



WE RECYCLE
WASTE HEAT
INTO
CLEAN
POWER

€



SOOMIQ Presentation incl. Financials
for Finadvice for confidential use
7 November 2024

EXECUTIVE SUMMARY #WeRecycleWasteHeat

PRODUCT PRESENTATION & USP

- ORC (Organic Rankine Cycle) systems use special working media to generate electricity from low input temperatures. This makes them suitable for generating electricity from waste heat.
- The PowerQube generates electricity from waste heat at a temperature of 100 to 200°C without requiring any other energy supply in addition to the waste heat.
- Thanks to a compact and cost-effective design and an innovative, environmentally friendly working medium, the electricity generation costs between 8 and 16 ct/kWh only, with an average amortization period of 3.2 years.

MARKET DESCRIPTION & ADVANTAGES

- There are 100 TWh/a of unused waste heat (100-200 °C) available in the EU+UK, which could generate 7 TWh/a of electricity. The market for waste heat in the EU+UK is worth € 3.5 billion (SAM) and US\$ 18.3 billion worldwide (TAM), while the global market for waste heat to electricity is worth over US\$ 66 billion.
- The PowerQube has an output of 20kW. It is therefore suitable for 90% of locations where waste heat is generated and is without competition in this market segment.

COMPANY & CAPITAL REQUIREMENTS

- The core team of SOOMIQ consists of Stefan Graber (30 years of experience in finance, international business development and energy projects), Justin Moldovan, B.Eng. (process engineering) and Dr. Lingze Wang (sales, cooperation Asia, legal).
- Our partners Fraunhofer UMSICHT, FRINTEC, DEPRAG, Chemours, Kühner and others are SOOMIQ's extended team partners and actively involved in the development.
- Capital requirement for current seed round: € 675,000 for setting up a prototype test stand at Fraunhofer UMSICHT by mid-2025 (of which € 175,000 has already been raised).

*Net amount, after deduction of transaction costs

60% OF THE ENERGY USED IN PRODUCTION IS LOST AS WASTE HEAT. THAT IS MORE THAN 11% OF THE TOTAL GERMAN ENERGY DEMAND.

Unused waste heat is expensive

17bn.

€/year
in the EU

(EU RED Heat-to-Power)

Unused waste heat is harmful to the environment

60m.

tons CO₂/year
in Germany

(Federal Environment Agency and dena – German Energy Agency)

Unused waste heat is mainly generated below 200°C

=70%

of industrial waste heat
EU and worldwide

(European Commission)

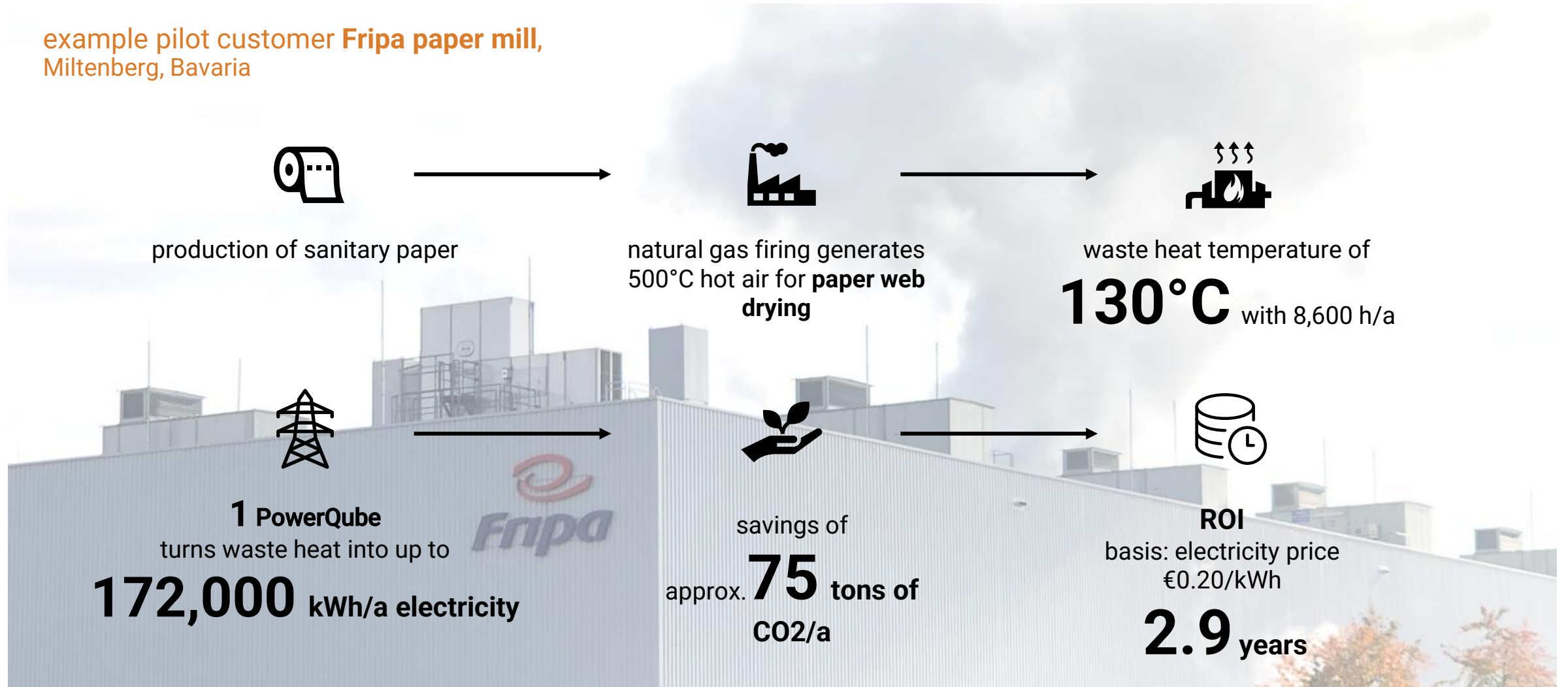
- **No solutions to date** for using waste heat below 200°C economically
- **No products** for waste heat recovery for small quantities of waste heat

