

Invitation to subscribe shares in Stirlingversal AB (publ)

PRIVATE PLACEMENT

March 1, 2023

## TABLE OF CONTENTS

Important information regarding the Memorandum	3
Terms & conditions	4
Selected risk factors	6
Stirlingversal in summary	8
Background and motive	10
Message from the CEO	12
Stirlingversal AB (publ)	13
Renewable energy – from waste to value	16
Market overview	18
Organization	20
Shareholder & ownership	22
Financial information	23
Article of association	24
Contact information	26

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### OFFER IN BRIEF

SUBSCRIPTION TIME	MARCH 1, 2023 – MARCH 31 2023
SUBSCRIPTION LOT	46 720 SEK (1 460 SHARES PER LOT)
SUBSCRIPTION PRICE	32 SEK
ISSUE VALUE	7 008 000 SEK
ISSUE VOLUME	219 000 SHARES
NUMBER OF SHARES (PRE-ISSUE)	948 477 SHARES
VALUATION (PRE-MONEY)	30 351 264 SEK

## IMPORTANT INFORMATION REGARDING THE MEMORANDUM

### Definitions

Throughout this Memorandum the following definitions apply, unless otherwise expressly stated. The "Company" or "Stirlingversal" refers to Stirlingversal AB (publ) with corporate registration number 559096-2105. Cofunding Group refers to Cofunding Group K/S with corporate registration number 25150260 and "Recipient" is the recipient of this Memorandum.

### Preparation of this Memorandum

This Memorandum has been produced by the management of Stirlingversal AB (publ). Cofunding Group K/S has assisted the Company in the compilation of this Memorandum. The Board of Directors are responsible for the content of the Memorandum. Cofunding Group is in no way responsible for the content of this Memorandum. Cofunding Group is not responsible for any future investments in the Company.

### Exposure of this Memorandum

The purpose of the Memorandum is to assist in the valuation of a potential investment in the Company. The recipient of this Memorandum is encouraged to use it exclusively for this purpose.

### Exemption from the Prospectus requirement

The Memorandum is exempt from the law regarding trading with financial instruments requiring a Prospectus in accordance with the European parliaments and the European council regulations 2017/1129 ("Prospectus Regulation"). The issue is exempt from the Prospectus regulation in accordance to law (2019:414) with supplementary regulations to the EU prospectus regulation. The offer is a Private Placement for institutional and professional investors and is exempt from registration with the Swedish FSA. This Memorandum has not been examined, nor approved, by the Finansinspektionen (the Swedish FSA).

### Dissemination of the Memorandum

This Memorandum is aimed at investors who do not need further prospectuses or other arrangements as

per Swedish law. This Memorandum may not be disseminated in Australia, Japan, Canada, New Zealand, USA, and South Africa or any other country where further requirements must be met. In regards to this Memorandum, Swedish law applies and any dispute shall be settled in a Swedish Court. The Recipient of this Memorandum is encouraged to perform his, or her, own due diligence of the Company. This should also include consultation with professional advisors about the legal, financial, tax and other potential consequences that may arise through an investment in the Company.

### Statements about the future

Statements in this memorandum concerning the future, or future events in all regards, reflects the board of directors' current view of the future. The Recipient should realize that these projections are based on the facts as they were at the time of the writing of this memorandum. These projections are based on the best available information, but are as always associated with a level of uncertainty.

### Tax

According to the laws of the country of which you are a resident.

### Obtaining the Memorandum

The Memorandum can be obtained from the Company or Cofunding Group. Contact information is to be found under section "Terms & Conditions" or "Contact Information".

### The Board Assures

The Board hereby assures that all reasonable precautions have been taken, as far as the Board is aware, to ensure that all the information in the memorandum complies with the facts and that no relevant information has been left out. Furthermore, the Board assures that all information from external sources has been reproduced in a correct manner.

Lund February 28, 2022

*The Board of Stirlingversal AB (publ)*

## TERMS & CONDITIONS

### Decision regarding the issue

Based on the authorization from the extra general meeting October 20, 2022 the Board decided February 23, 2023 to increase the Company's share capital by a maximum of 238 181 SEK through the issue of a maximum of 219 000 shares. The offer is addressed to institutional and professional investors.

### Subscription amount

The subscription price is 32 SEK per share. No commission is charged.

### Number of lots

The offer includes a maximum 150 lots to a maximum of 149 investors.

### Lot size

Shares are subscribed in whole lots. One (1) lot is an offer to subscribe to 1 460 shares at 32 SEK per share for a total value of 46 720 SEK per lot.

### Subscription period

Subscription of shares will take place during the period: March 1, 2023 – March 31, 2023. The Board in the Company is mandated to extend the subscription period at their discretion.

### Investors

Individuals of the general public as well as institutional investors are entitled to subscribe to the issue.

### Foreign investors

Investors residing outside Sweden (not referring to investors living in USA, Canada, New Zealand, Australia, South Africa or Japan, Hong Kong) and who are eligible to subscribe to the issue may contact the Company or Cofunding Group. Contact information can be found below. The above-mentioned companies will assist with information concerning subscription and payment.

### Preferential rights

The subscription will be implemented without preferential rights for existing shareholders. However existing shareholder can participate. The

shareholders' converted a bond issue of 3 320 780 SEK for 148 249 new shares previous to this issue.

### Valuation

The Company's valuation is 30 MSEK (pre-money).

### Subscription

The acceptance period stretches from March 1, 2023 – March 31, 2023. Subscription is done by sending the correct and complete filled-in application form to Stirlingversal by mail or scanned via e-mail.

Completed application form shall be at Stirlingversal no later than March 31, 2023. There is no possibility to reduce the number of shares on the subscription form. Only one subscription form can be submitted per person. If more than one subscription form is submitted the last submitted subscription form will be considered. In the event of late submission of a subscription form, as well as incomplete subscription form, the subscription form can be disregarded; No modifications or additions may be made in the pre-printed text.

