



**Kyoto Group – the Heatcube**  
A thermal battery

November 8<sup>th</sup> 2022



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# Kyoto Group on a page

Founded in

**2016**

Listed on Euronext  
Growth in 2021

Employees



33 full-time  
employees

Located in



Lysaker, Norway

Scaling up



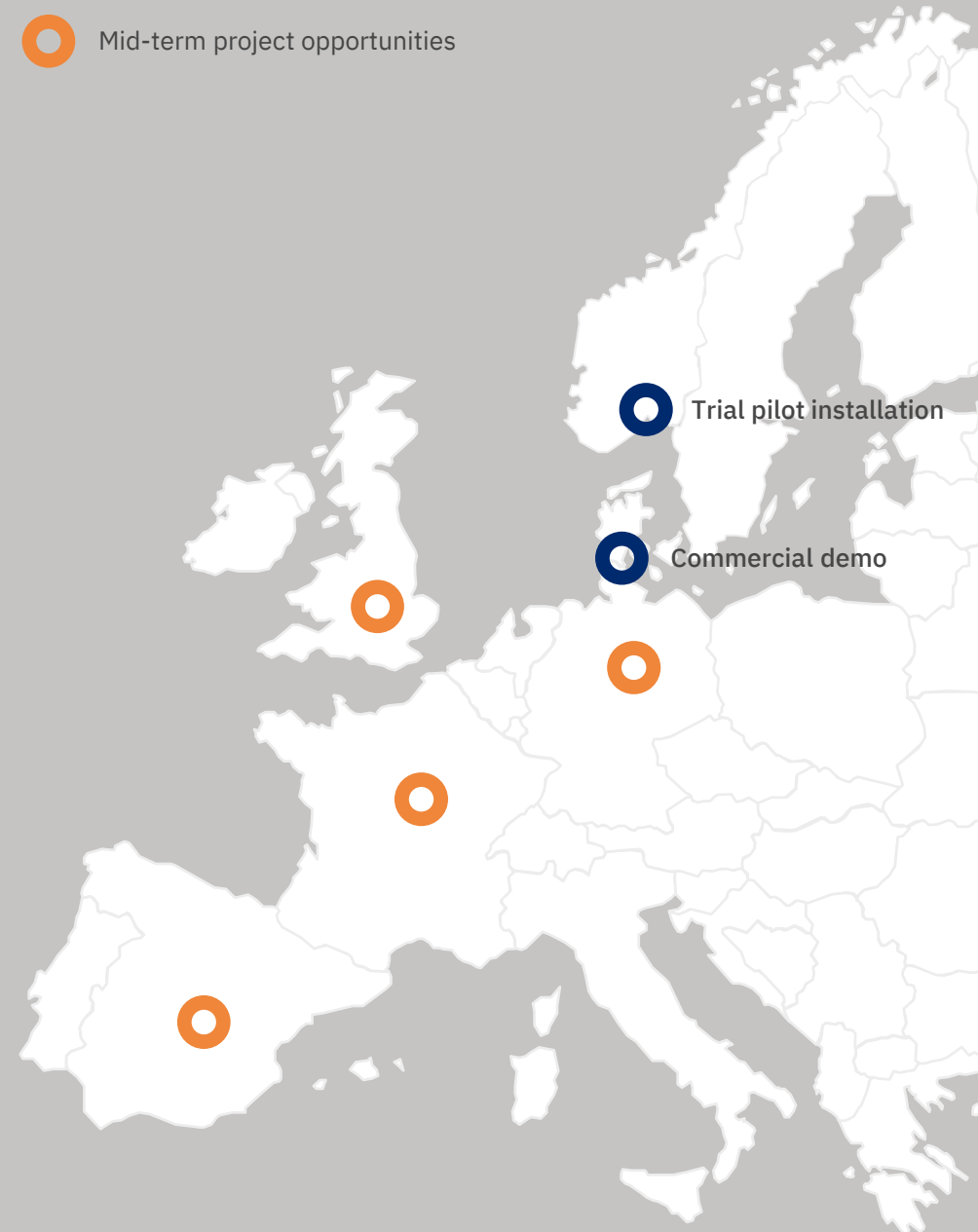
Aiming to become a  
billion NOK revenue  
company