**Obligation
to utilize
waste heat!**

(German Energy
Efficiency
Act)

POWERQUBE TURNS WASTE HEAT INTO CLEAN ELECTRICITY. EXACTLY WHAT OUR CUSTOMERS WANT: TO SAVE COSTS AND CO2.

example pilot customer **Fripa paper mill**,
Miltenberg, Bavaria



POWERQUBE – HOW IT WORKS?

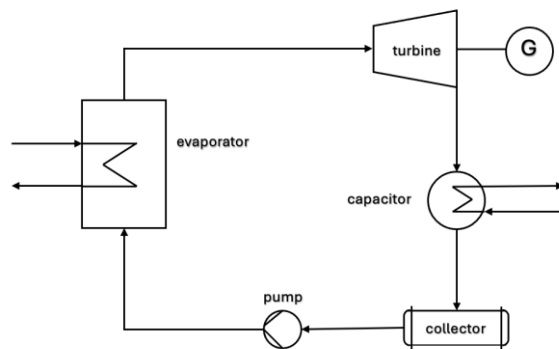
Process description: SOOMIQ's ORC Plant

PowerQube development goal

Key data of the development goal

- Electrical output of 20 kW_{el}
- Lower temperature range: 110 - 150°
- Further development goals: small, light, efficient

Supported by **Fraunhofer UMSICHT**
(Contract Research)



- The ORC cycle starts the energy conversion of the exhaust gas/exhaust air in a heat exchanger without a previous intermediate thermal circuit →
- The working medium, a fluid that is not harmful to ozone or the climate, evaporates under the effect of heat and develops steam pressure →
- The pressure is released via a gearless microturbine that drives an integrated generator that produces the electricity →
- After expansion, the steam enters a second heat exchanger, the condenser, which is cooled in an integrated way so that the steam liquefies – alternatively an external cooling source can be used - →
- and is fed back into the cycle as a working medium.



Justin Moldovan, B.Eng., Process Engineering SOOMIQ: *"Our PowerQube energy cube efficiently converts unused waste heat in the production process of SMEs and industry into electricity that can be immediately used again in the company - the optimal solution for many companies that have primarily lower waste heat temperatures"* .

THE ELECTRICITY PRODUCTION COSTS (LCOE) OF POWERQUBE FALL AS THE NUMBER OF UNITS INCREASES. PV IS NOT AN ALTERNATIVE DUE TO THE OBLIGATION TO USE WASTE HEAT (IN GERMANY).

power generation even
at low temperatures
from 110°C



modular
expandable



small size
for easy integration into
existing structures



The PowerQube in 3D
and real size in the
factory environment
Simply try it out

Electricity available 24/7	LCOE 2024	LCOE 2045
Biogas	20 – 33 €ct/kWh	25 – 43 €ct/kWh
GuD power plant	9 – 15 €ct/kWh	14 - 41 €ct/kWh
PV (roof/outdoor incl. battery)	6 – 16 €ct/kWh	5 - 14 €ct/kWh
PowerQube	8 – 16 €ct/kWh	5 – 10 €ct/kWh
Electricity <u>not</u> available 24/7		
PV (roof/outdoor without batt.)	4 – 12 €ct/kWh	3 - 10 €ct/kWh
Wind Onshore	4 – 9 €ct/kWh	4 - 8 €ct/kWh
Wind Offshore	6 – 10 €ct/kWh	6 – 10 €ct/kWh

