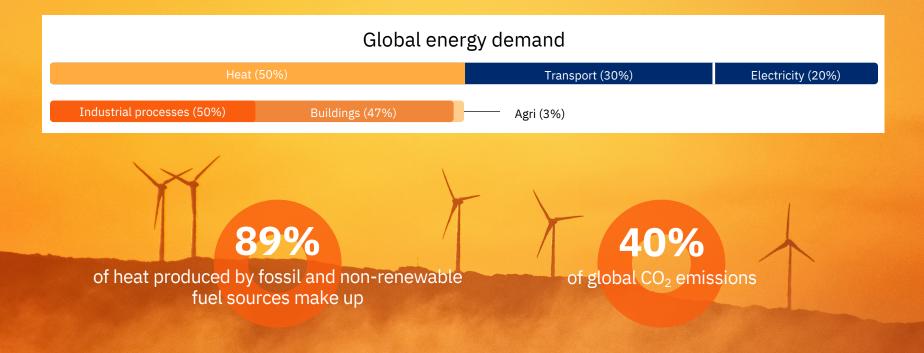


## Heat accounts for half of global energy consumption





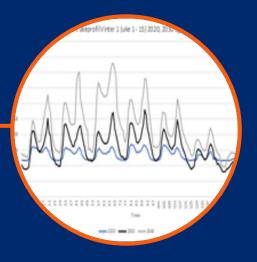
# The challenge: increasing price volatility



The world is not on track to limit the rise in global temperature to 1.5° celcius...



Urgent need for energy transition and electrification through renewables



The challenge: increasing volatility



# Agenda

- Kyoto's solution
- Financial highlights
- Operational highlights
- O Commercial update
- Q&A







# **Kyoto's solution**

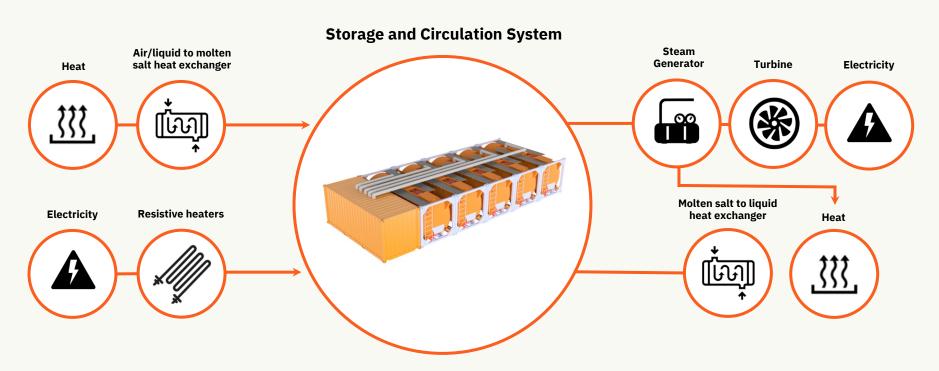
# The Heatcube™





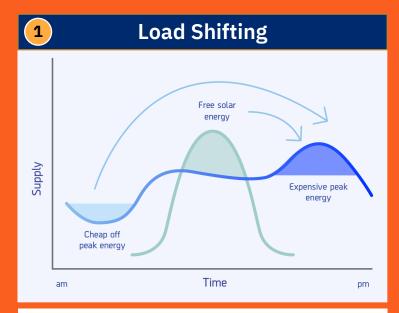
## Modular applications of the Heatcube™

Same product, multiple configurations drive flexibility and reduce cost





# Kyoto's Heatcube™ enables industrial partners to benefit from off-peak electricity prices and from participating in the reserve market



