did not reach commercial-stage, but today the motor is used for applications within medtech, optics, consumer electronics, and other low force applications.



Piezo WAVE

## Piezo LINK

The latest developed product platform is called Piezo LINK. This motor has been developed together with a leading undisclosed technology company since the end of 2017. Piezo LINK has many of the advantages of Piezo WAVE but is capable of producing a higher force. The motor is based on an ultrasonic drive principle, just as Piezo WAVE, and it can generate forces between 2 and 3 Newton, which is equivalent to 0.2-0.3 kg. According to PiezoMotor, there is room for further improvement, so that Piezo LINK could generate even more force with additional product development. The motor is small, low-weight, and designed for high-volume manufacturing, according to the company. PiezoMotor has also communicated a low price point in the "single dollar" range, i.e., less than USD 10 per unit. A price point that low opens up for many high-volume applications, and makes the motor a serious competitor to electromagnetic motors.

There are several interesting application areas for Piezo LINK. The leading tech company funding the development will have the exclusive right to use the motor for one specified, but undisclosed, application area, whereas PiezoMotor is allowed to produce and sell within other applications. PiezoMotor has pointed out areas that the company believes to be of interest

going forward, including telecom, medtech and automation/robotics. However, given the early stage of the product, we believe that it is difficult to say which will be the primary application area.

## Operations & Customers

PiezoMotor is currently producing and selling Piezo LEGS and Piezo WAVE. The company has around 100 paying customers, of which one customer constitutes more than 10% of sales. Many customers are recurring on an annual basis. Currently, the total annual volume is around 5,000 units, of which 4,000 is Piezo LEGS and 1,000 is Piezo WAVE. The price of a motor ranges from SEK 1,000 to 75,000, and 99% of sales come from outside of Sweden.

Up until now, PiezoMotor has had a small sales organization that has mostly focused on supporting the company's distributors. The company has mainly sold through distributors. However, the company says that it usually comes into contact with the end-customer, the OEM's, at some point during the sales process and that direct sales are becoming more and more common. The single largest distributor is Faulhaber, which stands for around 50% of all sales.

### Piezo LINK project

In 2017, PiezoMotor was approached by an undisclosed, leading technology and electronics company, and the parties signed a licensing and development deal. The aim was to develop a new micro motor concept based on PiezoMotor's piezo technology. The project has recently passed through its third phase, and it has resulted in the new product platform, Piezo LINK.

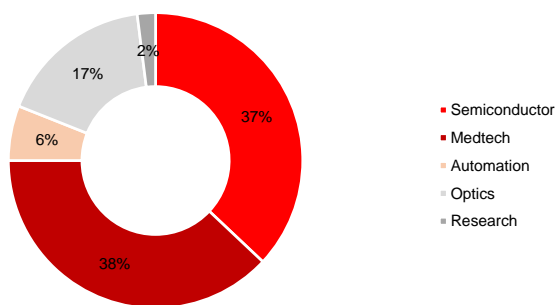
As mentioned, the deal entails that the large technology company has the right to use Piezo LINK for one specific application, whereas PiezoMotor has the right to produce and sell Piezo LINK for other applications, including medtech, telecom, and aerospace. The project is expected to yield a total of SEK 20m in NRE revenue for PiezoMotor if it is completed. As of now, SEK 10m has been recognized as revenue. PiezoMotor expects no additional revenue from this partner after the project is completed. The technology company has not up until this point indicated any interest in using PiezoMotor as a supplier of Piezo LINK, as far as we can understand. The business case for PiezoMotor lies within other application areas, where the company can commercialize the technology.

PiezoMotor already has a number of customers that have indicated an interest in Piezo LINK. At the beginning of 2018, the company announced that it had started collaborations with three global telecom players and that potential volumes amounted to several million units. Today, PiezoMotor says that it is in contact with a handful of telecom players. Some medtech companies are also evaluating Piezo LINK for high-volume applications.

### Customers

PiezoMotor has a diversified customer base. The main two customer segments in terms of industries are the semiconductor industry and medtech, which make up 37% and 38% of sales, respectively. Other customer segments include optics, automation, and research. The revenue split between customer segments has been rather stable over time.

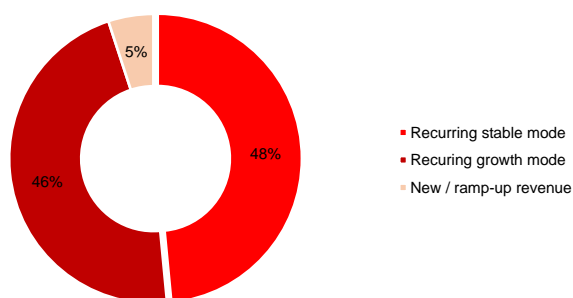
**PiezoMotor: Revenue split 2019 per customer segment**



Source: PiezoMotor

PiezoMotor has mostly recurring customers and almost no one-time business. According to the company, 48% of its customers are in a recurring stable mode, whereas 46% are in recurring growth, meaning that the size of the orders is expected to increase. The classification is based on what the company thinks the customers' intentions are going forward, and it changes slightly over time, according to PiezoMotor.

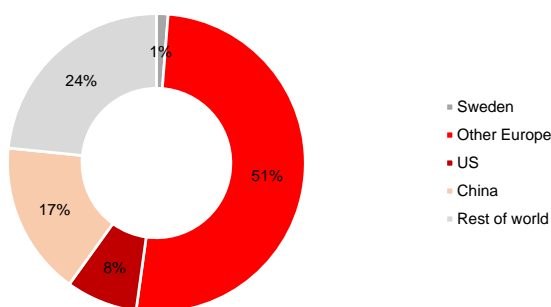
**PiezoMotor: Revenue split 2019 by type**



Source: PiezoMotor

When looking at the geographical revenue split, we note that only 1% of revenue is from Sweden. PiezoMotor's main market is Europe, which makes up more than half of sales. According to the company, other important markets include Japan, the U.S., and China.

**PiezoMotor: Revenue split 2018 per geographic segment**



Source: PiezoMotor

## Production & sourcing

PiezoMotor has all production at its facility in Uppsala, Sweden. The current production process turns raw piezo material into motors, through significant amounts of manual labor. Here the piezo material makes up 90% of total material cost. At the current volume of 5,000 units, this production set-up leads to rather low gross margins of around 20%. However, the capacity of the facility is 14,000 units annually of only Piezo LEGS motors, without any additional investment or added fixed costs, indicating substantial operating leverage as volumes increase. Given some smaller investments and additional staff, the capacity could rather easily be increased up to around 50,000-100,000 units per year, according to PiezoMotor.