*The subscription application is binding and cannot be retracted.*

### Subscription forms

Subscription forms may be obtained through contacting:

Stirlingversal AB (publ)  
Scheelevägen 17  
223 63 Lund, Sweden  
Phone: +46 708 437090  
Lars.Larsson@stirlingversal.com

Cofunding Group  
Kronprinsessegade 46 E  
1306 Copenhagen K, Denmark  
Phone: +45 60137786  
info@cofundinggroup.com

### Allocation of subscription

The allocation of subscription is taken by the board of directors after which the investors will be notified

of any allocation by a contract note by e-mail. The investors who have not received allocation will not be notified. The Board of Directors' allocation decision may differ from the notifications in respect of distribution. Assignment is not guaranteed but may be absent or occur with a lower number of items other than the notification is submitted. Subscription of shares is without preferential rights for existing shareholders. The objective will be to achieve a wide spread of shares among the public.

#### **Payment**

The shares shall be paid in cash at the latest three (3) bank business days after dispatch of the bill showing the notification of allocation of shares. The Board of Directors has the right to extend the time for payment. If the shares are not paid in cash at the right time, the shares may be transferred to others. Would the selling price for such transfers be lower

than the price in the offer, the person(s) that originally received the shares will have to answer for the whole or part of the difference.

#### **Delivery of shares**

Delivery of shares will take place as soon as the share issue has been registered with Bolagsverket (the Swedish companies registration office), which is scheduled for week 15 of 2022.

#### **Shareholders register**

Stirlingversal's shareholder register is held by Nordiska Värdepappersregistret.

#### **Miscellaneous**

All shares in this issue are newly issued. This means that no physical or legal person will be selling any shares in conjunction with this offer.

## SELECTED RISK FACTORS

### Introduction

Business activities and investing in shares is always associated with risk and Stirlingversal AB (publ) is no exception to this rule. A number of factors outside the control of the Company can have an impact on its result and financial position, as well as many factors which the Company is able to influence through its actions. In addition to the information contained in this Memorandum, every potential investor should make his/her own assessment of each risk factor and what it may mean for the future potential of the Company. This review highlights the most obvious risks facing the Company. The assessment below does not claim to be complete.

### Financial risk

The Company is a scale-up company and there is thus a risk that the Company's resources are insufficient and that the Company will need to add additional capital over time. It cannot be excluded that it may take longer than expected to achieve continuous and stable earnings.

### Currency risk

Stirlingversal acts globally both regarding suppliers/subcontractors, customers and operations therefore, Stirlingversal is exposed to currency risks. To mitigate those risks different measures are taken such as; Maximizing the use of one currency only in all contracts i.e. euro. Where possible indexing monetary values related to applicable currencies. For large commitments consider the use of adequate currency basket. Allocating bank accounts designated to specific currencies i.e. SEK, EUR, USD, RMB.

### Supplier risk

The company sources globally, mainly relying on an efficient and low-cost industrial supply chain in China. This carries a risk of component delivery delays due to supplier technical and quality instability as well as the current Covid situation in China. However, our team in China is there to manage and mitigate this risk.

Procurement outside of China is mainly concentrated in Europe and the United States. Based on the global supply chain situation, component supply shortages due to lack of raw material and price fluctuations is considered the main risk here during the next few years.

### Liquidity risk

Stirlingversal is a small company with limited cash equivalents. The planned emission ensures liquidity for the Company's needs in the near future. The risk of lacking cash in new companies is always somewhat existent for scale-ups. The likelihood that the Company would have difficulty in fulfilling its payment commitments may occur if financing and expansion do not follow each other carefully. The Company and its management carefully follow the development of costs and revenues as well as the financing plan to avoid and eliminate this risk as far as possible.

### Competitive risk

There are comparable competitors within the Company's business area. There is a risk that there will be more players in the market in the future, as the Company's niche industry is on the rise and that there are financially strong players in the industry. In the short and medium term, this is a relatively small risk. At the same time, the market is growing and is large, which makes room for more companies. Due to an exclusivity agreement, our partner can only use our Stirling technology on the huge market in China for the jointly developed hot flue gas solution.

### Political risk – legislation

The Company's operations are in green energy which is the focus point of most governments within the EU. The Company estimates that there are currently no political risks associated with the Company's operations. However, business activities in China may be affected due to strained relations between China and Europe. In that context, it should be noted that the manufacturing activities (assembling av Stirling engine units) in China are structured such that those activities can be

transferred to other regions (e.g. Europe, US) with limited efforts.

Globally, the war in Ukraina has a negative effect on delivery of materials containing high level of nickel and chromium, which also has a negative effect on Stirlingversal. However, subject war also has a positive effect on the demand for our type of energy solutions.

#### **Key personnel risk**

Stirlingversal has a smaller number of key personnel who, with their knowledge and broad competence, have positioned the company and acted and secured its partner agreement. Through ownership, these key individuals are given the opportunity to continue to promote good development and financial gain within the Company, and thereby have incentive to stay on. In scaling up the company, the need for recruitment is obvious. The location of Stirlingversal and its wholly owned subsidiary in China has been carefully selected to areas with readily access to skilled resources well suited for our business applications. This is further strengthened by collaborations with external strategic partners also operating close to our facilities.

#### **Operational risk**

The risk of harm incurred by internal and external inadequate routines is minimized by using the best external service and security service providers.

Internal and external procedures, legal requirements, regulations etc. To minimize any risk of harm within the organization, applicable

directives, regulations, quality standards and processes will be used to provide a safe way of company functions and operations.

#### **Technical risk**

Stirlingversal specializes in renewable energy production plants, which entails technical risks for systems. The technical risk for the key product, the stirling engine, is considered to be relatively low as variations of this engine design over long time has gained substantial operational experience from a variety of applications. The main challenge is the integration of other systems, which in some instances Stirlingversal may not have the same control as for the core product. Other technical risks may be related to the introduction of new components suppliers related to further cost reduction measures when entering volume production.

#### **Liability risk**

The Company has proper indemnity insurance through the insurance company If (liability insurance).