# From start-up to scale-up

## At market break-through with proven technology

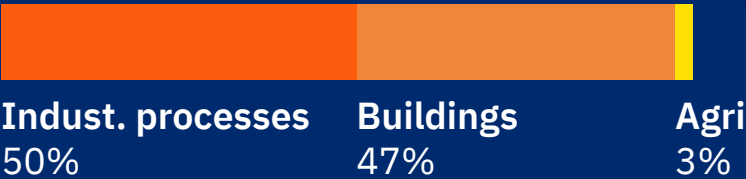


○ Mid-term project opportunities



# Heat accounts for half of global energy consumption

## Global energy demand



**89%**  
of heat produced by fossil and non-renewable fuel sources make up

**40%**  
of global CO<sub>2</sub> emissions

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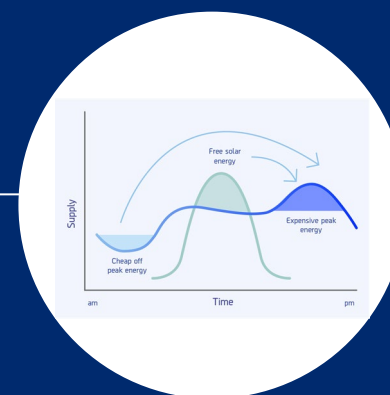
# Decarbonization impossible without energy storage



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: Unmatched supply and demand