### **Load Shifting:**

- Charging at cheapest hours
- Moving from gas / oil / coal to electricity



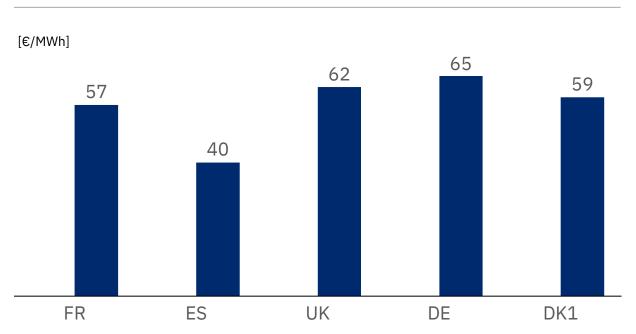
#### **Reserve Market:**

 Offer storage to the grid provider and participate in the reserve market



# Only looking at load shifting as a value creator: industrial clients can save 40-65 €/MWh by load shifting

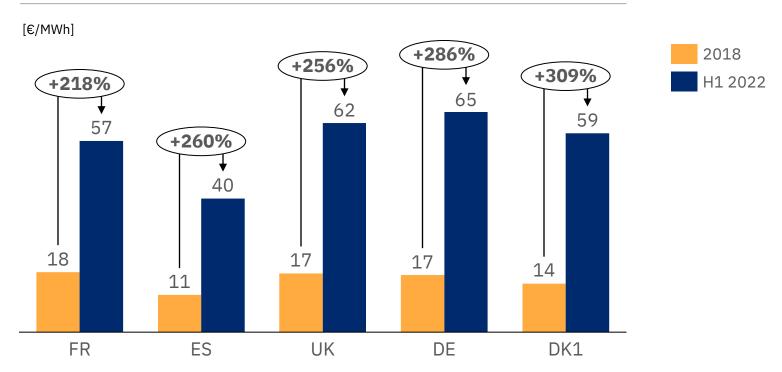
Price difference between 5 cheapest hours and 6am-22pm spot prices (H1 2022)





## This price difference is now 3-4x higher compared to 2018

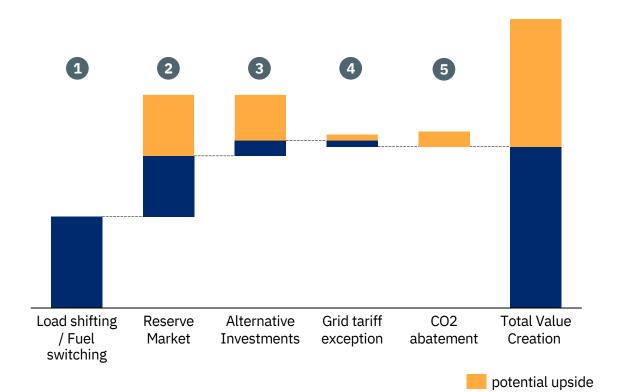
## Change in Price Difference (5 cheapest hours vs. 6am-22pm)







# Breakdown of the entire value creation of the Heatcube™



## Load Shifting / Fuel switching:

- · Charging at cheapest hours
- Moving from gas / oil / coal to electricity

## 2 Reserve Market:

 Offer storage to the grid provider and participate in the reserve market

### **3** Alternative Investments:

 No replacement / upgrade investment into current solution

## 4 Grid tariff exception:

- Now: potentially higher fees due to higher peak demand
- · Later: exempted from tariffs

### **5** CO2 abatement:

expected MIN

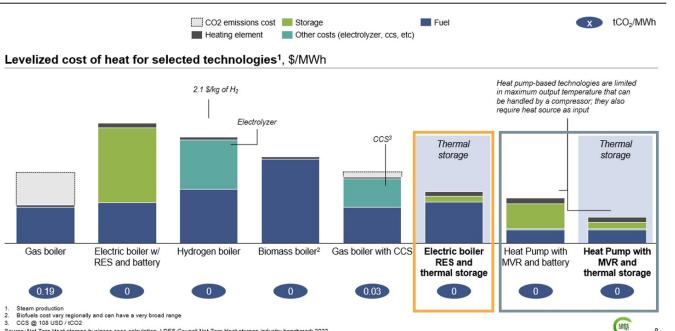
Value for our client's to source green



## Thermal storage is cost competitive with fossil heat when including carbon tax or at low electricity costs



### McKinsey/LDES: Comparing the LCOH for fossil-based and renewable solutions



#### Heatcube

- Able to serve medium to high temperature industrial heat demand
- Gives access to lowest possible power prices

#### Heat pump technologies

- Limited in maximum output temperature (low temperature heat)
- Heat source as input

Source: Net Zero Heat storage business case calculation, LDES Council Net Zero Heat storage industry benchmark 2022





# H1 2022 Financial highlights

# Key financial highlights

Key financial highlights

**EUR 1.4m** 

Investment in Heatcube<sup>™</sup> technology **EUR 6.9m** 

Cash position 30.06.22

EUR -3.0m Net loss 30.06.22 **EUR -3.3m** 

Cash from operational activities

Changed functional currency from NOK to EUR

### The funds has been allocated to:

- Building and installation of Heatcube™ at Nordjyllandsværket
- Organization has tripled during the first half of 2022
- Expansion of footprint, established Kyoto Technology Denmark and in the process of establishing Kyoto Technology Spain
- Acquiring of Mercury Energy in Spain
- Investment in development of next generation Heatcube™





# H1 2022 Operational highlights

# Nordyllandsværket Heatcube™ project progress

Building permits received, tanks arrived in Denmark, equipment will arrive within Nov, commissioning Jan 2023

- Slight delay of equipment due to current geopolitical situation but manageable impact.
- Commissioning scheduled for January 2023, vs previously communicated Q4 2022.