#### **Risks concerning achieving sufficient sales**

It cannot be established with certainty that the Company's services and related products receive the market penetration as reflected in this Memorandum. Sales may be lower and market opening may take longer than the Company today has reason to expect.

#### **Litigations**

The Company has at this moment no legal disputes.

## STIRLINGVERSAL IN SUMMARY

### **Greentech company**

Stirlingversal, a Swedish privately own company, seeks to become a key player on the global market for environmentally friendly energy systems by using cutting-edge technology. Stirlingversal develops, manufactures, and sells robust distributed and dispatchable energy systems using advanced Stirling engine technology. The Stirling engine is a heat engine capable of converting heat from an external heat source to electrical power. By utilizing the Stirling technology, Stirlingversal provides options for sustainable clean local energy generation with primarily renewable energy sources such as various types of bioenergy and by utilizing waste-to-energy resources.

By limiting transportation and generating energy from local bio-energy and waste Stirlingversal's customers can rely on the system to provide on-demand, reliable energy that is also environmentally friendly. Stirlingversal's waste-to-energy (W2E) systems are simple to distribute, install, operate, maintain, and use the unique state-of-the-art Stirling engine. These engines have been specifically engineered for low-maintenance cost, high re-liability, and long service life. The systems are constructed on a modular platform that enables cost-effective and flexible customization ranging from 30 kW up to 1 MW plant size.

Proceeds will also be used for business development for additional applications as well as for measures for further product cost reduction.

### **Use of issue proceeds**

The funding from the issue is to raise beneficial working capital, to continue the next phase of Stirlingversal growth plan. Stirlingversal also wishes to broaden its shareholders base with long-term investment partners who can support the next phase of the Company's growth journey.

Phase 1 focuses on development and commercialization of Stirling technology power units for W2E applications and with the intention to obtain a positive cash flow within 2023. The longer-term phase 2 will enlarge the application base for the Stirling technology with modular power conversion units for the conversion of heat generated from renewable fuels ranging from bio-gases and liquid fuels of various origins to bio-mass.

### **Orders**

During 2021, the first commercial order for the Hot Flu solution was signed with Stirlingversal's partner in China. The contract's validity is dependent upon 2 – 3 weeks of tests at Stirlingversal's facility proving the sufficient efficiency for the client's requirements. It will then require 2 to 3 weeks of final testing in China before final approval and fulfilment of order.

The first batch of delivery to our partner in China is planned to occur during Q2 2023.

### **Vision & Objectives**

Stirlingversal's mission as a Greentech company is to develop first class environmentally sustainable, on-demand energy solutions close to the customers/consumers.



## **Vision**

- Stirlingversal's vision is to further the global transformation towards a climate friendly and sustainable world. Stirlingversal's business idea supports this vision by offering the development, manufacturing, and provision of reliable, cost-efficient, distributional and dispatchable energy systems all based on state-of-the-art Stirling engine technology.
- Enable reduced dependencies on large power grid solutions in times of crisis and at the same time support rapid development of new improved and cost-effective energy systems.

## **Objectives**

- To customize Stirling engines for many different applications in order to help different kinds of players and people
- To generate outputs (electricity, heat, bio-char) that help different kinds of players and people and can be used to reduce the use of fossil fuel in creating many kinds of products and services
- To become a key player on the global market for environmentally friendly small, scalable energy systems

## BACKGROUND & MOTIVE

### Background

Producing renewable energy and managing waste with zero emission is one of the most prioritized topics globally. Innovative technologies process non-recyclable waste and make sure it is safely managed and used as a resource. Modern-day waste-to-energy plants are well integrated with their surroundings and involved in the process of non-recyclable waste produced by households and industries. Apart from waste management, the plants also generate electricity and heating, providing an affordable, reliable source of energy to local communities. According to the Renewable Energy Directive and the Green Deal every renewable energy source available has a critical role to play to enhance the efforts of the EU economy towards decarbonization and a circular economy, what cannot be recycled can become energy, contributes towards the achievement of zero landfills in Europe as well as serve as a basis for other products. Similar directives and policies are required outside the EU throughout the globe including China.

Stirlingversal's waste-to-energy systems are simple to distribute, install, operate, maintain, and use the unique state-of-the-art Stirling engine. These engines have been specifically engineered for low-maintenance cost, high reliability, and long service life. The systems are constructed on a modular platform that enables cost-effective and flexible customization ranging from 30 kW up to 1 MW plant size. By limiting transportation and generating energy from local waste, Stirlingversal's customers can rely on the system to provide on-demand, reliable energy that is also environmentally friendly.

### Motive

Capital is needed to scale up production to meet current and expected orders and to build-up the technical organization as well as a sales and marketing organization and/or network with partners in Sweden and China.

The technical organization having a solid general key competence within the stirling engine development, combustion technology and manufacturing area.

Establishment of a sales and marketing organization as well as a service and aftermarket organization. Resources for finance control and accounting must also be hired within the near future to ensure efficient control of company and project economics.

### The Stirlingversal Team

Most of the founders and main owners of Stirlingversal are active within the company - with operational management, on the company's board or in general advisory roles giving support to the company. The founders all have extensive industrial experience in different disciplines and from different business segments. The team also has broad experience from relevant international assignments and has acquired valuable cultural and linguistic knowledge from many countries including China after years of overseas relocations. In terms of stirling technology, the company has a unique world-leading position with team members who have previously been active and have extensive experience not only from Kockums' original world-leading stirling technology for military submarines, but also from development activities with stirling technology in the US, China and Sweden.

## Financial needs

Financial needs of 2023 are based on:

- That engine delivers on the agreed performance, in a so-called Acceptance Test (AT) set between the Chinese customer and Stirlingversal;
- Acceptance test is positive during Q2 '23 and contract signed in connection to the AT;
- The basis for this contract is agreed with the customer in terms of pricing, delivery plan and payment terms;
- Projected sales (see below)
- COGS and Swedish operations are based on actuals (ex. material prices, production efficiency, lead time).
- No income tax payments are projected before 2025 as Stirlingversal have accumulated tax losses that could be utilized against future earnings.