OUR SOLUTION

# The Heatcube

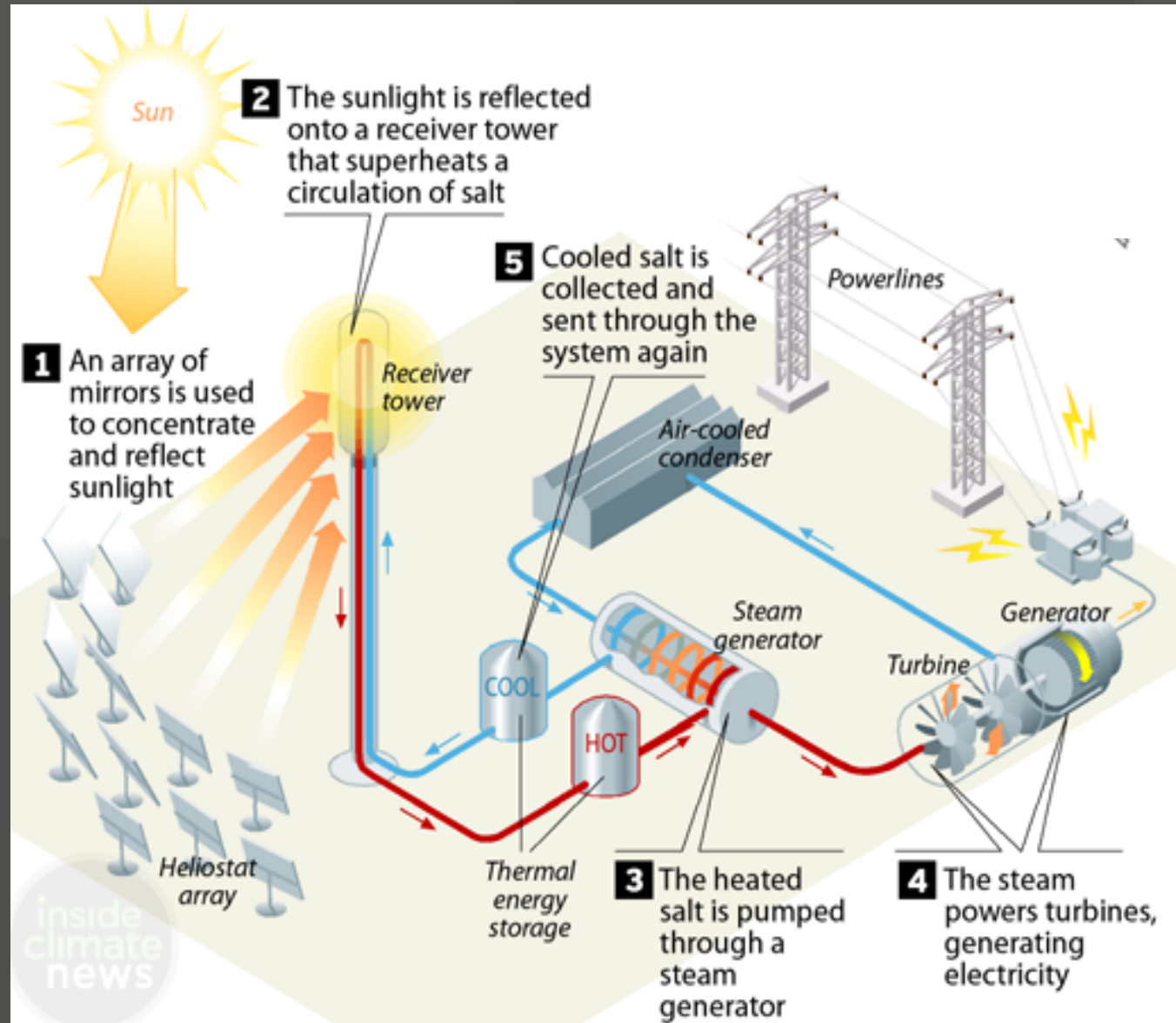
THE KYOTO ENERGY REVOLUTION

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# The origin of the proven Kyoto Heatcube™ technology

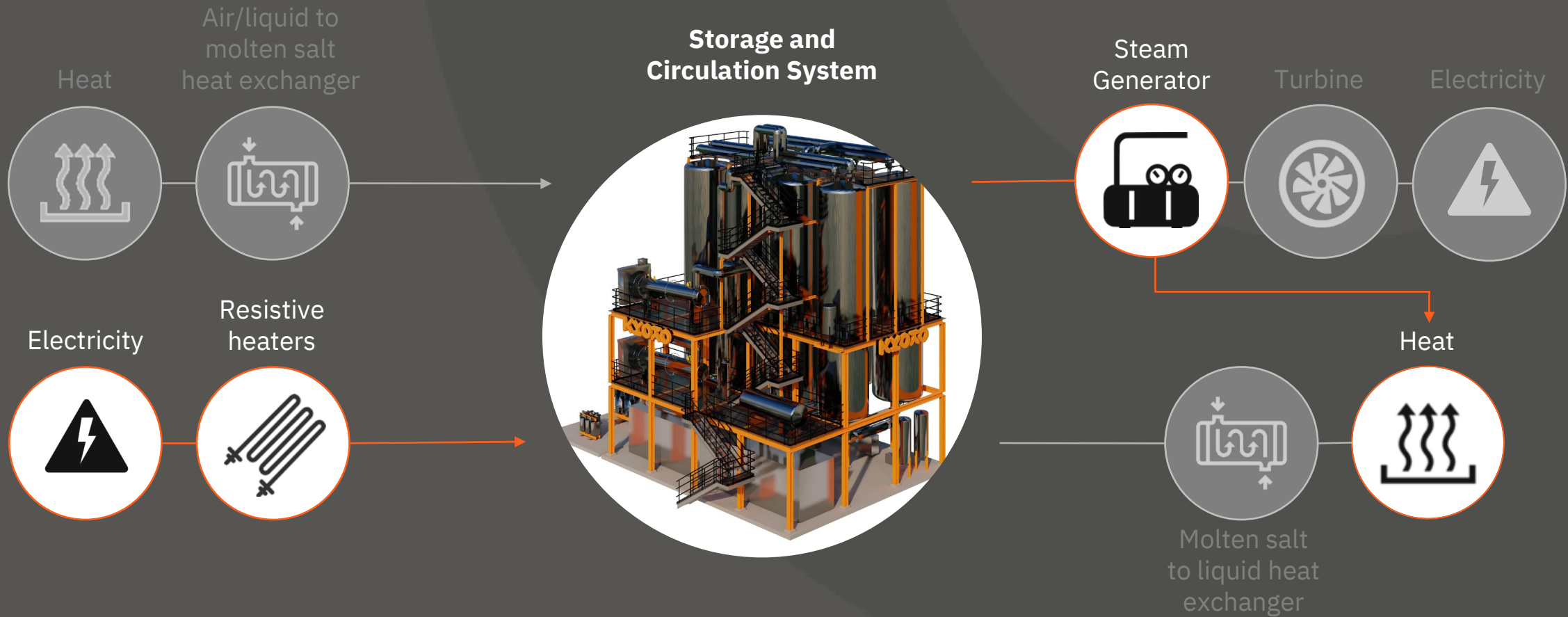
## Solar thermal power stations in the world