Sources: Fraunhofer ISE and
own calculation for PowerQube
July, 2024

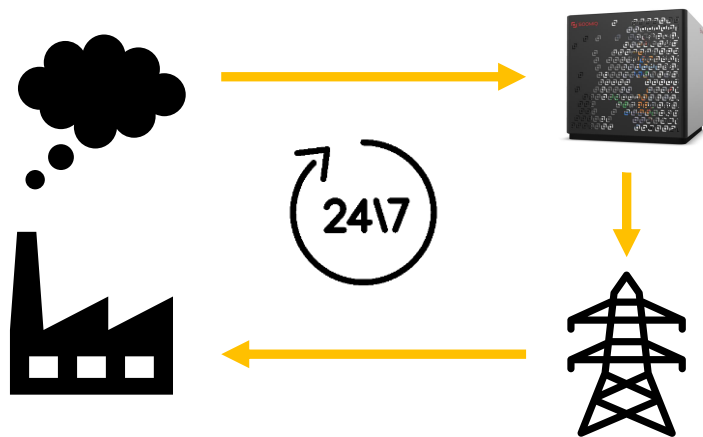


**cost-effective
system** due to series
production in large quantities

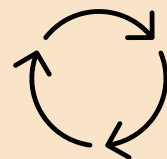
THE PERFECT CYCLE FOR HIGH POWER GENERATION.

PowerQube uses waste heat (exhaust air, exhaust gases) to generate electricity.

The self-generated electricity can be used immediately in operation - **24/7** ...



..., while electricity from renewables is not always available and is considerably more expensive.



Circular process design
with direct coupling of
exhaust gas/exhaust air
and air cooling.









High power generation
through innovative, simple cycle
process design with



sustainable working
medium without Ozone Depletion
Potential (Zero ODP) and very low
GWP (Global Warming Potential).




UNLIKE OTHER PROVIDERS OF SMALL ORC SYSTEMS, WE OFFER SOLUTIONS FOR THE €3.3BN. INDUSTRIAL CUSTOMER MARKET (EU+UK).

competitor 20 kW _{el} ORC (Organic Rankine Cycle)	 Germany	 France	 Spain
positioning	Goal: Market leader for small ORC systems for 100-200°C for SMEs and industry	market leader in biomass/biogas post-conversion in France	focus on higher waste heat temperatures, ORC for low temperature not prioritized
history, installation basis	Next: set up of test stand at Fraunhofer UMSICHT; interest in over 100 PowerQube's	turnover 2023: €5m, focus on France	only a few installations with a focus on biomass, focus area: Spain
industry focus	industry	biomass	biomass
waste heat temperature	100–200°C exhaust air/gas (direct)	70–120°C water, steam, oil (intermedia cycle with water)	90–180°C exhaust gas, steam (intermedia cycle with water/thermal oil)
direct waste heat utilization			

indirect competition for waste heat utilization



heat pumps and heat exchangers



-  only if process heat is required
-  a lot of waste heat is lost
-  high effort and costs