The production process has been refined over many years, and the company stresses that it has developed substantial know-how over time. We recently visited the production facility in Uppsala. We got a good impression of the production; it seemed orderly and professional. We also met several people who had been with the company for a long time, which we believe to be a good sign. The most complex part of the production process is the production of the piezo components, especially for Piezo LEGS. Our view is that it would be difficult for a competitor to successfully replicate the process without extensive research.

PiezoMotors plans to make substantial investments into production going forward. The intention is to build a new, fully automated production line to be able to produce Piezo LINK at high volumes cost-efficiently. The production line is only supposed to do the last assembly of the motors, and the piezo components will probably be sourced from an external supplier. In the case of Piezo LINK, this is doable since the production process for the material is less much complex, according to PiezoMotor. The capacity is planned to be 5m units annually. The company has evaluated different financing options, including both leasing and paying in cash. Since PiezoMotor, in the Q4'19 report, communicated that its current cash is sufficient to cover its cash needs in 2020, we conclude that the company plans to lease the new production line. The plan is to finalize the new line before the end of 2020.

## Business Strategy

PiezoMotor's main business is to develop, produce, and sell piezoelectric motor components. In addition, the company has received revenue also from the license deal with Physik Instrumente, the development project with the leading technology company, as well as from some other NRE-projects. However, the main focus going forward is to grow the piezo motor business, mostly organically and also selling more systems rather than just components.

PiezoMotor pursues a product differentiation strategy, producing high-end motors. The company stresses that the price that the customers pay relate more to the value that is generated, rather than cost-plus pricing. According to the company, many customers are rather price-insensitive. This is particularly true for Piezo LEGS, where certain characteristics and performance are key to the clients' end products.

The price of a motor varies but usually lies in the range of SEK 1,000 – 75,000, as mentioned in the previous section. PiezoMotor has plans to increase prices substantially. Although 99% of revenue comes from outside of Sweden, the company still sets its prices in SEK. Hence, the depreciation of the SEK over the last years has made the products less expensive in relative terms. Hence, we believe that it should be possible to increase prices quite a bit, without losing customers.

PiezoMotor is currently in the process of setting up an online store. This is a marketing tool, where prospective customers can get information about prices, but also a direct link to end-customers. Given that piezo motors have been regarded as more expensive than the

competing technology, this is a way to inform potential customers of the approximate price point. PiezoMotor notes that some of its distributors have quite a hefty margin on its products and indicates that this may have harmed sales. The management believes that an online store could help increase pricing transparency and drive sales.

## Patents

An integral part of PiezoMotor's business strategy is the handling of IP and patents. The company has approximately 70 patents in key markets such as the U.S., Germany, Japan, and China. However, it has also been a deliberate decision not to patent certain know-how and processes, to avoid that it becomes public knowledge and keep it as a business secret.

In 2017, PiezoMotor signed a patent and collaboration deal with the German company Physik Instrumente. The parties had a patent dispute, which was resolved through the deal. It entailed that Physik Instrumente got a license to use some parts of PiezoMotor's patent portfolio and that the parties would collaborate to integrate Piezo LEGS into Physik Instrumente's advanced precision systems. PiezoMotor was given the right to be exclusive supplier of motors for these systems. The deal also included a down payment of EUR 1m, which was recognized as revenue in Q2'17 and also royalty revenue that is expected to amount to an additional SEK 20m. As of now, a total of SEK 22m has been recognized from the deal. As of now, there are four years left of the licensing deal.

## Strategic focus & targets

To grow the company further, CEO Kottenauer has identified a number of strategic focus areas. One of them is that the company wants to build and expand its sales organization, both the number of staff and geographically. Another is to go from selling piezo motors as single components to selling more systems that incorporate piezo motors. The third is to move into high-volume applications with the new product platform Piezo LINK. Together with PiezoMotor's plans to raise prices substantially, these initiatives should yield significant sales growth. CEO Kottenauer also indicates a long-term EBITDA-margin of 25-30%, which he believes to be attainable given SEK 100m in sales.

The new product platform Piezo LINK opens up for many new potential application areas due to its low cost. Going forward, perhaps the most important strategic target is to finalize the development of Piezo LINK and expand into high-volume applications. CEO Kottenauer sees great potential in both telecom and medtech.

Within telecom, the motors can be used, for example, for digital filters, microwave links, and in the positioning of antennas for both 4G and 5G applications. There are several aspects of the piezo technology that makes it particularly useful for telecom applications, especially the size, linear drive, self-locking property, non-magnetism, and its robustness when it comes to temperatures and damp environments. However, price is also a very important factor for this application.

PiezoMotor is currently in contact with a handful of telecom companies, that are in the process of testing the technology and performing other R&D activities. However, the commercialization of products for telecom applications will require further development of systems for the specific application areas. Some medtech companies are also evaluating Piezo LINK, according to the PiezoMotor. To be able to produce at high volumes, the company must also invest in production, see the section below.

Going forward, PiezoMotor wants to gain control of its distribution by building up a sales organization. This will enable the company to sell more directly to end-customers. It will primarily be done organically by hiring more sales staff, and the company is currently in the process of recruiting. However, it also sees the acquisition of a distributor as a viable alternative to increase presence in certain geographical regions in the future, which is another important objective. CEO Kottenauer points out geographical markets such as Central

Europe, especially the DACH region (i.e., Germany, Austria, and Switzerland), and the U.S, as particularly important.

At the moment, PiezoMotor sells only piezo motors. The motors are often used as components and incorporated into systems by the end-customer. According to PiezoMotor, around 70% of piezo components sold on the market are used in different kinds of systems. The company claims that customers often lack the capabilities to efficiently integrate the motors into systems, and hence sees an opportunity to move into producing systems, rather than only piezo motor components. This would also create substantial value for the customers. System solutions could be sold for 3-10x more compared to piezo motor components, according to the company. This strategic shift is initially to be accomplished organically. However, further down the road, PiezoMotor sees potential acquisitions as a way to gain traction and speed up the process.

## Market

It is somewhat difficult to get a grasp of PiezoMotor's market. The piezo motor market is rather small and fragmented, and there is a lack of credible industry reports. Hence, we will mainly focus on the market information obtained from PiezoMotor.

Given that electric motors are everywhere today, the total global market for electric motors is huge. The market size was in 2017 estimated to almost USD 100bn and was expected to grow at a CAGR of 4.5% until 2025<sup>1</sup>. However, the market of interest for PiezoMotor is rather the micro motor market. According to the company, the micro motor market is currently estimated to around 2bn units, corresponding to USD 30bn. This includes both electromagnetic and piezoelectric motors, as well as both linear and rotating motors. The market growth is estimated to approximately 5% annually.