- Operational: 57
- With a storage capacity: 28
- Announced & under construction for future use: 21



# Modular applications of the Heatcube

Same product, multiple configurations drive flexibility and reduce cost





# Heatcube 2.0

## Key Metrics

- Charging capacity: 10, 20 or 30MW
- Storage capacity: 16 – 96 MWh
- Discharge capacity: up to 5 MW
  
- Discharge in form of steam: 170-415°C
  
- Lifetime 25 years
- RTE of more than 90%\*
  
- Storage time: long duration
- Less than 1 minute from standby to charge, discharge or simultaneous charge and discharge

Footprint: ~ 170 sq.m - 310 sq.m

Height: ~ 15m

Weight: ~ 400 MT – 1,500 MT

*\* Based on size, total heat produced and the ambient conditions of the specific area.*



HEATCUBE

# A thermal battery

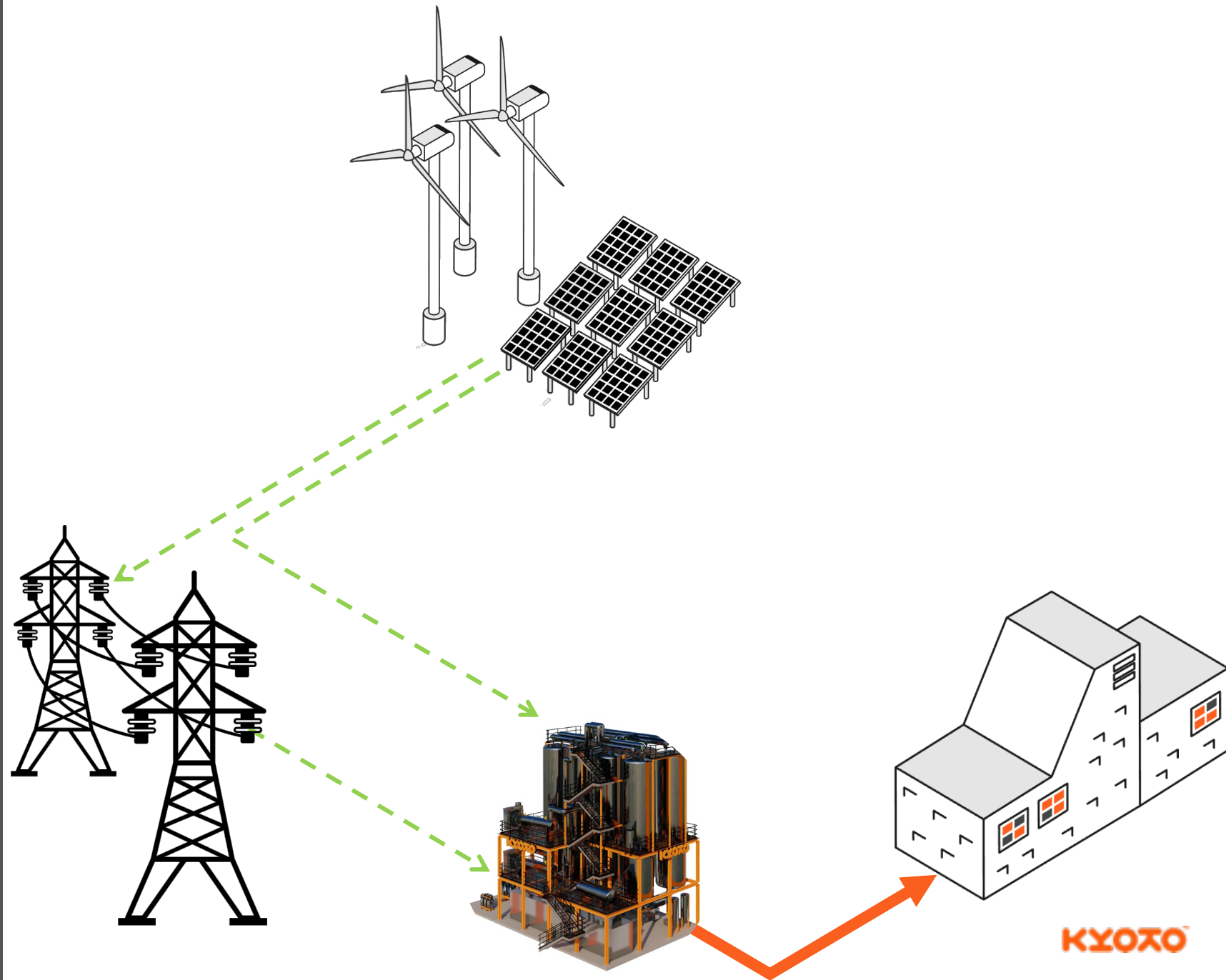
IN THE POWER MARKETS

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# Making green energy stable and reliable

## Power-to-Heat

- Storing grid / off-grid renewable power
- Delivering renewable heat whenever needed

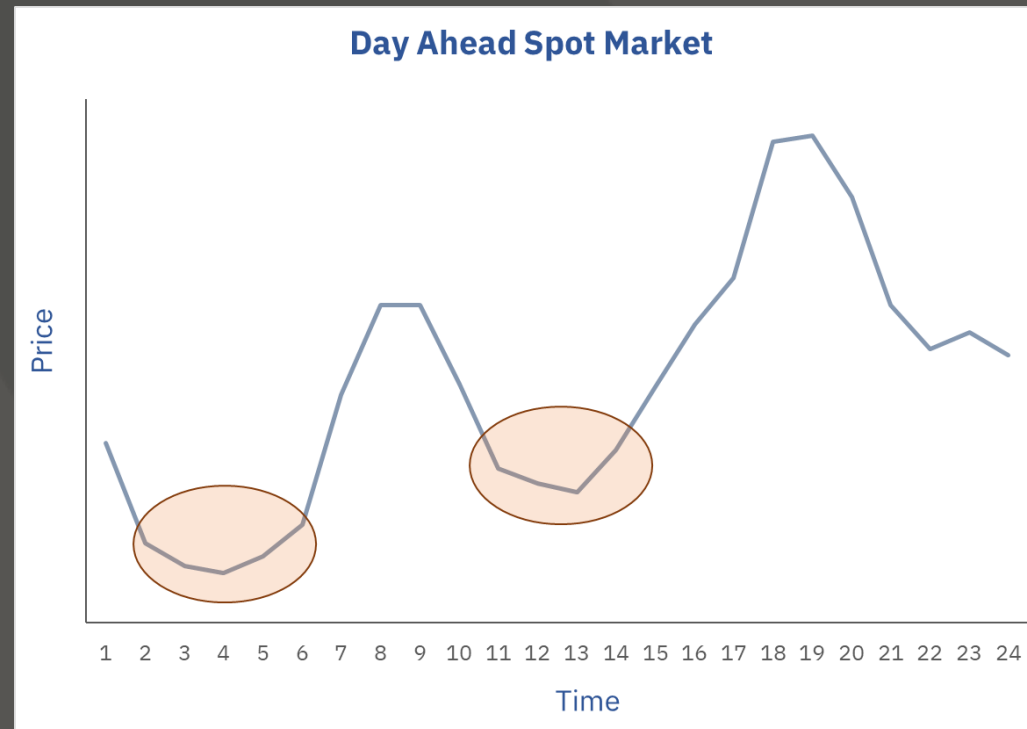


# Kyoto's Heatcube™ Power-to-Heat

enables industrial partners to benefit from increasing power price volatility

## Utilizing the volatility in the Day-ahead Spot Market

- Limiting charging to hours with low spot prices
- Delivering heat whenever it is needed