Chillers



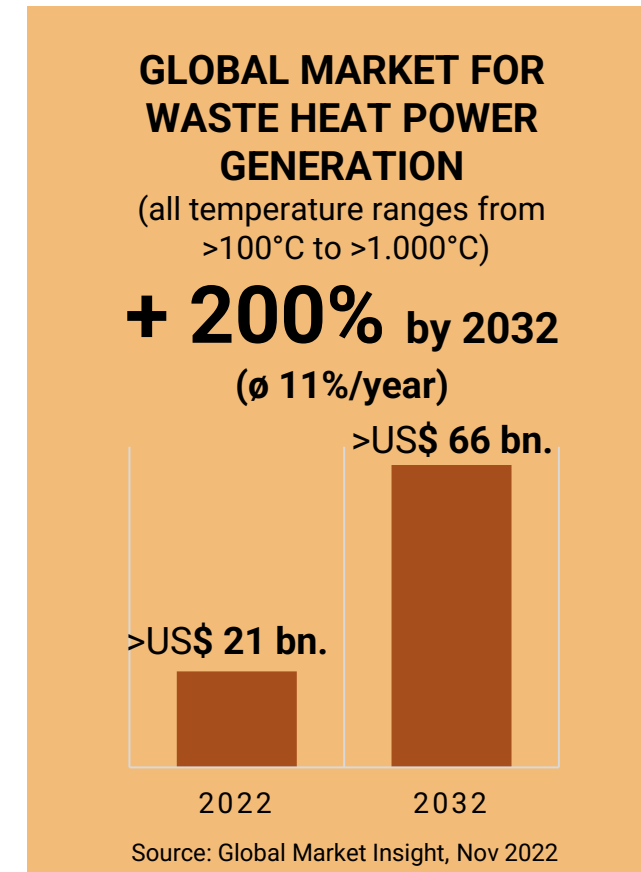
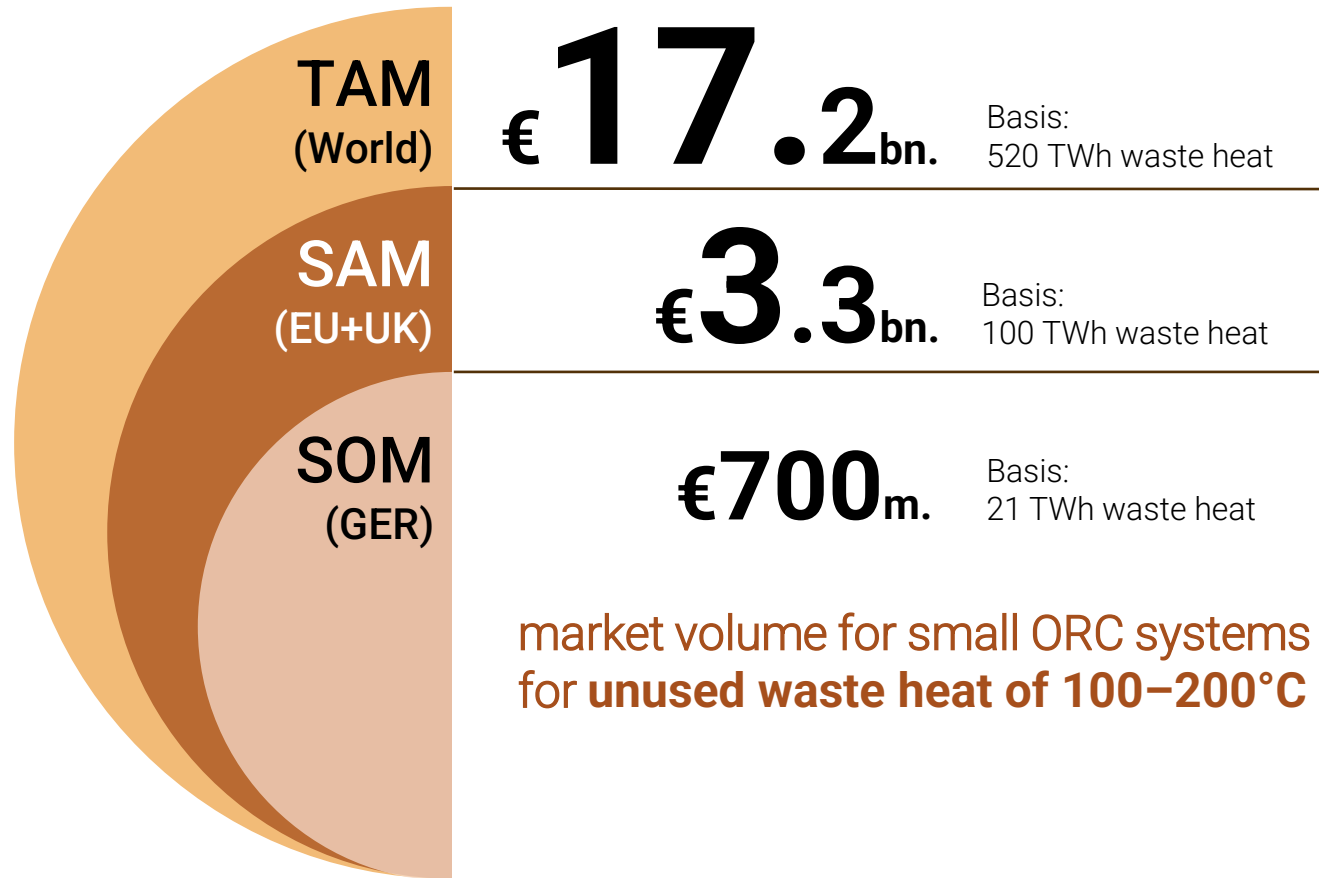
-  only if cooling is required at the location
-  high investment costs and space requirements

“ There are no other solutions on the market. That's why we contacted SOOMIQ, according to one of our interested customers in the dried fruit processing sector.

Our direct competitors have focused on the biomass sector with their 20 kW ORCs and require a second liquid-based cycle.

The much larger industrial sector has not been tapped, which opens up an excellent opportunity for SOOMIQ with the direct use of industrial waste heat.

CONVERSION OF WASTE HEAT BELOW 200°C INTO ELECTRICITY: A PREVIOUSLY UNDISCOVERED €17 BILLION MARKET FOR SOOMIQ WITH >11% ANNUAL GROWTH.



Sources: Waste Heat Potential EU+UK: Research Papier „Industrial waste heat: Estimation of the technical available resource in the EU per industrial sector, temperature level and country“, 2018 and Global Market Insight 2022
Data base: Market volume for small ORC systems at an average of €80,000 per 20 kWel ORC system with electricity generation of ø 150 MWh/year

COMPANIES IN THE EU HAVE THE MOST WASTE HEAT.