The main market growth drivers are the trends towards motorization and miniaturization. More products are motorized than before, and electric motors replace manual adjustment in an increasing number of applications. In many of those, small size is pivotal. The trend toward smaller and smaller motors, i.e., miniaturization, seems to continue. Both of these trends should favor piezo motors going forward.

PiezoMotor's addressable market is estimated to over USD 1bn by the company. There are also indications that the subsegment piezoelectric motors seem to be growing at a higher rate than the market, approximately estimated at 7-8% annually, we believe. The total micro motor market comprises both linear and rotating motors, where linear motors stand for 80% of the market. According to PiezoMotor, the linear segment seems to be growing at a slightly higher rate compared to the whole market.

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<sup>1</sup> <https://www.electricmotorengineering.com/a-global-electric-motor-market-overview/>

## Competitors

PiezoMotor's competition consists of other companies producing piezo motors, but also companies that manufacture conventional electromagnetic motors. However, for many niche applications with high requirements concerning the precision, small size, power efficiency, and non-magnetism, piezo motors are the only viable alternative.

There are only a few other players that produce piezo motors, including Physik Instrumente and Nanomotion. Noteworthy is that the Japanese company Canon also produces piezo motors, but solely for the integration in its own products. PiezoMotor claims that they face more competition from electromagnetic motors than from piezo competitors. It is also common that the application in question is not currently motorized.

### Piezo competitors

The most direct competitors are companies that produce piezo motors. The most prominent competitors in this space are Physik Instrumente and Nanomotion, according to PiezoMotor, and the company views these two as its most serious competition. There are also some smaller piezo players, including Discovery Technology, TEKCELEO, New Scale Technologies, and Piezo Technologies. However, we believe these are less of a competitive threat, especially for high-precision applications, as they seem to offer products with lower resolution.

Physik Instrumente is a manufacturer of nanopositioning technology. The company's product offering includes a wide range of positioning components and systems, which are based on both piezo and electromagnetic solutions. The company has revenue of around SEK 1bn, but piezo motors are a smaller part of the overall business. PiezoMotor signed a patent- and licensing deal with Physik Instrumente in 2017, as mentioned previously. The deal has served as an acknowledgment of PiezoMotor's technological capability.

The other competitor, Nanomotion, on the other hand, focuses solely on piezo motors. It offers a range of piezoelectric motors and solutions aimed at defense optronics, medtech, the semiconductor industry, as well as at some other industries. PiezoMotor describes Nanomotion's motor as a hybrid between Piezo LEGS and Piezo WAVE, but with lower precision. It is relatively fast and based on ultrasonic drive. As we understand it, Piezo LINK will have a lower cost than Nanomotion's products.

As far as we can tell, PiezoMotor's product offering is very competitive, and the company is mainly challenged by Physik Instrumente within precision applications. Other competitors' offerings are not quite up to mark in terms of precision and can only handle precision down to around 10 nm, compared to PiezoMotor's precision of 1 nm.

If PiezoMotor broadens its offering to including systems, a couple of other competitors will arise. Attocube and SmarAct are two companies that specialize in high-precision positioning solutions. These players manufacture systems based on piezo components. According to PiezoMotor, these companies have focused on niche product solutions towards the research industry. They offer very high-end, high precision solutions but directed at very narrow applications. We thus believe that they pose less of a competitive threat.

### Electromagnetic competitors

PiezoMotor also meets electromagnetic competitors. The electromagnetic micro motor market is dominated by four players – Maxon Motor, Faulhaber, Namiki, and Portescap. These players are estimated to generate a total of approximately SEK 25bn in revenue. Given the pros and cons of electromagnetic motors outlined in the micro motor section, we can conclude that electromagnetic motors are only a viable alternative in certain applications. With disadvantages including magnetism, limited precision with backlash, and higher power requirements, the electromagnetic motor does not pose a threat in the applications with the



highest performance requirements. However, in applications where low cost is a prerequisite, including telecom, conventional motors are more competitive. We, therefore, believe it is pivotal for PiezoMotor to successfully develop Piezo LINK, such that cost per unit comes down to be able to grow in such applications.

## People

### Management & Board

PiezoMotor's management team has more experience than what might be obvious at first glance. CTO Andreas Danell has been with the company for more than 15 years in different positions. The current CEO, Anders Kottenauer, on the other hand, was appointed only last year. He brings experience from a range of industrial companies, where he mostly has held positions within sales and marketing. Most recently, he was the business unit manager at the British company Laird. We get the impression that the management has a business-oriented mindset as well as deep industry knowledge. The management's weak point is the lack of ownership; in total, the management holds less than 0.5% of the company. We would like to see that the management increases its shareholdings going forward. The management does hold options, as do a majority of the other employees. In total, the option program amounts to 450,000 options, which corresponds to a dilution of about 3% given the current number of shares outstanding.

PiezoMotor: Management					
Name	Position	Since	Shares	% of equity	Options
Anders Kottenauer	CEO	2019	0	0.00%	200 000
Olof Stranding	CFO	2013	10 000	0.07%	40 000
Andreas Danell	CTO	2018	} 25 000	0.17%	13 000
Sandra Reljanovic	Head of Design Engineering	2020			

Source: PiezoMotor

The board is led by PiezoMotor's main owner and co-founder, Adam Dahlberg, who is still operationally involved in the company. The other main owner Faulhaber is also well represented through Ping Faulhaber and Gert Frech-Walter. The former is the widow of the late Dr. Fritz Faulhaber, whose father founded Faulhaber, whereas the latter has held numerous positions at Faulhaber over the last 15 years. It should be noted that Dr. Henrik Nittmar is the CEO of Corline Biomedical, which is a listed pharma company with chairman Adam Dahlberg as the main owner. We conclude that the board has substantial holdings in the company as well as many years of experience from the industry.

PiezoMotor: Board of Directors					
Name	Position	Since	Shares	% of equity	Options
Adam Dahlberg	Chairman of the board	1999	2 851 809	19.71%	0
Gert Frech-Walter	Board member	2007	0	0.00%	0
Ping Faulhaber	Board member	2019	2 287 168	15.80%	0
Dr. Henrik Nittmar	Board member	1998	10 200	0.07%	0
Joakim Stenberg	Board member	2017	6 441	0.04%	0

Source: PiezoMotor

Overall, our impression is that PiezoMotor is a well-governed company. The company scores high on Redeye's people rating, boasting 4 points out of a maximum of 5 points. The management communicates in a straight-forward and honest way, and it demonstrates a business-oriented mindset. However, we would like to see that the management held more shares in the company. If the options are exercised this issue would be somewhat mitigated. However, the options expire in 2022, and the strike price is SEK 98.6.