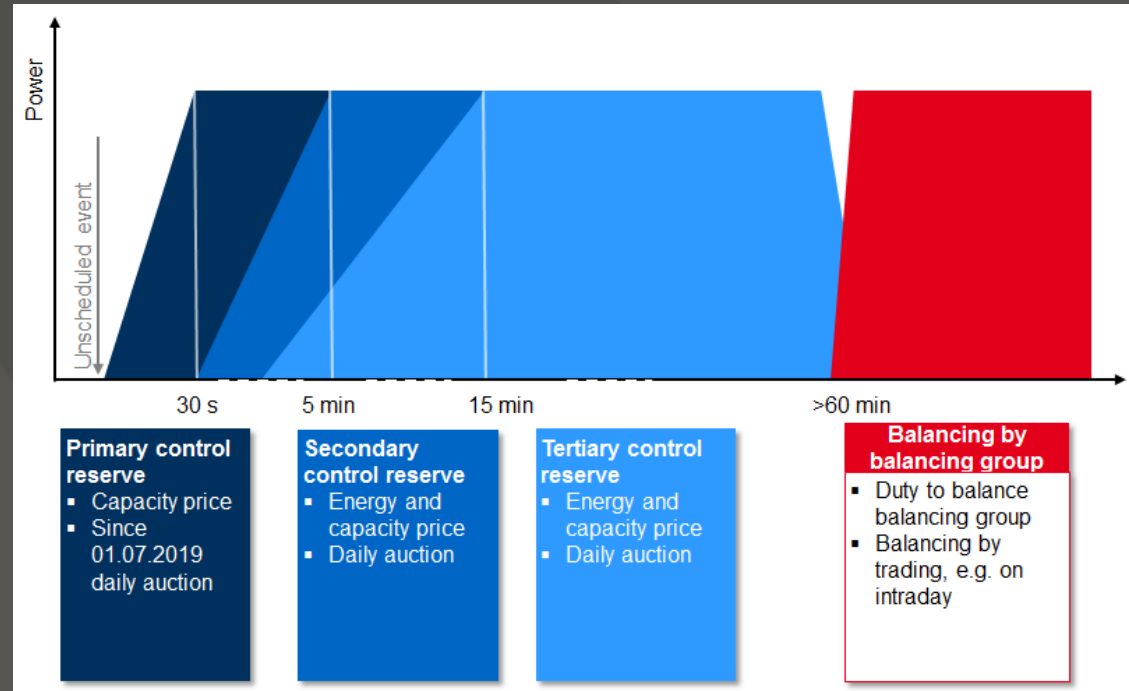


# Kyoto's Heatcube™ Power-to-Heat

enables industrial partners to benefit from balancing services

Participation in the reserve market and trading in the intraday market

- Increasing the flexibility in the system
- Balancing the intermittent renewable power production
- Additional revenue streams