... This is our market: waste heat between 100 and 200 °C. A 100 TWh market in the EU that is not yet being served and accounts for 1/3 of the total waste heat potential.

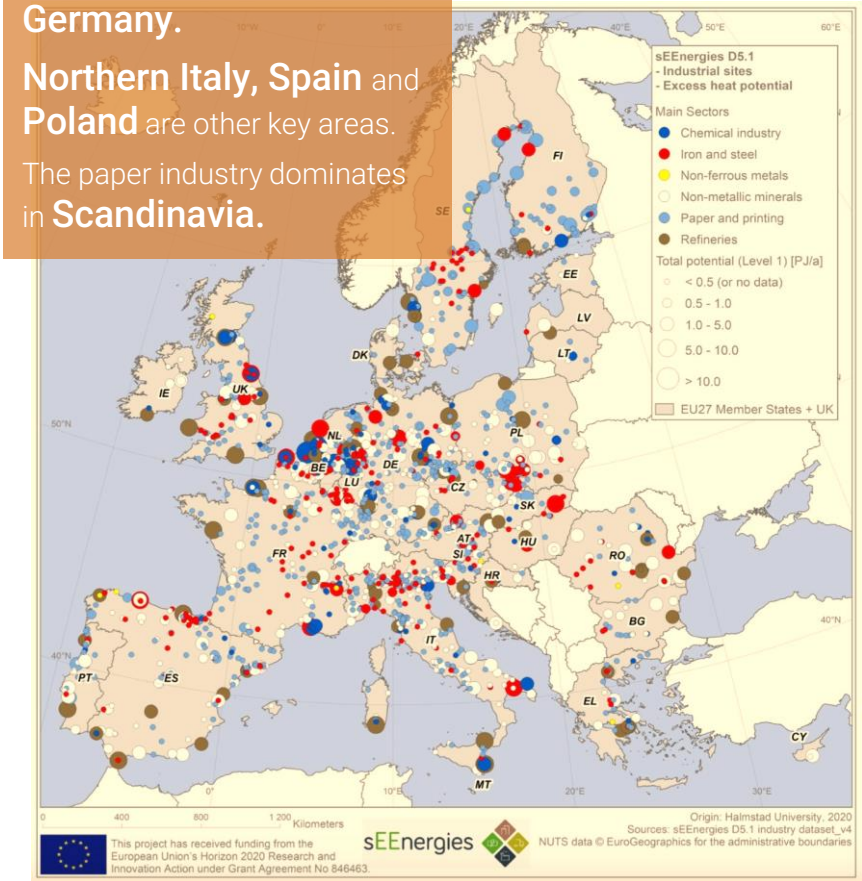
Excess heat potential in EU28 (TWh/year)									Electricity	
T° range in °C	Iron & Steel	Non-ferrous metal	Chemical	Non-metallic mineral	Food & drink	Paper & printing	Other sectors	Total	Conversion efficiency	Energy TWh/year
>100	1.2							1.2		
100-200	16.5		3.2	47.9	12.5	20.2	1.9	102.1	7%	7.1
200-300	52.3							52.3	20%	10.5
300-400	14.5		1.1	4.0				19.6	25%	4.9
400-500			6.2					6.2	37%	2.3
500-1000	77.4		21.3					98.8	50%	49.3
>1000	23.9							23.9	54%	12.8
Total	168.1	16.5	10.5	73.2	13.7	20.2	1.9	304.1		86.9

Sources: European Commission „Clean Energy Transition-Technologies and Innovations Report (CETTIR) and Waste heat potential for EU+UK: Research Paper „Industrial waste heat: Estimation of the technical available resource in the EU per industrial sector, temperature level and country“, 2018 and H2020 project RED-Heat-to-Power, 2018

In the EU+UK, most industrial waste heat is generated in Germany.

Northern Italy, Spain and Poland are other key areas.

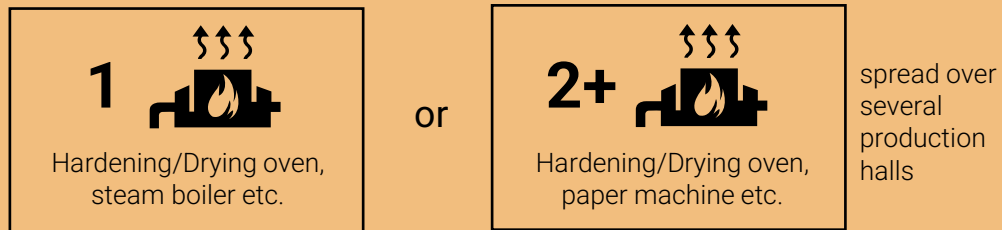
The paper industry dominates in Scandinavia.