## Valuation

The pre-money valuation for Stirlingversal is 30 MSEK. This valuation is based on:

- Current order to partner in China
- Projected financials (see below)
- A committed team with all its competence and capabilities to drive the Company forward
- An outstanding core product, the Stirling engine in terms of performance, flexibility, cost and reliability
- Huge potential for lucrative and growing market segments driven by global energy crisis and to achieve global climate goals

## MESSAGE FROM THE CEO

Dear Stirling Engine Friends,

Rarely have we been hit by so many challenges that have simultaneously and negatively affected the living conditions of individuals and the conditions for business and society in general. Pandemic, Russia's terror war, energy capacity shortages, rampant electricity, fuel and food costs, inflation, lack of industrial components and global logistics problems. The list can be made long and of course our company is also affected. Due to the pandemic and our operations in China, we have been particularly exposed. Periodic extensive shutdowns of factories, cities and regions in China have affected our own operations and our supply chain. All in all, this has affected our business negatively with, among other things, project delays as a result.

Despite all the challenges, a lot of positive things have happened with our company and our business. After initial delays and quality deficiencies with components, we now have a highly functioning supply chain. Our company in China has started production and assembled the first Chinese-made Stirling engines. Stirling engines have been delivered to Sweden for verification of quality and functionality and for application testing. To get around the problem with the supply of electronic components, together with partners we have developed a new, very potent and innovative engine control system that has many ingenious functions. Through standardization, modularity and flexible design concepts, our new control system will be significantly less vulnerable in the future, for example due to shortage of electronic components. We are now prioritizing and working intensively to be able to deliver our first contracted Stirling engines for Waste to Energy (W2E) applications to our customer in China this spring. A first test engine is already installed in the customer's W2E facility in China. We see a very large market for various applications for the Stirling engine technology in the W2E segment and we are confident that the company's first contract will be a success. There are also other potential customers within this market segment and in addition there are several other possible applications for our Stirling engines that we will evaluate further down the road. Worth of mention in this context are combustion solutions with our unique combustion system for various types of gaseous and liquid fuels and, in the long term, also pyrolysis systems for the generation of combustible gas and biochar from solid fuels. In addition, there is a potential to use our Stirling engine technology in various segments with energy storage and for efficient recovery of high-value heat from the process industry that will otherwise just be wasted.

We are now carrying out a comprehensive restructuring of the company where we are reviewing our operations and how we can best prioritize in short-term and longer-term. The type of business we conduct is capital intensive. Capital is needed for personnel in various disciplines, for premises, for materials, components and tools as well as for conducting development and testing of products and various applications. In this regard I would like to highlight that the company policy and our firm ambition is to always work cost-effectively in every way and that our cost level indeed is successfully low in comparison with other similar businesses. In terms of restructuring and capital acquisition, intensive work is underway on several levels. Our business requires a certain "minimum critical mass" to remain operational and more capital is needed to secure the business. With this memorandum we are addressing existing and potentially new shareholders with information to bring in more capital for the company. This is fundamentally important for us to be able to drive our business forward in an efficient manner. Highest priority will be to use the capital on verification and commercialization of Stirling technology power units for W2E applications and with the intention to obtain a positive cash flow within 2023.

*Lars Larsson*

CEO, Stirlingversal AB (publ)

## STIRLINGVERSAL AB (PUBL)

Stirlingversal is a privately-owned scale-up green tech company with a proprietary Stirling Engine Technology set to revolutionize the bio-energy and waste-to-energy markets on a global scale. The Stirling Engine Technology reduces the need for complex and expensive raw-gas cleaning & treatment mid-systems to enable the utilization of "dirty" fuels. This creates a highly efficient, environmentally friendly energy system with emissions close to zero.

### Company Milestones

- 2017: Stirlingversal was founded in 2017. Originally the idea was to establish a partnership with a Chinese company to further promote the development and sales of the Stirling engine technology for concentrated Solar Power and other applications.
- 2018: The cooperation/partnership with the Chinese company starts
- 2019: Stirlingversal acquires assets related to Stirling CSP from Chinese company
- 2019: Company office at Ideon Science Center in Lund and establishment of facilities for testing of Stirling engines nearby Lund
- 2019: Stirlingversal acquires a License from Saab Kockums for the Stirling engine technology
- 2019: Establishment of fully owned production facilities in Kunshan and build-up of supply-chain primarily from world leading automotive component suppliers
- 2019: Introduction of a flexible hybrid (gas and solar) combustion system
- 2020: Initial testing of the unique combustion system
- 2021: Development of novel control and monitoring system
- 2021: First commercial contract signed for W2E application to a Chinese customer/partner
- 2022: Application testing of gasifier for generation of pyrolysis gas from biomass to be used as fuel in the Stirling engine
- 2022: First engine delivered to customer in China for testing of W2E application
- 2022: First batch of China built engines delivered to Sweden for testing and verification
- 2022: Testing of latest engine design starts in Sweden

### Collaborations

The products and systems are designed and developed in Sweden, in collaboration with other leading enterprises and academic institutions. This includes the key technology areas combustion, heat transfer, optimization of fuel conditions and control and monitoring systems.

Stirlingversal largely assembles their products in Kunshan, China, where the Company operates a wholly owned subsidiary. Vital components and systems critical from an IP and/or quality perspective are secured by development and production in-house or in close cooperation with partners in Sweden.

### Supply chain

Stirlingversal has established partnerships with experienced suppliers, from primarily China and Sweden. In the execution of the products, the supplier maintains daily technical, project and business communication with both the Chinese team and the Swedish team. Within the production site the staff are designated to production, quality control and supervision. For fully controlling production processes and managing delivery delays, Stirlingversal implements the deviation request/approval process in production to manage quality issues with the suppliers. After the products are delivered, a strict Incoming Goods Quality Control (IQC) is implemented, and the results are fed back to the supplier in time, and they are required to propose improvement measures for deviations and be approved by the Swedish team.