Illustration: Friis & Moltke Architects











# Leadership established to embark on scale-up phase

Solid industry & scale-up experience



Camilla Nilsson

Chief Executive Officer







Bjarke Buchbjerg

Chief Technology Officer





Tim de Haas

Chief Commercial Officer







Peter Iversen

Chief Manufacturing Officer







Susanne Vinje

Chief Supply Chain Officer





Agnieszka Sleds

Chief Project Officer



Henrik Holck-Clausen

Chief People & Culture Officer











# Organization has tripled

CEO Camilla Nilsson



29 Employees
spread over
3 Countries divided
on 11 nationalities with
an average of 13 years
of experience and
36% females and world
leading molten salt
engineering expertize



# **Established Kyoto Technology Spain**

Acquisition of Mercury Energy completed Aug 10th



# Serving increasing demand for thermal energy storage in Europe

- Acquisition Mercury Energy enables successful establishment of new business unit in Spain
- Expansion of Kyoto's geographic footprint close to key markets in Europe for rollout of and after-market services of Heatcube™



## Strengthening capacity and expertise

- Mercury Energy brings significant IPR for molten salt thermal energy
- Addition of several molten salt experts to our growing team





# Reference of the Kyoto Heatcube™ technology

A Solar Thermal Power Plant is a large facility for energy generation that uses the sun's energy to produce electricity. Many of them can store solar energy in the form of heated molten salt for off-peak hours, allowing for electricity production into the night when the sun is not shining. Molted salt as a storage medium is proven in the world and is used already for more than 20 years.

### Solar thermal power stations in the world: Operational - 57 With a storage capacity - 28 Announced & under construction for future use - 21 Process scheme 2 The sunlight is reflected that superheats a circulation of salt 5 Cooled salt is collected and sent through the 1 An array of mirrors is used to concentrate and reflect 3 The heated 4 The steam salt is pumped generating electricity

#### Gemasolar Thermosolar Plant – one of the oldest solar power plants in the world

Nominal Capacity 19MW CT
Storage capacity - 15h of molten salt storage
The efficiency of the cycle - 40%
Location - Spain, Sevilla
Start of operation - 2011
Achievements:

- Total operation is 6,450 hours at full capacity per year
- Prevention of about 30,000 tons of CO<sub>2</sub> emissions per year.



#### Noor Ouarzazate Solar Complex - the world's largest concentrated solar panel project

Nominal Capacity - 580MW CT
Storage capacity - 17h of molten salt storage
Location - Morocco
Start of operation - 2016
Achievements:

- CO2 reduction 730,000 tons per year
- Replacing of 2,5 million tons of oil



# **Kyoto Technology Denmark ApS**

Kyoto Technology Denmark established in May 2022

- The country in the world with the highest proportion of wind energy
- Average intraday volatility (lowest 4 hours vs base price) during H1 2022:
  - 59 EUR/MWh in DK1 and
  - 65 EUR/MWh in DK2
- Kyoto's first revenue generating market (Q1 2022)
- Led by Peter Iversen, 20+ years of significant industrial experience









Peter Iversen



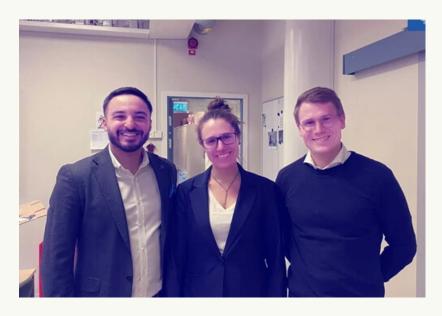




## Scale-Up + Sciences collaboration with KTH

The Royal Institute of Technology in Stockholm





- A one year post-doc collaboration RIHOND (Renewable Industrial Heat on Demand) was kicked-of in June 2022
- Financed by Kyoto, led by Silvia Trevisan (KTH) and supervised by Bjarke Buchbjerg (Kyoto) and Rafael Guédez KTH)
- Focusing on research and material development for the Kyoto Heatcube™ technology