“Waste heat between 100 and 200 degrees Celsius has the greatest potential for waste heat recovery” was determined by the Niederrhein University of Applied Sciences in a short study published in October 2024. At higher temperatures, waste heat recovery does not have the greatest user potential; here, the study primarily recommends heat recovery, improved user behavior and electrification.

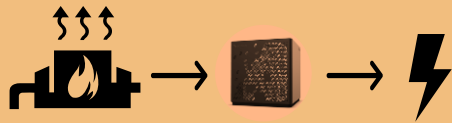
WHY DOESN'T SOOMIQ FOCUS ON THE MARKET WITH HIGHER WASTE HEAT TEMPERATURES AND LARGER WASTE HEAT VOLUMES?

90% of companies from almost all sectors, such as metal processing, chemicals, brick and ceramic production, food processing and paper production, have **smaller waste heat quantities** and usually only operate



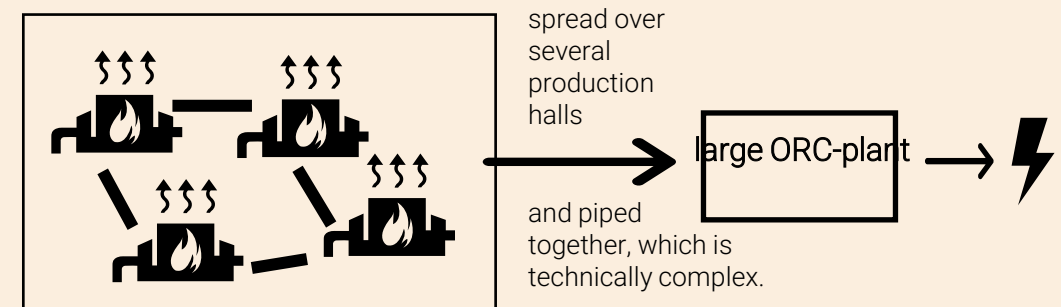
with waste heat volumes for 1 or max. 2 PowerQubes with **20 kW_{el}** per furnace,

in which **electricity is generated directly at the waste heat source**, which avoids heat losses and saves costs.



SOOMIQ is the only supplier that recycles smaller amounts of waste heat of around 300 kW and lower temperatures from 110°C directly into electricity!

Only **10%** of manufacturing companies have **large amounts of waste heat**, such as large steel and aluminum plants or cement factories, where the use of larger ORC systems can pay off.



Suppliers of larger ORC systems that require a lot of waste heat

orcan energy	50 – 150 kW _{el}
ElectraTherm	75 – 150 kW _{el}
Dürr Cyplan	50 – 1000 kW _{el}
Triogen	100 – 170 kW _{el}

Direct waste heat utilization only possible at high temperatures; at lower temperatures, a water or thermal oil circuit is connected upstream.



With large quantities of waste heat, it is often worth transporting the waste heat over longer distances, e.g. through a **heat pipe** to a **consumer** such as a school or residential area, so that electricity generation using ORC is not economical.

WE START DIRECTLY WITH OUR INTERESTED INDUSTRIAL CUSTOMERS AND THEN BUILD UP A MULTI-CHANNEL STRATEGY.

Target Customers



industries:

- metal processing
- vehicle manufacturers
- paper, decors
- glass, ceramics
- chemicals, pharmaceuticals
- bricks, clay, sand-lime bricks
- food processing



Waste heat temp.

110–200°C



Waste heat quantity



from 290 kW

Sales Strategy 2025 and 2026



direct sales

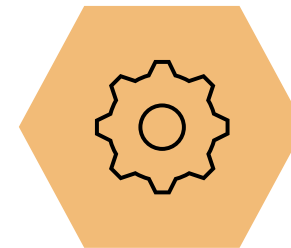
to existing and new industrial customers

additionally from 2027



education & training

for manufacturers of energy systems, components and engineering companies



Component manufacturer + engineering companies



energy consultants

Waste heat utilization obligation is a "booster" for SOOMIQ



Utilities & Contractors

PowerQube as part of energy-saving contracting



mechanical engineers

PowerQube + own systems as a "bundle"

Target Countries



Germany, Austria, Switzerland

Target Regions additionally from 2027



EU+UK, Turkey, Asia

SOOMIQ'S POWERQUBE MEETS THE DEMAND. COMMITMENTS FROM PILOT CUSTOMERS AND A STRONG CUSTOMER BASE PROOF IT.