### **Group company**

The company has two wholly owned subsidiaries one in China and one in Greece. The plan is to wind up the company in Greece. Stirlingversal in China is located in Kunshan, Jiangsu Province. (20 min by train from Shanghai) due to:

- Readily access to qualified staff suitable for our kind of business
- World class supply chain for the automotive industry
- Mainland China has a huge market potential for our products

The location in Kunshan gives us strong logistical benefits and easy access to qualified staff. Given that Kunshan has a long tradition of foreign companies, the Import and export of parts and finished products is efficient. Many of our component suppliers are also located in the same area as well as future customers. The central government's focus on renewable energy gives us support locally from the Kunshan municipality and the Province of Jiangsu. There are now big renewable energy projects to which we are being invited.

The contacts and cooperation with local players now established in China by our Kunshan team will secure future positive development for us.

### **Go to market and initial focus on Hot Flue Gas applications**

2021, a contract was signed with our partner in China for a specific Waste to Energy solution, designated "Hot Flue Gas solution". Subject system has been developed jointly together with our partner. This application will be Stirlingversal's initial focus to deliver distributed dispatchable systems generating both electricity and heat, thus enabling us to penetrate the huge market potential in China together with our local partner. In parallel with subject cooperation partner, Stirlingversal is also in discussions with a Chinese technology developer and provider that provides environmentally friendly solutions to handle waste from the production processes of the steel, electric power and chemical industry. Their customers generate huge amounts of hot gases that are currently burnt off and we see a big potential in using those gases as energy sources for our Stirling engine modules.

For the Swedish and European market further opportunities are identified linked to W2E applications. Initial ambition will be to supplement these energy resources with our Stirling engine HFG technology for the generation of highly sought-after fossil-free electric power.

Stirlingversal plans to further strengthen its market position for this market segment by introducing an optional off-grid concept to provide customized solutions particularly in areas with non-reliable infrastructure (electrical) or with non-existing infrastructure. As the Stirling engine is driven by an external heat source, the in-built versatility of the engine enables minor variations of the hot flue concept to be applied in several similar applications by using the excess heat from numerous industrial processes. The initial focus will be the market in China followed by Europe. In the face of rising waste production and demand for clean energy, Stirlingversal's waste-to-energy method presents a promising solution to the overall objective of waste reduction that doesn't have a negative effect on the climate.

The scale up and commercialization of the HFG-systems (W2E) is outlined as follows:

- HFG demonstrator system initial start-up at customer test site in China - Q4 '22
- Test and verification of novel Control System - Q4 '22
- Test and verification together with commercially integrated burner - Q1 '23
- Test and verification of upgraded prototype - Q2 '23
- Pre-series manufacturing Q2 '23
- First HFG commercial customer site commissioning - Q3 '23
- Serial production of Stirling Engine units in Kunshan - Q3 '23

### Conversion of renewable energy with stirling engine technology

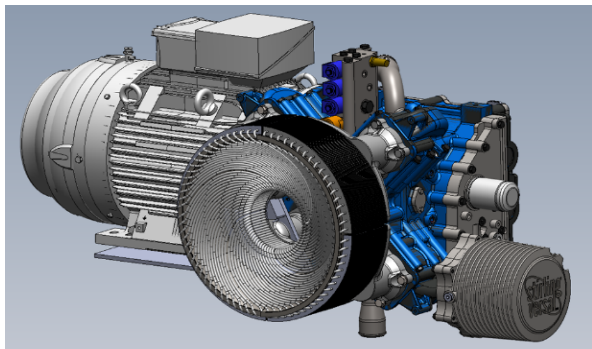
The Stirling Power Conversion Unit (PCU) is very flexible and can be tailored for a variety of applications where energy is converted into grid quality electrical power and heat. Among others these technical possible applications include:

- Combustion of conventional fuels (LNG, CNG, LPG)
- Combustion of biogas or liquid bio-fuels of various origin
- Concentrated heat from solar, CSP
- Hybrid solution with CSP during daytime and combustion of gas after sunset.
- CSP and Thermal Energy Storage, TES (heat battery)
- Conventional combustion and Heat Transfer Fluid, HTF
- Industrial process waste energy (e.g. flare-gas or high temperature process heat)
- Combustion of syngas from pyrolysis of biomass, (biochar as valuable bi-product)

### Evaluation of applications

Realistically all possible applications addressed will not be realized due to several possible reasons such as: limited market demand, technical complexity, cost reasons and competition from alternative technical solutions. Initially the company will focus its efforts on the HFG-solution (W2E). Secondly in due time the company will evaluate the most interesting potential applications in more detail and carefully consider which to develop further. The modularity and fuel flexibility of the stirling engine technology do present interesting features including:

- Customized solutions
- Improved grid stability and off-grid power systems
- Efficient transformation of Waste2Energy – applications such as: Biogas, Landfill, Flare gas, Biomass, Waste incineration and surplus heat in process industries
- The unique heat transfer system (HTS) under development - may also becoming a stand-alone product
- Easy to integrate in stationary P2G2P systems based on hydrogen
- Flexible and scalable to meet expanding demand for electrical power



## RENEWABLE ENERGY – FROM WASTE TO VALUE

### Driving change that enables sustainability and a circular economy

Stirlingversal works in the forefront of transformation where waste instead of being discarded in landfills or burnt are used to create sustainable, local energy and circular energy. Pending the waste material quality Stirlingversal systems may also locally transform waste streams into biochar in addition to renewable energy with close to zero emission. During a pyrolysis gasification process most of the carbon is in this process captured and thereby inhibiting the release of CO<sub>2</sub> into the atmosphere. Users of the Stirlingversal systems have the advantage of waste volume reduction, a high quality bi-product and generating renewable energy.