## Owners

Large, long-term owners characterize PiezoMotor's ownership structure. Chairman Dahlberg owns almost 20% of the company, whereas Faulhaber has a stake of around 16%. LLC Gaudium is the investment company of Ping Faulhaber, and thus is the free float around 49%. The large shareholders are all represented on the board and effectively controls the company. Some larger institutions have also invested in the company, including Handelsbanken Fonder and Swedbank Robur Fonder.

PiezoMotor: Ownership		
Name	Shares (m)	Capital
Adam Dahlberg	2.85	19.7%
Dr. Fritz Faulhaber GmbH & Co. KG	2.29	15.8%
LLC Gaudium Ivst	2.29	15.8%
Handelsbanken Fonder	1.22	8.5%
Swedbank Robur Fonder	1.13	7.8%
LMK-bolagen & Stiftelse	0.71	4.9%
Avanza Pension	0.40	2.7%
Gunvald Berger	0.27	1.9%
Tibia Konsult AB	0.20	1.4%
Crossbow AB	0.18	1.3%
Others	2.95	20.4%
<b>Total</b>	<b>14.47</b>	<b>100.0%</b>

Source: PiezoMotor

## Financials & Valuation

This section includes PiezoMotor's P&L, our financial forecasts, and valuation. The valuation is based on both a DCF approach and multiples, presented in the sections below. In the usual Redeye fashion, we find a fair value range with a bear, base and bull scenario.

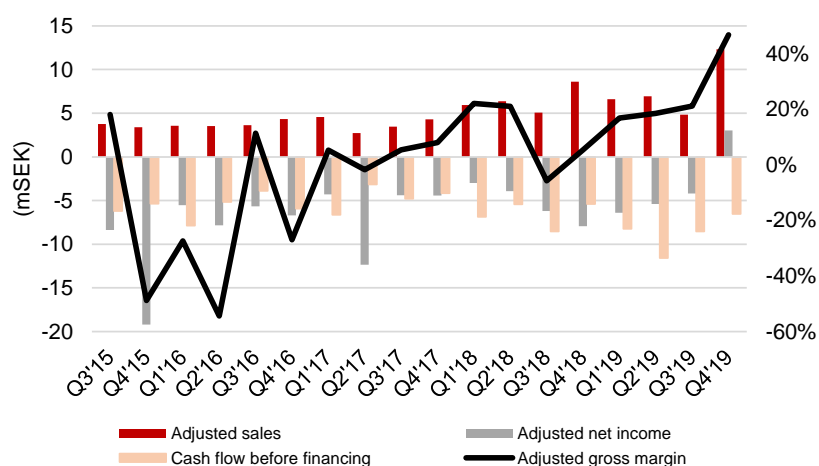
### Historical performance

PiezoMotor has grown substantially over the last years. The sales CAGR between 2016 and 2019 has been 26%, but the company is still making a loss at an EBIT level of SEK -13m. The gross margin has steadily increased to around 20% over the last couple of years if we exclude Q3-Q4 2018. These quarters were affected by a sales mix with a higher percentage of NRE project revenue, which has lower gross margins than component revenue.

PiezoMotor: Historical financials, unadjusted					
(mSEK)	2015	2016	2017	2018	2019
Revenue	12.0	15.0	25.0	26.0	30.7
COGS	-16.2	-18.6	-14.5	-23.1	-21.5
Gross profit	-4.2	-3.6	10.5	2.8	9.2
OPEX excl. D&A	-19.4	-17.5	-17.4	-22.9	-21.8
<b>EBITDA</b>	<b>-23.1</b>	<b>-21.0</b>	<b>-6.5</b>	<b>-20.1</b>	<b>-12.0</b>
D&A	-5.2	-4.0	-8.6	-0.7	-0.8
<b>EBIT</b>	<b>-28.3</b>	<b>-25.0</b>	<b>-15.2</b>	<b>-20.8</b>	<b>-12.8</b>
<i>Sales growth</i>	2%	25%	67%	4%	18%
<i>Gross margin</i>	-35%	-24%	42%	11%	30%

Source: PiezoMotor

The licensing contract closed with Physik Instrumente in 2017 yielded a one-time payment of EUR 1m, equivalent to SEK 9.6m, in Q2 2017. As previously mentioned, the total value of this deal is around SEK 30m, according to the company, of which SEK 22m has already been recognized.

**PiezoMotor: Quarterly financials\***

\*Adjusted for the initial payment from Physik Instrumente in Q2'17

Source: PiezoMotor

## Forecasts & DCF valuation

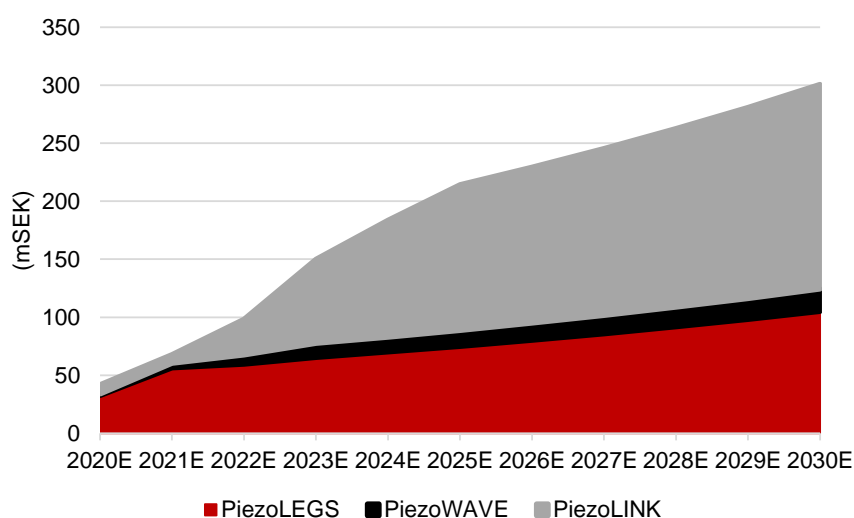
In the sections below, we will describe our financial forecasts in a base case, bear case and bull case scenario. We will detail our key assumptions in each scenario and value the share based on a DCF approach. The general key assumptions used in all scenarios are:

- Forecast period until 2030
- Terminal sales growth of 2%
- WACC of 11%
- Tax rate of 21%

The WACC is based on Redeye's rating. The rating assesses the company's quality on three dimensions: people, business, and financials, and each dimension is awarded a maximum of 5 points. In PiezoMotor's case, the company scores 4 points on people, 4 points on business and 2 points on financials.