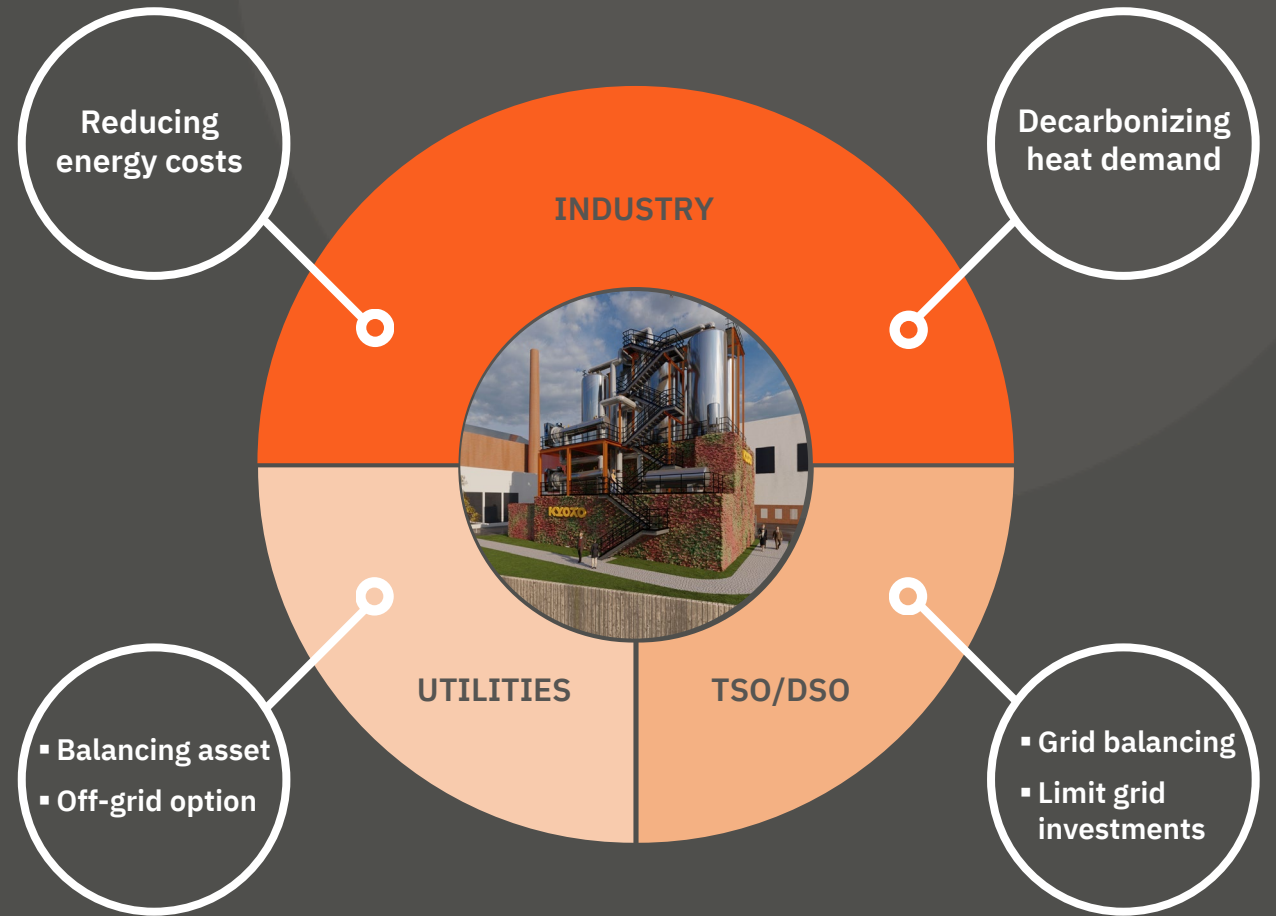


The HEATCUBE

# Creating value for the industry, utilities and TSO/DSOs

## Throughout