Waste-to-energy plays a role in transforming residual waste into energy and maximizes the circular economy's contribution to decarbonization. Residual waste is the fraction of waste that cannot be recycled and the only viable solution for residual waste in a circular economy is the recovery of its energy content in advanced waste-to-energy plants with high energy efficiency and low emission. The renewable energy output from waste-to-energy plants contributes substantially to decarbonizing the energy systems in Europe. Moreover, these plants contribute to the European Green Deal objective of securing affordable renewable energy in Europe and it has potential to further substitute fossil fuels in different sectors.

In addition to the above, waste-to-energy plants also prevent non-recyclable waste from ending up in landfills. However, almost half of the European member states still send more than 40 % of their municipal waste to landfills and there is still a foreseeable gap in non-recyclable waste management capacity in the coming decades.

### Stirling engine technology

The Stirling engine was invented in the 1800's. The Stirling Engine Technology has long service life (25+ years), and it is easy to maintain at a low cost due to Stirlingversal's technological advancements. As the Stirling Engines typically operate as separate independent power modules in an overall system, there is built-in system redundancy/failover. What makes it attractive is its ability to efficiently convert heat into mechanical energy. The engine has a limited number of moving parts which increases reliability and minimizes maintenance and service costs. Not many have successfully been able to master the Stirling engine at high power rates other than Saab Kockums for applications such as naval submarines and other civilian applications. The engine concept that has been developed by Saab Kockums, is the only design with electrical power output above 10 kW, which has worked successfully.



### Stirlingversal's state-of-the-art Stirling Engine

Stirlingversal's engines originate from Saab Kockums' design based on a global license from Saab Kockums. Equally important, very large investments have been made on Stirlingversal's engine, in development and re-engineering to enable reliable, sustainable and cost-efficient manufacturing using the automotive industry's principles for volume production. This allows for global sourcing of cost-driving components. Based on the inherent capability of the core product, the Stirling engine, to efficiently generate electricity and heat as desired, a product portfolio is under development for several applications and market segments.



Stirlingversal's state-of-the-art Stirling engine truly represents a completely new design generation with characteristics such as:

- high electrical power output
- high efficiency
- 40% less number of components compared to the original design
- robust and reliable design with long life time
- being service friendly and cost efficient to maintain
- modular design concept supporting flexibility and scalability to meet expanding demand for electrical power

There is a predicted 50% reduction of cost compared to other Stirling technology providers by utilizing a world-class cost-efficient supply chain on a highly commercialized core product. In the future the built-in capability will contribute to further significant cost reductions for the complete product portfolio due to economies of scale and continued utilization of the automotive industry principals.

The Stirlingversal waste-to-energy system is a heat engine driven by an external heat source, with the following features:

- External combustion also suitable for non-clean fuel gases
- Capability to handle large fuel heat value variations
- Flexible to run on fuel gases with change in composition (CH<sub>4</sub>, CO, H<sub>2</sub>, etc)
- Modular engine system design for redundant power production
- Low sensitivity to residual fuel gas particles and dust
- Heat receivers can be designed for optimization for different applications
- Low maintenance cost compared to internal combustion systems
- The modularity allows for customized power output solutions

### **Pyrolysis gasification technology**

Appropriated management of waste is needed to achieve global climate goals and the pyrolysis process represents a crucial technology that enables a circular economy. With the implementation of the Stirlingversal conversion system a sustainable management of waste with negative carbon emission and the possibility to produce green energy can be achieved.

The Stirlingversal biomass conversion system combines an external combustion chamber with our unique next-generation Stirling engine to achieve extremely low emissions and highly efficient combustion. By using the system waste can be converted into carbon-containing biochar and at the same time produce renewable energy. Biochar is produced as a valuable byproduct of converting thermal energy to electricity and heat. Biochar enables permanent storage of the CO<sub>2</sub> bound in the waste which enables companies to turn problematic material into climate-protecting biochar. Stirlingversal's in-house developed control system intelligently manages the production process and optimizes the combustion process for different types and qualities of biomass and other energy sources, demonstrating that waste can be used again in a sustainable way and contributing to a circular economy. Biochar can be used in many different areas, such as:

- Natural soil conditioner
- Natural stable bedding
- Natural additive for composting

## MARKET OVERVIEW

### Introduction

The long-term markets for Stirlingversal is heat to electrical energy focusing both on Bio to energy (Bio2E) and waste to energy (W2E). The markets are briefly described below.

Stirlingversal's go to market strategy is to start with a subset of the W2E market - the Hot Flue market, which has a great potential. By utilizing system integrators like HaiQi, the time to market (ongoing sales process with customers) will be much shorter for this market segment, to prove the commercial ability of our product and build our supply chain capability. When our capability is proven in the smaller Hot Flue market, we will develop new applications for our product to reach more and larger segments of the W2E market.

### Market insight globally

Global waste generation is expected to continue increasing around the world over the coming decades. In 2016, the total waste generation in East Asia and the Pacific amounted to 468 million metric tons. Projections show that by 2050, waste generation only in this region will increase to 714 million metric tons. The average European produces 5 tons of waste each year and over 60% of household waste still goes to landfill. In some of EU countries the need of sustainable waste management and extracting the energy embedded in nonrecyclable waste can play an important role in reducing carbon emission in EU's transition to a more sustainable and circular economy.

The global biomass power market is also expected to grow at a compounded annual growth rate of 6.0% from 2022 to 2030 to reach USD 203.61 billion in 2030.

### Distributed power generation

Stirlingversal's engines has a performance up to 30 kW and can be combined in packs up to about 1MW. This means that small installations can be done locally close to the consumption and thereby reduce the need for transportation and electricity grid infrastructure.

With Stirlingversal's product it is possible to build a distributed power generation that is not as dependent on the electricity grid. This makes our product more competitive in markets that don't have an electricity distribution infrastructure ready for the transition from fossil fuels to the use of electricity for applications like transportation and heating and/or where industry and consumers experiences recurring blackouts that needs to be secured. The fuel flexibility of the Stirling engine technology enables alternative fuels to be used (e.g. hydrogen, biogas, methane, liquid bio-fuels and even fossil gas), thus securing the production of electricity if there is a lack of primary fuels.