### Base case

In the base case scenario, we assume that PiezoMotor continues to move forward with the communicated strategic focus areas. This includes investing in a new production line in 2020, which enables the full-scale commercial launch of Piezo LINK in 2021. The company moves forward with building up a sales organization and raising prices substantially, resulting in short-term sales growth. In the long-term, we see good sales potential, especially for Piezo LINK and Piezo LEGS within several applications such as telecom and medtech. We believe these two platforms will constitute a large majority of total sales in the long term. All in all, sales will reach SEK 300m at the end of our forecast period in the base case scenario.

**PiezoMotor: Sales per product**

Source: Redeye Research

There is substantial operating leverage in PiezoMotor's production. Since the company can almost triple production without additional investment or fixed costs, we expect that the gross margin will quickly surge when volumes increase. This translates into a gross margin rapidly approaching 60%, when volumes take off. We also expect that the new production line will enable gross margins that are comparable to that of the old production.

PiezoMotor has plans to expand its sales organization, and this will lead to increased sales costs going forward. The company has communicated that the number of staff will increase from 30 to 40 employees in the foreseeable future, with sales staff making up most of the addition. Hence, we expect that sales costs and thus OPEX will increase with SEK 5m until 2021.

We expect PiezoMotor to lease its new production line. This leads to a small increase in investments in tangible assets, amounting to SEK 3m in 2020 and SEK 4m in 2021-22.

<b>PiezoMotor: Base case forecasts</b>										
(mSEK)	Q1'2019	Q2'2019	Q3'2019	Q4'2019	2019	2020E	2021E	2022E	2023E	
Sales	7	7	5	12	31	42	68	98	150	
PiezoLEGS						33	57	60	65	
PiezoWAVE						2	4	8	12	
PiezoLINK						8	7	31	73	
COGS	-6	-6	-4	-7	-22	-25	-34	-41	-63	
Gross profit	1	1	1	6	9	17	34	57	87	
OPEX excl. D&A	-7	-6	-5	-3	-22	-27	-34	-38	-48	
<b>EBITDA</b>	<b>-6</b>	<b>-5</b>	<b>-4</b>	<b>3</b>	<b>-12</b>	<b>-8</b>	<b>2</b>	<b>21</b>	<b>41</b>	
D&A	0	0	0	0	-1	-1	-5	-6	-6	
<b>EBIT</b>	<b>-6</b>	<b>-5</b>	<b>-4</b>	<b>3</b>	<b>-13</b>	<b>-9</b>	<b>-3</b>	<b>15</b>	<b>35</b>	
Sales growth (Q/Q vs Y/Y)	77%	5%	-30%	155%	18%	37%	61%	45%	53%	
Gross margin	17%	19%	21%	47%	30%	40%	50%	58%	58%	
EBIT-margin	-96%	-77%	-86%	25%	-42%	-22%	-5%	15%	23%	

Source: Redeye Research

PiezoMotor had around SEK 17m in cash at the end of 2019 and had a burn rate during the last 12 months of SEK -35m. The company has communicated that it sees no need for additional capital injections during 2020. However, we believe that if opportunity arises, PiezoMotor may want to accelerate growth further and raise additional capital rather soon. Below we summarize our most important assumptions more in detail.

Our key assumptions are:

- Sales growth in 2020 will to a large extent come from price increases as the company is in the process of adjusting their prices following the depreciation of the SEK
- Volumes for Piezo LEGS continue to grow incrementally, gaining one or two larger orders in 2021, so that volumes reach 15,000 in 2023
- Piezo WAVE is also expected to show growth, but its portion of total revenue decreases
- The new Piezo LINK production line is built in 2020, and production starts in 2021
- Production of Piezo LINK is ramped up such that volumes reach around 1m units in 2023
- Piezo LINK volumes continue to increase and reach 2.5m units in 2026
- Sales CAGR from 2020 to 2025 is 38%
- The gross margin gradually increases towards almost 60%
- Other costs increase moderately, keeping OPEX rather low
- EBIT-margin peaks at around 30% during the forecast period
- Long-term EBIT-margin is 25%
- The licensing deal with the leading tech company will generate SEK 10m in revenue over 2020 and at the beginning of 2021
- The licensing deal with Physik Instrumente will yield a total of SEK 8m split equally over 2020-2023

#### **Bear case**

In our bear case, we model that PiezoMotor still successfully launches Piezo LINK, but that volumes are lower. Piezo LEGS and Piezo WAVE are expected to show sales growth, reaching volumes corresponding approximately to the capacity of the current production facility.

#### **Key differences include:**

- Volumes for Piezo LEGS is slightly lower than our base case scenario, reaching around 11,000 units in 2023
- In the bear scenario, Piezo LINK volume ramps up slower than in the base case, reaching around 250,000 units in 2023
- Volumes of Piezo LINK reach 1.4m units in 2026
- Sales CAGR between 2020 and 2025 amounts to 25%
- EBIT-margin peaks at almost 20 % during the forecast period
- Long-term EBIT-margin is 16%

#### **Bull case**

We model a substantially stronger sales growth in our bull case. We expect that Piezo LINK is a commercial success, and PiezoMotor gains several high-volume customers within medtech or telecom. PiezoMotor also receives several larger orders for Piezo LEGS.

#### **Key differences include:**

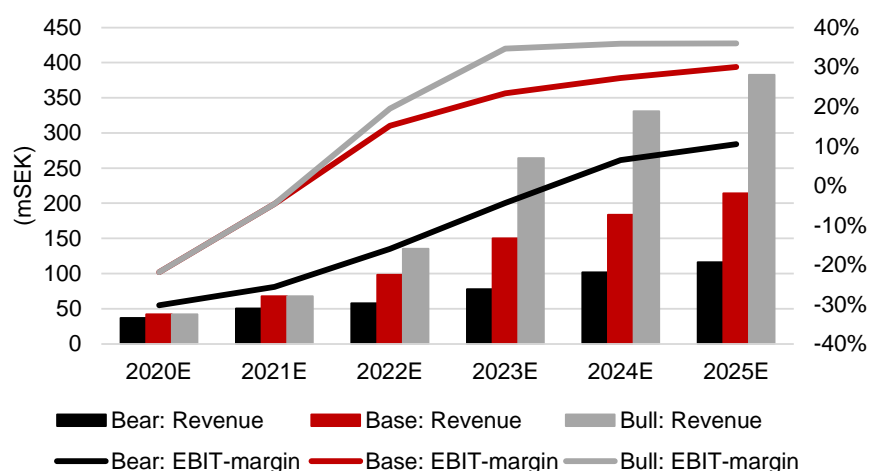
- Volumes for Piezo LEGS reach around 50,000 units in 2024
- Piezo LINK volumes surge quickly reaching 600,000 already in 2022
- Piezo LINK volumes reach maximum production capacity, i.e., 5m units, in 2025

- Hence sales CAGR in the bull scenario is 52% between 2020 and 2025
- EBIT-margin peaks at around 35% during the forecast period
- Long-term EBIT-margin is 28%

### Summary

Given the three scenarios outlined above, we have outlined the medium-term financial development in the chart below. We note that PiezoMotor's strong operating leverage yields a rapid margin expansion, even in the bear case where topline growth is relatively modest.