# **Long Duration Energy Storage (LDES)**

#### LDES startups



cellcube

ENERGYDOME

















ceres







ENERVENUE



ENLIGHTEN













HEATRIX

































#### **Anchors**

#### Industry and services customers

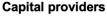


Google













#### **Equipment manufacturers**



Sumitomo









### Low-carbon energy system integrators & developers

















Upcoming: Release of Report "Net Zero Heat" at COP27 in Sharm El Sheik, Egypt Nov 6th-18th



The LDES Council is an independent body with its own governance structure, with the mission to accelerate energy decarbonization through the scale-up of LDES



Membership overview as of July 13 2022

## **Kyoto selected Top 50 Impact Companies in Nordics 2022**

To be presented in Copenhagen Sep 14th-15th



## IT'S ALL ABOUT CONNECTING THE RIGHT ONES

The One Initiative is a bold ambition.

We believe, that it is possible to use the forces of the market as a powerful driver towards a sustainable future. We want to make it happen.

United Nations' figures show, that it is possible to achieve the 17 global sustainable development goals by 2030 if roughly one percent of global investments are invested in sustainable solutions.

That's a lot of money – yes. But it is also just *one* percent. We just need to invest a *little* bit less in consumption and a *little* bit more in solutions.

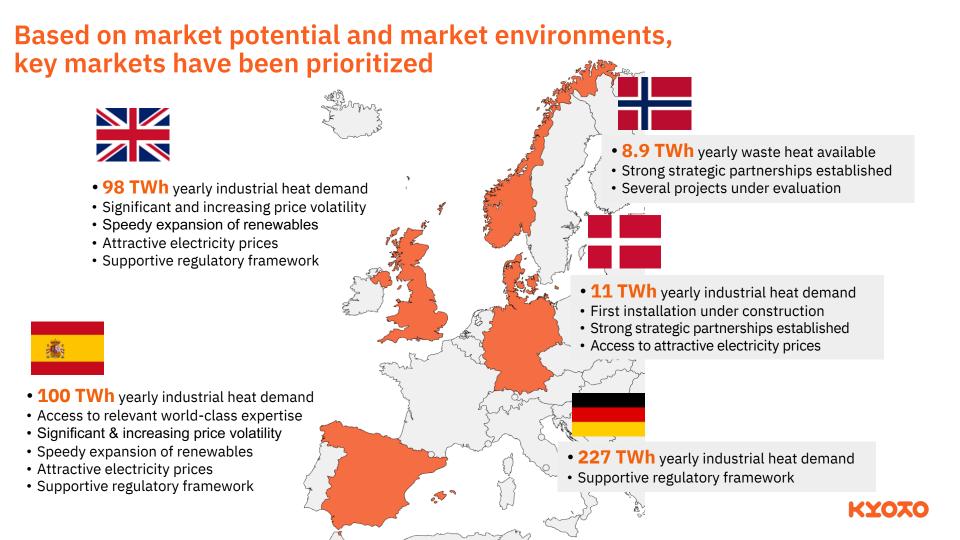
That's why our ambition is to identify, analyze and mature the most promising solutions of tomorrow and connect them with one percent of the capital of today.







# 1H 2022 Commercial highlights



## **Kyoto Group offers the Heatcube™ with two commercial models**

A

## **Heat as a Product (HaaP)**

## **Traditional Product Sale**

- EPC or direct sales
- Support and service agreements with customers
- One-time payments

В

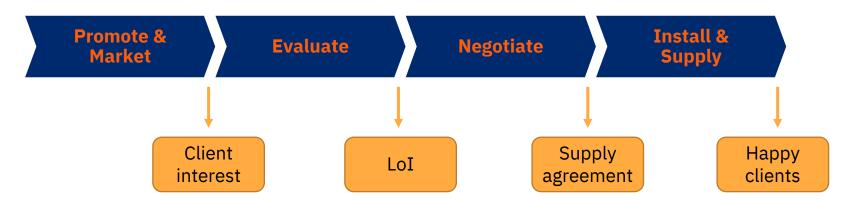
## **Heat as a Service (HaaS)**

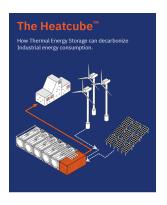
## **Heat Sales to Customers**

- Heat purchase agreements (HPA)
- Operated by Kyoto
- Recurring stable, long-term revenues