### EU – Renewable energy directive

The overall objectives of the Renewable Energy Directive are to achieve an increase in the use of energy from renewable sources by 2030, to foster better energy system integration and to contribute to climate and environmental objectives including the protection of biodiversity, thereby addressing the intergenerational concerns associated with global warming, biodiversity loss and contribute to the EU's technological and industrial leadership along with the creation of jobs and economic growth. Waste to energy applications has an important role in EU's renewable energy directive.

In short, the long-term market for Stirlingversal is huge and the number of potential applications are many.

### **The Hot Flue market – the initial market segment to penetrate**

Waste heat generated from different industrial processes has been identified as an ideal energy source for generating electricity by using the Stirling engine. This energy solution has an enormous potential not only in China but also globally in many other markets with similar applications, where residual heat is being wasted.

Through the partnership arrangement with HaiQi, we are getting access to a network of several end customers being interested in our Hot Flue solution. HaiQi is a system supplier and our Stirling engine will be a component in their HFG and biomass pyrolysis systems. Our initial discussions (formulated in an agreement during 2021) with HaiQi prior to COVID confirmed an interest from HaiQi's end customers of 90 engines during 2022. These discussions were delayed due to COVID and are now ongoing again with updated terms specified terms by Stirlingversal.

We have formulated a detailed plan for finalizing an agreement with HaiQi. The key milestones are:

- Performance acceptance tests (ongoing in Sweden. Planned for February)
- Factory acceptance tests (China. Planned for March)
- Integration/Site acceptance test (at HaiQi's factory, China (planned for April)
- Finalizing contract details and signing procedure (planned for May)
- Delivery of first engines to HaiQi (planned for June)

Our forecast of the demand from HaiQi is 50 engines during 2023, 120 engines during 2024 and 120 engines during 2025. This is a forecast based on discussions with HaiQi.

In parallel with the cooperation with HaiQi, Stirlingversal is also in discussions with ZhongJing Group, a Chinese technology developer and provider that provides environmentally friendly solutions to handle waste from the production processes of the steel, electric power and chemical industry. Their customers generate huge amounts of hot gases that is currently burnt off and we see a big potential in using those gases as energy source for our Stirling engine modules. Similar to the partnership with HaiQi, the ZhongJing Group network also provides readily access to a wide range of potential end customers, altogether with limited marketing efforts required from Stirlingversal.

For the Swedish and European market, interesting dialogues are ongoing with several stakeholders and industrial groups linked to W2E applications, to the utilization of residual products from the forest industry and to the emerging hydrogen industry. Opportunities are identified to be able to supplement these energy resources with our Stirling engine technology for the generation of highly sought-after fossil-free electric power.

Our sales forecast (number of Stirling engines) for the Hot Flue market is 65 engines during 2023, 270 engines during 2024 and 450 engines during 2025.

## ORGANIZATION

### Management

Lars Larsson, CEO and Board Member

- 40+ years of industrial experience including various engineering and management positions
- Former head of Stirling Technology at Saab Kockums
- Stirling engine specialist
- Co- founder and former CTO of Ripasso Energy (now Swedish Stirling AB, Nasdaq listed)
- Co- founder of Stirlingversal AB

Johan Mattson, CTO

- 25+ years of experience in design management, engine and advanced energy systems development at Volvo corporations and Swedish Stirling AB (former Ripasso Energy AB)
- Expert in engine and energy system design with specialization in hot component design and material technology.
- Long experience in leading large product development projects.
- Strong competence in product cost reduction and industrialization.

Johan Arrhenius, General manager, China operations

- 20+ years of supply chain and manufacturing leadership experience in China
- Fluent in Chinese

Qijiang Li, Supply Chain Manager

- 12+ years of supply chain and project management from European and Chinese advanced industrial projects

Håkan Garmer

- Advisor within organizational management
- 17+ years experience from working and living in China
- Business facilitator Sweden-China relations
- Co-founder of Stirlingversal
- Fluent in Chinese

Personnel involved in Company operations

*Sweden:* employees and consultants: 7-12

*Kunshan, China:* employees and consultants: 6

### Board of Directors

Björn Flink, Chairman of the Board

- 25+ years of experience in auditing and advisory regarding capital markets, corporate governance, risk management, etc.
- Co-founder of Stirlingversal

Tore Svensson, Board Member

- 40+ years of industry experience incl. senior positions in project development, sales and business development
- Senior Sales Executive Kockums AB
- Co- founder and Sales Director of Ripasso Energy (now Swedish Stirling AB, Nasdaq listed)
- Co- founder of Stirlingversal

Lars Bierlein, Board Member

- CEO Qvantum Energi AB
- Extensive experience in business development, innovation, and scaling within the energy sector

**Auditor**

KPMG AB, responsible auditor Jenny Jansson

**Additional information**

No board member or senior executive in Stirlingversal AB (publ) has been involved in bankruptcy, liquidation or the like during the past five years. No board member or senior executive has at any time in the past five years been convicted in fraud-related cases, banned from business or exposed to accusations or sanctions by authorities.

## SHAREHOLDERS CAPITAL & OWNERSHIP

### Shareholder capital

The share capital is 607 057,68 SEK distributed over 948 477 shares, which gives a quota value per share of 0,64 öre.

### Convertible

The convertible bond holders converted their bonds of a value of 3 320 780 SEK to 148 249 new shares in the end of February 2023 and that money has capitalized the Company prior to this issue.

### *Development of the shareholder capital*

Date	Action	Number of Shares	Share Capital
2023-02-28	Convertible	148 249	607 057,68
2021-08-31	New issue	800 228	512 178,70
2021-10-28	New shares	781 200	
2021-10-28	Bonus issue (no new shares)		500 000
2021-08-17	New issue	7 812	78 120
2021-05-03	New issue	6 805	68 050
2021-02-04	New issue	6 459	64 590
2021-02-04	Establishment of the share register	6 058	60 580

### Ownership structure

Presented below are the five largest shareholders. Number of shareholders amounts to 315 persons. All shares have the same security in the Company. The Company only holds ordinary shares.