### PiezoMotor: Scenario comparison - revenue & EBIT-margin



Source: Redeye Research

In the table below, we summarize sales growth and EBIT-margin over the entire forecast period. When comparing the scenarios, we find that there are large differences, both in terms of sales CAGR and EBIT-margin over the forecast period. The bear case has slightly higher sales growth towards the end of the period since sales growth is lower in the short-term, and revenues are expected to materialize later in this scenario.

### PiezoMotor: DCF assumptions summary

	Sales CAGR		EBIT-margin		Terminal		WACC
	2020-2025	2026-2030	2020-2025	2026-2030	Sales growth	EBIT-margin	
Bear case	25%	10%	-10%	17%	2%	16%	11%
Base case	38%	7%	12%	29%	2%	25%	11%
Bull case	52%	7%	17%	34%	2%	28%	11%

Source: Redeye Research

Based on the assumptions outlined above, we find a base case from the DCF valuation of SEK 31 per share, and a valuation range of SEK 8 to SEK 62 per share. The details can be found in the table below. However, before concluding on the fair value range, we will apply a multiple valuation approach as well.

### PiezoMotor: DCF valuation summary

(mSEK)	Bear case	Base case	Bull case
NPV of FCF	28	223	488
NPV of terminal	74	212	392
EV	102	435	879
Net debt	-13	-13	-13
Equity value	115	448	893
Fair value per share (SEK)	8	31	62

Source: Redeye Research

## Multiple valuation

To verify our DCF valuation, we compare it to a multiple valuation. It is difficult to find perfect peers to PiezoMotor since there are no listed companies within the same industry. We have, therefore, chosen companies that are comparable to PiezoMotor from other industries.

We have selected a peer group based on that the companies have similar characteristics to PiezoMotor. i.e., that they are manufacturing, innovative companies that have acquired a strong position within their niche. We have also chosen companies that are mature, stable and profit-making. The peer group consists of Mycronic, Kongsberg Gruppen, HMS Networks, CTT Systems, Pricer, Sintercast and Hexatronic.

We find that the median EV/EBIT and EV/EBITDA multiples are around 27x and 22x, respectively, at the moment. For EV/EBIT, the 25<sup>th</sup> and 75<sup>th</sup> percentile are approximately 25x and 30x, whereas, for EV/EBITDA, they are 17x and 22x, respectively. We note that the median EBITDA-margin for the peer group is 23%, and hence it is in line with the EBITDA-margin that we believe that PiezoMotor will achieve.

<b>PiezoMotor: Peer table</b>			
<b>Peer</b>	<b>EV/EBIT</b>	<b>EV/EBITDA</b>	<b>EBITDA-margin</b>
Mycronic	13.6	14.0	30%
Kongsberg gruppen	26.9	14.0	11%
HMS Networks	30.4	22.2	23%
CTT Systems	23.3	22.1	34%
Pricer	24.4	17.7	14%
Sintercast	49.3	45.8	36%
Hexatronic	29.1	19.5	9%
Average	28.1	22.2	23%
<b>Median</b>	<b>26.9</b>	<b>19.5</b>	<b>23%</b>
25th percentile	23.8	15.8	12%
75th percentile	29.7	22.1	32%

Source: Bloomberg

Since PiezoMotor is currently loss-making, we use our 2025 EBIT and EBITDA forecast to find the 2025 EV. After discounting it back at our **11% WACC**, we find a fair value ranges based on both EV/EBIT and EV/EBITDA multiples. We use the 25<sup>th</sup> percentile, median, and 75<sup>th</sup> percentile multiples as the bear, base and bull case scenario multiples, respectively.

<b>PiezoMotor: EV/EBIT valuation</b>			
<b>(mSEK)</b>	<b>Bear case</b>	<b>Base case</b>	<b>Bull case</b>
EBIT 2025	12	64	138
Peer multiple	23.8	26.9	29.7
PiezoMotor EV 2025	292	1 731	4 098
Current EV	156	926	2 191
Equity value	169	939	2 204
Fair share value (SEK)	12	65	152

Source: Redeye Research & Bloomberg

The fair value based on an EV/EBIT multiple yields a value of SEK 65 per share in a base case scenario, with a fair value range of SEK 12 to 152 per share. If we instead look at EV/EBITDA, we find a base case valuation of SEK 51 per share and a range from SEK 11 to 120 per share.

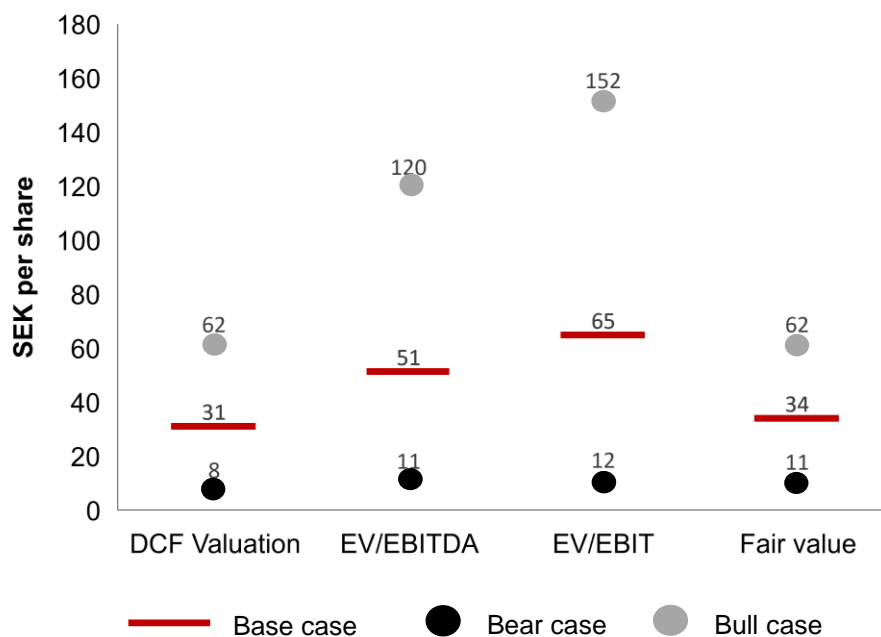
<b>PiezoMotor: EV/EBITDA valuation</b>			
<b>(mSEK)</b>	<b>Bear case</b>	<b>Base case</b>	<b>Bull case</b>
EBITDA 2025	18	70	146
Peer multiple	15.8	19.5	22.1
PiezoMotor EV 2025	285	1 363	3 230
Current EV	153	729	1 727
Equity value	166	742	1 740
Fair share value (SEK)	11	51	120

Source: Redeye Research & Bloomberg

### Valuation summary

To conclude, we will summarize our different valuation approaches. The different fair ranges from the DCF valuation and multiple valuation are presented in the chart below. The fair value ranges for the multiples lie quite a bit higher compared to the DCF valuation. Hence, we conclude that the DCF is slightly conservative. We set a fair value at SEK 34 per share in a base case scenario and the fair value range at SEK 11 to SEK 62 per share.