# Kyoto currently strengthens the commercial team to adequately respond to the increased market demand





### **Current focus:**

- Expand the commercial & project team to respond to market's demand
- Increase awareness of Heatcube™ as solution in the energy transition
- Shorten the sales cycle with advanced marketing and networking
- Provide solution offering to interested clients
- Finalize supply agreements



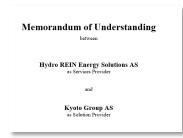
# Kyoto Group & Hydro REIN sign MoU to develop combined renewable energy & thermal energy storage solutions for industrial players



- Agreed on a joint go-to-market approach to industrial clients:
  - Hydro REIN offers guaranteed renewable energy
  - Kyoto Group's Heatcube™ offers renewable heat
  - Kyoto Group will co-design the solution and participate in serving the clients
- Target of 3 to 5 pilot and commercial projects over the next two years with identified clients



- Guaranteed renewable energy and heat on demand
- For industrial clients to decarbonize and optimize both their energy consumption and heat demand







## **Kyoto Group AS and Glomma Papp AS have signed a Letter of Intent (LoI)**

### **Status:**

 Technology and benefits of Kyoto's Heatcube<sup>™</sup> have been discussed and evaluated for several months

### Now:

Entering into negotiations of supply agreement

### Goal:

Commissioning during the summer of 2023

## **Background on Glomma Papp:**

- Designing, developing, and manufacturing packaging and display solutions for business markets since 1931
- Glomma Papp AS's vision is to inspire and improve

"This is further proof of our commitments to sustainability and to reducing CO2 emissions from our processes and actively being a part of the green transition for the corrugated industry. Kyoto's Heatcube™ offers an interesting potential for us [...]"



emballasje og display









# The Heatcube™ creates value and supports the decarbonization for industrial players in various industries



#### Paper, pulp and print

Heat is used to dry the pulp and heat the calendar rolls. It is also needed for recycled newsprint, specialty papers and packaging.



#### Chemical and petrochemical

Most of the heat is used for ammonia production by steam reforming of natural gas, steam cracking of naphtha and steam cracking of gas oil.



#### Food

Cooking, preheating, washing and pasteurization are the main areas for heat demand. A big share of energy is also used for refrigeration.



#### Iron and steel

Steel production requires very high temperatures to heat and melt iron ore. We can save a lot of energy by pre-heating the production parts.



#### Non-metallic minerals

Most of the heat demand in the sector comes from cement production and requires temperatures of over 400°C.



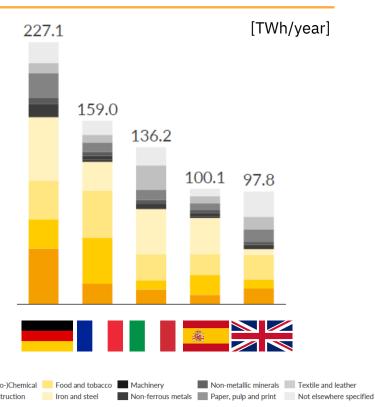
#### Non-ferrous metals

Heat is used almost entirely in specific electrical processes. It is required mostly in the aluminum, copper and zinc production.



# To increase the awareness and knowledge about the potential of electrification of industrial process, the report is accessible here:

## Industrial heat demand in....

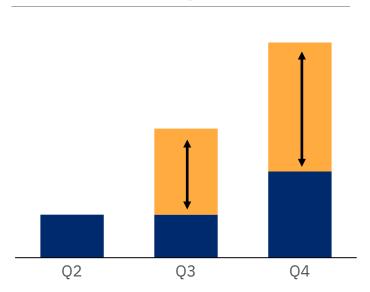






# Kyoto Groups receives continuously increasing requests and projects to sign 5-10 LoIs during 2022...

## Projected LoIs during 2022



- Negotiating and signing 5-10 LoIs
- Entering into final negotiations of supply agreements
- Securing installations of several Heatcube™ during 2023

.... to support the industry decarbonizing their heat demand, lowering their energy expenditures and securing steady supply