Pilot customers who want to install PowerQube's in their plants

3 Use cases (pilot customers)	Fripa paper mill	CoorsTek technical ceramics	KURZ coating solutions
waste heat temp.	130°C	110°C	113°C
total CO2 savings	abt. 220 t/a (3 PQ)	abt. 70 t/a (1 PQ)	abt. 300 t/a (4 PQ)
total electricity cost savings	€100,000/a (ROI 2.9y)	€35,000/a (ROI 4.7y)	€140,000/a (ROI 3.8y)

other interested customers (selection):

UPM COMMUNICATION PAPERS



apollo TYRES

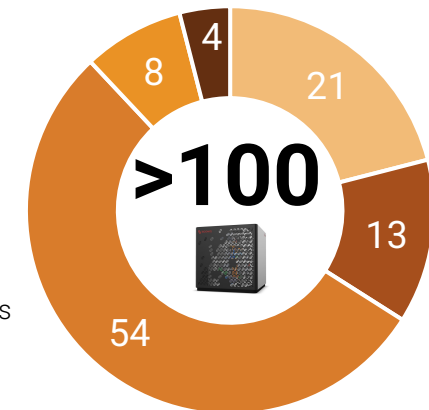
EMS



current concrete customer interest

DEMAND FOR POWERQUBES AMONG
15 CUSTOMERS
(plant visits)

- glass, ceramics
- paper, decors
- metal, machines
- chemistry, plastics
- food

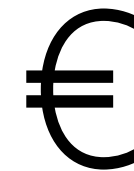


“ We are very confident about starting a pilot project with SOOMIQ, as we are currently "blowing out" a lot of unused energy to the chimney.

Mondi Inncoat, European group in the paper, plastics and adhesive tapes sector




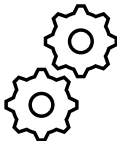




>6,000t
less CO2/year



>€11m.
sales volume

WHAT HAS ALREADY BEEN ACHIEVED, WHAT DO WE WANT TO ACHIEVE AND WHEN?

2023	until Q3/2024	Q1/2025	2025	
<p>BASIC ENGINEERING</p>  <p>Fraunhofer UMSICHT (contract research)</p> <p>definition of key components:</p> <p>DEPRAG machines unlimited turbine generator</p> <p>Opteon working medium</p>	<p>EXT. BASIC/ DETAIL ENGINEERING</p>  <p>FRINTEC GmbH process solutions ■ measurements ■ engineering ■</p> <p>in cooperation with</p> <p>Fraunhofer UMSICHT (contract research)</p>	<p>PROTOTYPING</p>  <p>After delivery of components for the prototype</p> <p>construction of pilot plant test stand at</p> <p>Fraunhofer UMSICHT-Technical center</p>	<p>PILOT-INSTALLATIONS/TESTS</p>  <p>at</p> <p>KURZ </p> <p>Fripa Immer eine Lage besser</p> <p>COORSTEK</p> <p>and other interested customers</p>	<p>OPTIMIZATIONS/ START 0-SERIES</p>  <p>further developments in 2025 and beyond:</p> <p>Adaptation >200° C and complex exhaust gases</p> <p>R&D innovative heat exchangers and control technologies ("Flex-ORC")</p>
TLR 3	TLR 4/TLR 5		TRL 6/TRL 7	TRL 8/TRL 9
€475,000 invested ✓	€350,000 invested ✓	€775,000 investment target	pre-financing, investment by customers and VCs	
Pre-seed Investment (crowdfunding, Convertible loan)		Seed Investment (convertible loan, equity investment)		Series A (before market launch)

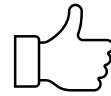
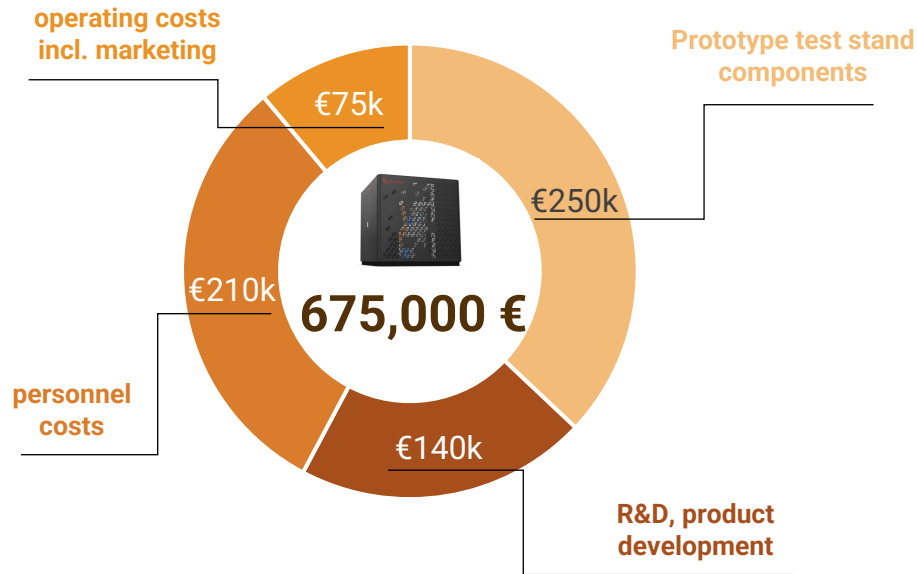
WE NOW WANT TO RAISE €675,000*. WE HAVE ALREADY RAISED €175,000 OF THIS.