### PiezoMotor: Summary fair value ranges



Source: Redeye Research



## Bear Case 11 SEK

In the bear case, we assume that Piezo LINK is launched, but that it reaches limited commercial success. We also assume that PiezoMotor receives a slightly larger order for Piezo LEGS going forward. This results in some operating leverage when sales increase.

Other assumptions include:

- Sales CAGR of 25% between 2020 and 2025
- Significantly raised prices from 2020 and onwards
- Piezo LINK volumes reach 1.4m in 2026
- Piezo LEGS volumes reach 11,000 units in 2023
- Total sales are around SEK 180m at the end of the forecast period
- EBIT-margin over the forecast period peaks at almost 20%
- Long-term EBIT is 16%
- Break-even is reached in 2024

## Base Case 34 SEK

In our base case, we model that Piezo LINK volumes are ramped up quickly. PiezoMotor also receives one or two larger orders for Piezo LEGS in 2021-2022. The sales growth generates substantial operating leverage, reaching break-even in 2022.

Other assumptions include:

- Sales CAGR of 38% from 2020 to 2025
- Significantly raised prices from 2020 and onwards
- Volumes of Piezo LINK reaches 2.5m units in 2026
- Volumes of Piezo LEGS amounts to 15,000 in 2023
- Total sales are around SEK 300m at the end of the forecast period
- EBIT-margin peaks at 30%
- Long-term EBIT-margin is 25%

## Bull Case 62 SEK

The bull case scenario is based on that Piezo LINK becomes a great success and that volumes increase up to the maximum of planned capacity. Also, the rest of the business takes off, and several larger customers place orders of high volume.

Other assumptions include:

- Sales CAGR of 52% from 2020 to 2025
- Significantly raised prices from 2020 and onwards
- Piezo LINK volumes reach 5m units in 2025
- Piezo LEGS volumes amount to 50,000 units in 2024
- Total sales are more than SEK 530m at the end of the forecast period
- EBIT-margins peak around 35%
- Long-term EBIT-margin is 28%
- Break-even is reached in 2022

## Summary Redeye Rating

The rating consists of three valuation keys, each constituting an overall assessment of several factors that are rated on a scale of 0 to 1 points. The maximum score for a valuation key is 5 points.

### Rating changes in the report

#### People: 4

Although PiezoMotor's CEO is rather recently appointed, and therefore not very experienced within the field, the rest of management can boast long industry experience. The company also has a strong ownership structure, with large long-term shareholders such as the co-founder of the company, Adam Dahlberg, and representatives from the industrial investor, Faulhaber. We think that the company is well-governed and that the management communicates in a straight-forward and honest way. However, the lack of shares held by the management is a weak point, and Anders Kottenauer has less than one year in office, making it difficult to evaluate him as CEO at this point.

#### Business: 4

PiezoMotor is focusing on a small niche market, where it has built up a strong position. It has already established a rather wide customer base, with around 100 paying customers. Although it has one or two serious competitors, we believe that the company has a bright future ahead of it. This is confirmed by the strong traction in terms of sales growth that PiezoMotor has experienced over the last few years. Growth prospects for the overall micro motor market are really good, and the company is in an excellent position to gain market share, both in the high-end and with the new Piezo LINK, also in the mass market.

#### Financials: 2

Since PiezoMotor up until now has been a loss-making company with negative cashflows, it scores low in the financials section. Although the company has had significant sales growth over the last few years and has a solid balance sheet, we expect that it will need additional capital injections before reaching break-even in 2022.

INCOME STATEMENT	2018	2019	2020E	2021E	2022E
Net sales	26	31	42	68	98
Total operating costs	-46	-43	-50	-66	-78
EBITDA	-20	-12	-8	2	21
Depreciation	0	0	0	-2	-3
Amortization	-1	-1	-1	-3	-3
Impairment charges	0	0	0	0	0
EBIT	-21	-13	-9	-3	15
Share in profits	0	0	0	0	0
Net financial items	0	0	0	0	0
Exchange rate dif.	0	0	0	0	0
Pre-tax profit	-21	-13	-9	-3	14
Tax	0	0	0	0	0
Net earnings	-21	-13	-9	-3	14

BALANCE SHEET	2018	2019	2020E	2021E	2022E
<b>Assets</b>					
<i>Current assets</i>					
Cash in banks	54	17	4	7	10
Receivables	8	11	13	17	20
Inventories	10	12	13	17	20
Other current assets	2	3	3	3	3
Current assets	74	44	33	44	52
<i>Fixed assets</i>					
Tangible assets	2	5	8	9	11
Associated comp.	0	0	0	0	0
Investments	0	0	0	0	0
Goodwill	0	0	0	0	0
Cap. exp. for dev.	0	0	0	0	0
0 intangible rights	4	10	14	14	13
0 non-current assets	0	0	0	0	0
Total fixed assets	6	14	22	23	24
Deferred tax assets	1	1	1	1	1
Total (assets)	80	59	55	68	77
<b>Liabilities</b>					
<i>Current liabilities</i>					
Short-term debt	2	2	2	9	4
Accounts payable	11	7	13	17	20
0 current liabilities	1	1	1	1	1
Current liabilities	14	10	15	26	24
Long-term debt	4	1	1	7	3
0 long-term liabilities	0	0	0	0	0
Convertibles	0	0	0	0	0
Total Liabilities	17	11	16	33	27
Deferred tax liab	0	0	0	0	0
Provisions	0	0	0	0	0
Shareholders' equity	63	48	39	35	50
Minority interest (BS)	0	0	0	0	0
Minority & equity	63	48	39	35	50
Total liab & SE	80	59	55	68	77