We disconnect the time power is made, from when it is used



# Appendix



## P&L

### All figures in EUR (unaudited)

	Note	H1 2022	H1 2021
OPERATING INCOME AND OPERATING EXPENSES			
Employee benefits expense	1	1 196 580	694 829
Other expenses	1	1 847 915	900 655
Total expenses		3 044 495	1 595 484
Operating profit		-3 044 495	-1 595 484
FINANCIAL INCOME AND EXPENSES			
Interest income from group companies		47	0
Other interest income		322	3 988
Other financial income		19 678	2 959
Other interest expenses		2 166	478
Other financial expenses		2 381	977
Net financial items		15 500	5 492
Net profit before tax		-3 028 994	-1 589 993
Income tax expense		0	0
Net profit after tax		-3 028 994	-1 589 993
Half-year result	3	-3 028 994	-1 589 993



# **Balance sheet**

All figures in EUR (unaudited)

	Note	30.06.2022	30.06.2021
ASSETS			
Non-current assets			
Intangible assets			
Research and development	8	4 396 222	1 034 525
Deferred tax assets		0	507 568
Total intangible assets		4 396 222	1 542 093
Property, plant and equipment			
Equipment and other movables	8	8 235	8 3 7 8
Total property, plant and equipment		8 235	8 378
Non-current financial assets			
Investments in associated companies	2	5 414	0
Other long-term receivables	6	73 831	372 816
Total non-current financial assets		79 245	372 816
Total non-current assets		4 483 702	1 923 288
Current assets			
Debtors			
Other short-term receivables	6	306 049	356 887
Receivables from group companies	7	9 881	0
Total receivables		315 931	356 887
Cash and cash equivalents	4	6 859 973	15 621 769
Total current assets		7 175 904	15 978 656
Total assets		11 659 605	17 901 944

	Note	30.06.2022	30.06.2021
EQUITY AND LIABILITIES			
Equity			
Paid-in capital			
Share capital	3	25 290	24 835
Share premium reserve	3	10 141 129	16 105 268
Other paid-up equity	3	328 078	1 040 903
Total paid-up equity		10 494 497	17 171 006
Total equity		10 494 497	17 171 006
Liabilities			
Other non-current liabilities			
Other non-current liabilities	9	231 918	235 949
Total non-current liabilities		231 918	235 949
Current liabilities			
Trade payables	6	357 878	353 612
Public duties payable	6	189 856	86 834
Other current liabilities	6	385 456	54 542
Total current liabilities		933 190	494 988
Total liabilities		1 165 108	730 937
Total equity and liabilities		11 659 605	17 901 944



# **Cash flow**

All figures in EUR (unaudited)

	H1 2022	H1 2021
CASH FLOW FROM OPERATING ACTIVITIES		
Profit/loss before tax	-3 028 994	-1 589 993
Impairment of fixed assets	0	2 949
Change in accounts payable	-348 516	63 514
Change in intercompany balances	-99 458	0
Change in other accrual items	207 365	92 903
Net cash flow from operating activities	-3 269 603	-1 430 626
CASH FLOW FROM INVESTMENT ACTIVITIES		
Investments in subsidairies	-5 414	0
Payments to buy intangible assets	-1 377 768	-530 771
Net cash flow from investment activities	-1 383 182	-530 771
CASH FLOW FROM FINANCIAL ACTIVITIES		
Change in convertible debt	0	-221 202
Proceeds from equity	21 522	17 122 507
Sale of own shares	0	649 899
Purchase of own shares	-22 962	0
Currency adjustments	-258 594	-784
Net cash flow from financial avtivities	-260 034	17 550 420
Net change in cash and cash equivalents	-4 912 819	15 589 022
Cash and cash equivalents per 01.01.	11 772 792	32 746
Cash and cash equivalents per 30.06	6 859 973	15 621 768



# Key developments towards 2025 targets

Pilot test
 finalized and
 converted to

2021

 First commercial order signed

R&D center

- IPO
- Doubling of organization
- 2022 pipeline maturing

First commercial installation

2022

- Signing of several commercial orders, with large industrial companies
- Doubling of organization
- Explore M&A opportunities and financing

2023 - 2024

- Strong foothold in all strategic markets established
- Accelerating industrialization of the Heatcube™
- Developed next generation Heatcube Designed for Manufacturing and Assembly
- Continued growth and expansion of the organization
- Increasing focus on profitability, approaching break even

2025

- Several hundred batteries installed
- >GW and several GWh available
- Solid profitability
- LCoS < 20 EUR/MWh
- CapEx < 40 EUR/kWh
- A billion NOK revenue company