USE OF FUNDS for 10 months

construction of prototype test stand at Fraunhofer UMSICHT

for

Why is now the right time?



Great customer interest

- demonstrably available, because
- no solution for waste heat generation for lower temperatures and smaller quantities of waste heat available on the market



High electricity prices, that will last in the long term, as

- doubling electricity demand by 2045 through transformation
- enormous costs for grid expansion



Reduce greenhouse gases to

- become climate-neutral or GHG-positive in the short term and
- communicate this to the public through the use of innovative energy efficiency technologies (waste heat recovery)



Legal requirements (obligation to use waste heat in accordance with the Energy Efficiency Act of the German Government)

- to be implemented promptly
- requires new innovative solutions that can be implemented quickly

already successfully raised €175,000
(from the financing goal of €675,000*)

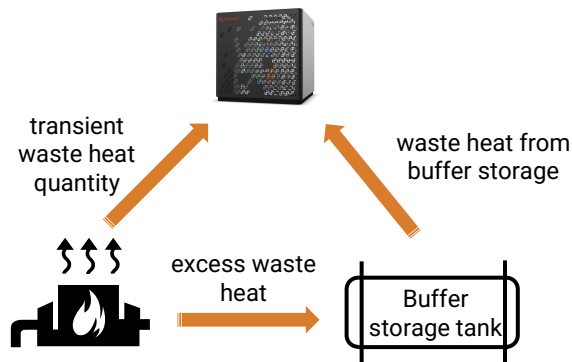


*Net amount, after deduction of transaction costs

HARDWARE-FOCUSSED INNOVATIVE CLIMATE TECH'S BENEFIT FROM THE CLIMATE TRANSITION - MANY OPPORTUNITIES FOR BUY AND BUILD AND LATER EXIT.

1 + 1 GOOD OPPORTUNITIES FOR BUY AND BUILD

= not 2,
but
more



Normal operation: SOOMIQ's PowerQube requires a waste heat output of approx. 300 kW with as constant operation as possible.

Problem: Fluctuating waste heat flows in some operations > PowerQube cannot be operated continuously at full load.

Solution: Excess heat can be stored and released to the PowerQube as required by using buffer tanks. This enables the PowerQube to be used even with discontinuous waste heat sources.

Result: The operating times of the PowerQube in full-load operation are increased and energy losses are avoided.



Through the combination with a buffer storage tank, the **PowerQube continuously supplies 20 kW of electrical power even with discontinuous sources.** The storage of heat and electricity will become increasingly important and economical with flexible electricity contracts in the future.



MANY REALISTIC EXIT SCENARIOS FOR INVESTORS



- Acquisition by energy system/component manufacturers. Example: Viessmann > Carrier
- Takeover by plant and machine manufacturers, e.g. Manufacturer of industrial ovens
- Merger with manufacturer of heat storage tanks (see above) or large heat pumps
- Equity Investment of strategic investor or financial investor. Example: Jenbacher CHP > GE > Advent Private Equity > ?
- Initial Public Offering (IPO)

OUR SOOMIQ TEAM "ON AEG" IN NUREMBERG, ONE OF THE LARGEST R&D CLUSTERS FOR ENERGY TECHNOLOGIES IN EUROPE



STEFAN GRABER

Managing Director, CEO

 Banker
COMMERZBANK 

30+ years in finance, business development and project management

- Co-Founder and CEO Venture Select GmbH, Munich, et al. IPO of Accuray Inc. (NASDAQ), acquisition of Endoxon by Google.
- CFO OncoMed-Solutions GmbH, Switzerland



JUSTIN MOLDOVAN

Energy/Process Engineering

 B.Eng. Process Engineering
ohm Technische Hochschule Nürnberg




Several years of practical experience in ceramic materials technology, academic knowledge in system design, measurement and thermal process engineering

- Employee Ceramix AG - hybrid insulation granules for the brick and tile industry.
- Currently studying for a Master's degree in Energy Technology at FAU (Friedrich-Alexander-University Erlangen-Nuremberg)



DR. LINGZE WANG

Country Manager Asia

 Juris Doctor 
B.Sc. Chemistry 

30+ years of intercultural contract negotiations with Chinese and Asian partners, especially joint ventures and license agreements

- CEO SINODE Shipbuilding Consulting & Brokerage GmbH, Hamburg, Shanghai
- Associate Lawyer, Altheimer and Gray, USA





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