Name	Number of shares	In %
Lars Larsson	111 600	13,95
Tore svensson	106 850	13,35
Håkan Garmer	105 720	13,21
Björn flink	70 200	8,77
Seniorit ab	67 200	8,40
Others	338 658	42,32

Dilution at full subscription is 18,76 %.

## FINANCIAL INFORMATION

### Budget

(KSEK)	2023	2024	2025	2026	2027
Revenue	17 000	152 100	263 300	289 600	318 500
COGS*	-27 100	-108 400	-178 200	-191 900	-208 900
Gross Profit	-10 100	43 700	85 100	97 700	109 600
Swedish Operations**	-8 700	-11 700	-12 900	-14 200	-15 600
Cashflow	-18 800	32 000	72 200	83 500	94 000
Number of HFG units delivered	30	260	450	495	544

\* Including manufacturing overhead in China and Sweden

\*\* Management, sales, product development & other

### Action plan

Year	Action plan
2023	Start up production of HFG, further strengthen supply chain efficiency and continuous performance enhancement. Deliveries as from H2.
2024	Seek broader customer base and introduce new HFG-application, ramp up of production and continuous performance enhancement.
2025	Introduce new HFG customers. Development, networking and testing of new applications on engine.
2026	Develop, test and contracting of new high-value applications
2027	Seek and win broader customer base for applications and continue performance enhancements. Develop, test and contracting of new high-value applications

### Condensed Income Statements

(KSEK)	2019	2020	2021	2022
Net sales	0	0	0	0
Operating costs	-1 502	-3 668	-8 612	
Operating result	-1 502	-3 668	-8 612	
Financial costs	0	-9	-30	
Net income/loss before tax	-1 502	-3 677	-8 642	
Tac	-	-	-	
<b>Profit/loss for the period</b>	<b>-1 502</b>	<b>-3 677</b>	<b>-8 642</b>	

### Condensed Balance Sheets

(KSEK)	2019	2020	2021
Intangible fixed assets	4 394	4 127	3 502
Tangible fixed assets	1 195	1 196	1 440
Financial fixed assets	0	3 767	10 098
Current assets	254	238	1 204
Cash and cash equivalents	3 246	135	20 630
<b>Total assets</b>	<b>9 098</b>	<b>9 463</b>	<b>36 874</b>
Total equity	8 674	8 611	33 619
Long-term liabilities	-	458	333
Current liabilities	415	394	2 922
<b>Profit/loss for the period</b>	<b>9 089</b>	<b>9 463</b>	<b>36 874</b>

# ARTICLES OF ASSOCIATION

Stirlingversal AB (publ) 559096-2105

## **§1 Name**

The Company's name is Stirlingversal AB (publ). The Company is a public limited liability company.

## **§2 Domicile**

The Company has its domicile in Lund municipality

## **§3 Operation**

The Company shall carry out product development and offer services in the field of energy with a main focus on renewable energy sources, own and operate energy facilities for the production and delivery of electricity, own and manage real and movable property and conduct activities compatible therewith.

## **§4 Share capital**

The share capital shall be no less than 500 000 SEK and no more than 2 000 000 SEK.

## **§5 Number of shares**

The number of shares in the Company shall be no less than 781 200 and no more than 3 124 800.

## **§6 Board of directors**

The Board shall consist of no less than 3 and no more than 5 members, with no less than 0 and no more than 3 deputies.

## **§7 Auditor**

The Company shall appoint no less than 1 and no more than 2 auditors, with no more than 2 deputies. An authorized auditor or a registered auditing company must be appointed as auditor, and, where applicable, deputy auditor.

## **§8 Notice to the General Meeting**

Notice shall be given by announcement in Post- och Inrikes tidningar and by notice on the Company's website. That notice has been made must be announced in Dagens Industri. General Meeting shall be able to be held, apart from in Lund municipality (corporate seat), in Stockholm and Gothenburg.

## **§9 Notification of, and the right to participate in, the General Meeting**

Shareholders who wish to participate in the General Meeting must register with the Company no later than the day stated in the notice to the General Meeting. This day must not be Sunday, another public holiday, Saturday, Midsummer's Eve, Christmas Eve or New Year's Eve and not fall earlier than the fifth weekday before the meeting. Shareholders may bring one or two assistants to the General Meeting, but only if the shareholder has notified this in accordance with the previous paragraph.

## **§10 Agenda at the Annual General Meeting**

Following matters shall be addressed at the annual shareholders meeting:

- Election of chairman for the meeting
- Establishing and approval of voting list
- Approval of agenda
- Election of one or two to verify the minutes
- Determination of whether the meeting has been duly summoned



- Presentation of the Year-end Review and the auditor's report as well as, where applicable, the consolidated accounts and the consolidated audit report.
- Decision regarding:
  - determination of the income statement and the balance sheet and, where applicable, the consolidated income statement and the consolidated balance sheet
  - dispositions regarding the company's profit or loss according to the established balance sheet, and
  - discharge of liability for the Members of the Board and the Managing Director
- Determination of the number of Board members and Board deputies and, where applicable, the number of auditors and deputy auditors
- Determination of fees for the Board and auditor
- Election of the Board and any deputy board members and auditor and any deputy auditors
- Other matter, which must be taken up at the General Meeting according to the Swedish Companies Act (2005:551) or the articles of association

### **§11 Proxy collection and postal voting**

The Board may collect powers of attorney according to the procedure specified in ch. 7. Section 4, second paragraph of the Swedish Companies Act (2005:551). The Board may decide before a General Meeting that the shareholders can exercise their voting rights by post before the General Meeting.

### **§12 Fiscal year**

The fiscal year is January, 1 – December, 31

### **§13 VPC Company**

The Company's shares shall be registered in a reconciliation register according to the Financial Instruments Act (1998: 1479) on VPC and account-keeping of financial instruments.

## CONTACT INFORMATION

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