the green shift

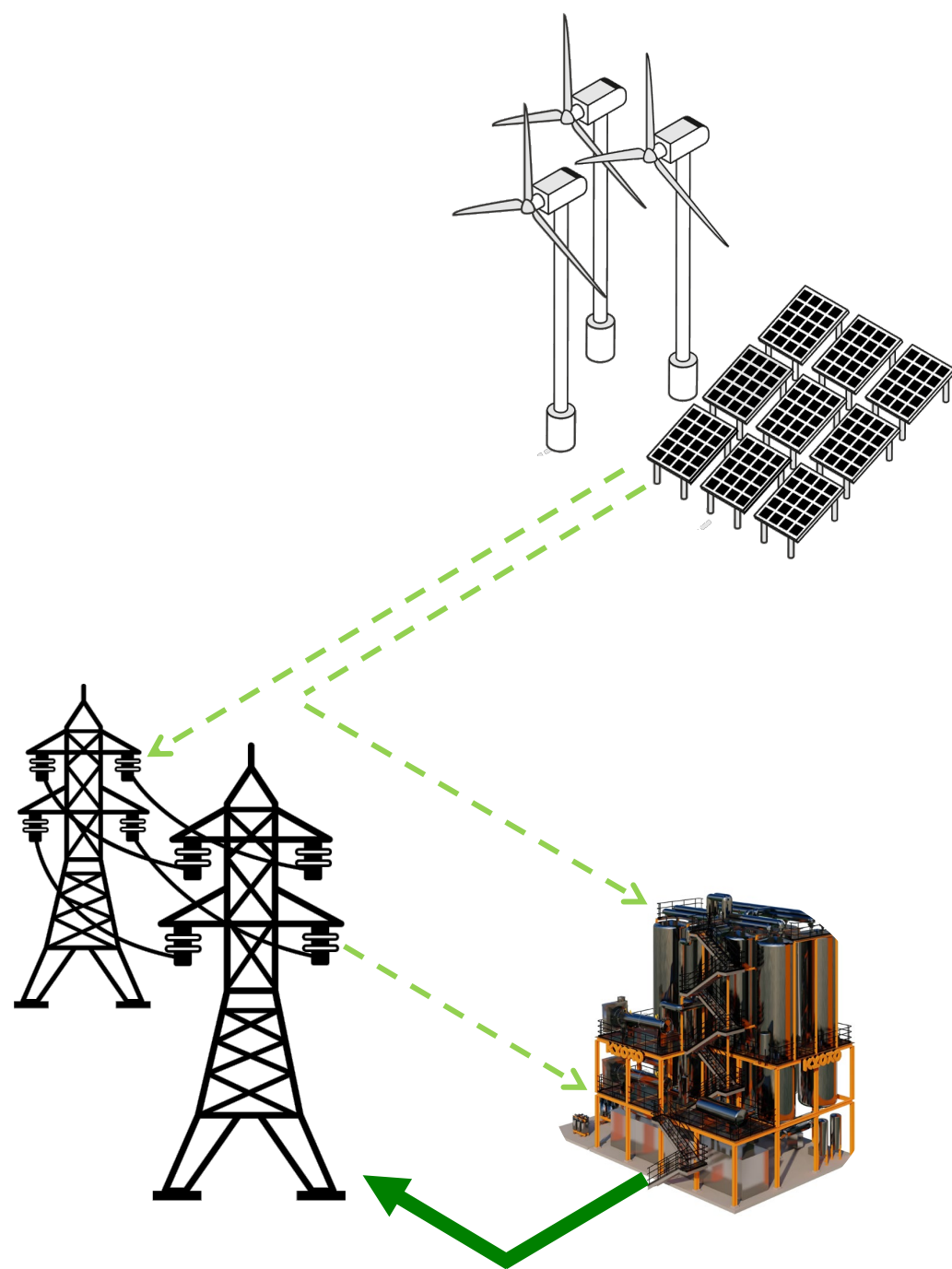
- Decarbonization of industrial heat
- Introducing flexible power demand