FREE CASH FLOW	2018	2019	2020E	2021E	2022E
Net sales	26	31	42	68	98
Total operating costs	-46	-43	-50	-66	-78
Depreciations total	-1	-1	-1	-5	-6
EBIT	-21	-13	-9	-3	15
Taxes on EBIT	0	0	0	0	0
NOPLAT	-21	-13	-9	-3	15
Depreciation	1	1	1	5	6
Gross cash flow	-20	-12	-8	2	21
Change in WC	-4	-11	4	-4	-3
Gross CAPEX	-3	-9	-8	-7	-6
Free cash flow	-26	-32	-12	-9	12

CAPITAL STRUCTURE	2018	2019	2020E	2021E	2022E
Equity ratio	78%	81%	70%	52%	65%
Debt/equity ratio	9%	7%	7%	43%	14%
Net debt	-48	-13	-1	8	-3
Capital employed	15	34	37	44	47
Capital turnover rate	0.3	0.5	0.8	1.0	1.3

GROWTH	2018	2019	2020E	2021E	2022E
Sales growth	4%	18%	37%	61%	45%
EPS growth (adj)	14%	-38%	-29%	-62%	-518%

DCF VALUATION		CASH FLOW, MSEK	
WACC (%)	12.0 %	NPV FCF (2019-2020)	-10
		NPV FCF (2021-2027)	185
		NPV FCF (2028-)	205
		Non-operating assets	17
		Interest-bearing debt	-3
		Fair value estimate MSEK	393
Assumptions 2017-2023 (%)			
Average sales growth	32.7 %	Fair value e. per share, SEK	27.1
EBIT margin	14.2 %	Share price, SEK	35.6

PROFITABILITY	2018	2019	2020E	2021E	2022E
RDE	-58%	-23%	-21%	-9%	34%
ROCE	-49%	-21%	-20%	-7%	28%
ROIC	-218%	-86%	-27%	-8%	34%
EBITDA margin	-77%	-39%	-20%	3%	21%
EBIT margin	-80%	-42%	-22%	-5%	15%
Net margin	-81%	-42%	-22%	-5%	15%

DATA PER SHARE	2018	2019	2020E	2021E	2022E
EPS	-1.46	-0.90	-0.64	-0.24	1.00
EPS adj	-1.46	-0.90	-0.64	-0.24	1.00
Dividend	0.00	0.00	0.00	0.00	0.00
Net debt	-3.32	-0.93	-0.09	0.58	-0.21
Total shares	14.47	14.47	14.47	14.47	14.47

VALUATION	2018	2019	2020E	2021E	2022E
EV	622.0	514.8	513.9	523.6	512.2
P/E	-31.8	-40.7	-56.0	-148.8	35.6
P/E diluted	-31.8	-40.7	-56.0	-148.8	35.6
P/Sales	25.8	17.2	12.3	7.6	5.3
EV/Sales	24.0	16.8	12.2	7.7	5.2
EV/EBITDA	-31.0	-42.8	-61.2	265.8	25.0
EV/EBIT	-29.9	-40.1	-55.9	-168.9	34.4
P/BV	10.6	11.1	13.4	14.7	10.4

SHARE PERFORMANCE	GROWTH/YEAR		16/18E
1 month	5.0 %	Net sales	27.2 %
3 month	-2.2 %	Operating profit adj	-33.5 %
12 month	-20.9 %	EPS, just	-33.9 %
Since start of the year	-4.6 %	Equity	-21.7 %

SHAREHOLDER STRUCTURE %	CAPITAL	VOTES
Adam Dahlberg	19.7 %	19.7 %
Dr. Fritz Faulhaber GmbH & Co.KG	15.8 %	15.8 %
Lle Gaudium Ivst	15.8 %	15.8 %
Handelsbanken Fonder	8.5 %	8.5 %
Swedbank Robur Fonder	7.8 %	7.8 %
LMK-bolagen & Stiftelse	4.9 %	4.9 %
Avanza Pension	2.7 %	2.7 %
Gunvald Berger	1.9 %	1.9 %
Tibia Konsult AB	1.4 %	1.4 %
Crossbow AB	1.3 %	1.3 %

SHARE INFORMATION	
Reuters code	
List	First North
Share price	35.6
Total shares, million	14.5
Market Cap, MSEK	515.2

MANAGEMENT & BOARD	
CEO	Anders Kottenauer
CFO	Olof Stranding
IR	
Chairman	Adam Dahlberg

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## Redeye Rating and Background Definitions

### Company Quality

Company Quality is based on a set of quality checks across three categories; PEOPLE, BUSINESS, FINANCE. These are the building blocks that enable a company to deliver sustained operational outperformance and attractive long-term earnings growth.

Each category is grouped into multiple sub-categories assessed by five checks. These are based on widely accepted and tested investment criteria and used by demonstrably successful investors and investment firms. Each sub-category may also include a complementary check that provides additional information to assist with investment decision-making.

If a check is successful, it is assigned a score of one point; the total successful checks are added to give a score for each sub-category. The overall score for a category is the average of all sub-category scores, based on a scale that ranges from 0 to 5 rounded up to the nearest whole number. The overall score for each category is then used to generate the size of the bar in the Company Quality graphic.

### People

At the end of the day, people drive profits. Not numbers. Understanding the motivations of people behind a business is a significant part of understanding the long-term drive of the company. It all comes down to doing business with people you trust, or at least avoiding dealing with people of questionable character.

The People rating is based on quantitative scores in seven categories:

- Passion, Execution, Capital Allocation, Communication, Compensation, Ownership, and Board.

### Business

If you don't understand the competitive environment and don't have a clear sense of how the business will engage customers, create value and consistently deliver that value at a profit, you won't succeed as an investor. Knowing the business model inside out will provide you some level of certainty and reduce the risk when you buy a stock.

The Business rating is based on quantitative scores grouped into five sub-categories:

- Business Scalability, Market Structure, Value Proposition, Economic Moat, and Operational Risks.

### Financials

Investing is part art, part science. Financial ratios make up most of the science. Ratios are used to evaluate the financial soundness of a business. Also, these ratios are key factors that will impact a company's financial performance and valuation. However, you only need a few to determine whether a company is financially strong or weak.

The Financial rating is based on quantitative scores that are grouped into five separate categories:

- Earnings Power, Profit Margin, Growth Rate, Financial Health, and Earnings Quality.

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### Redeye Rating (2020-02-16)

Rating	People	Business	Financials
5p	12	12	4
3p - 4p	93	72	27
0p - 2p	9	30	83
Company N	114	114	114

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### CONFLICT OF INTERESTS

Erika Madebrink owns shares in the company : No

Henrik Alveskog owns shares in the company : No

Redeye performs/have performed services for the Company and receives/have received compensation from the Company in connection with this.