# Making green energy stable and reliable

## Power-to-Power

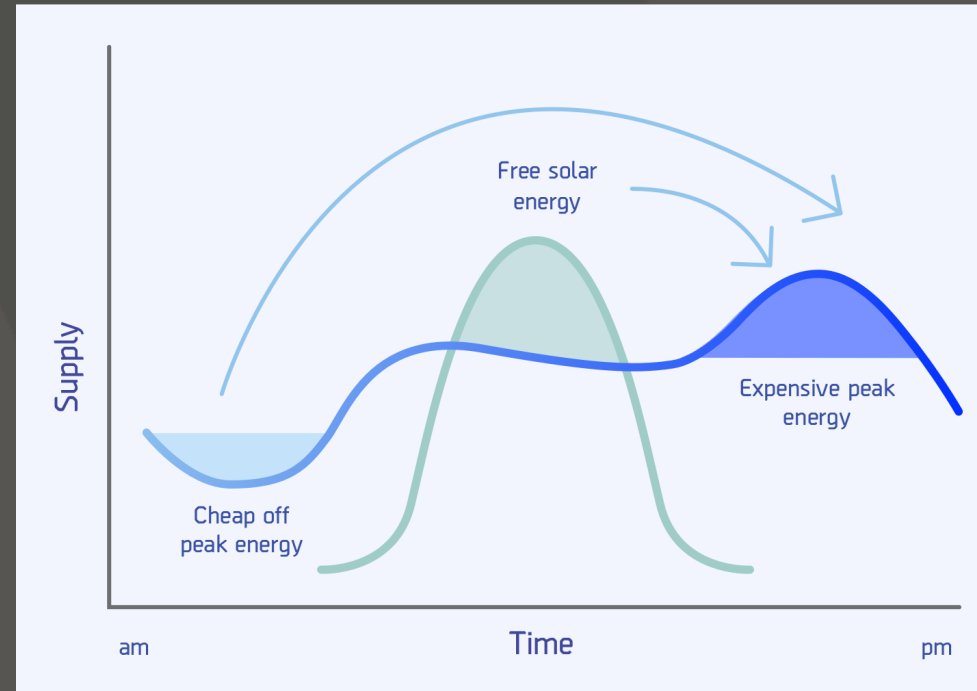
- Storing grid / off-grid renewable power
- Delivering renewable power to the grid



# Kyoto's Heatcube™ Power-to-Power

Balancing the system through power market arbitrage

- Day-ahead market
- Intraday Market
- Reserve Market



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Thank you for your attention!

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