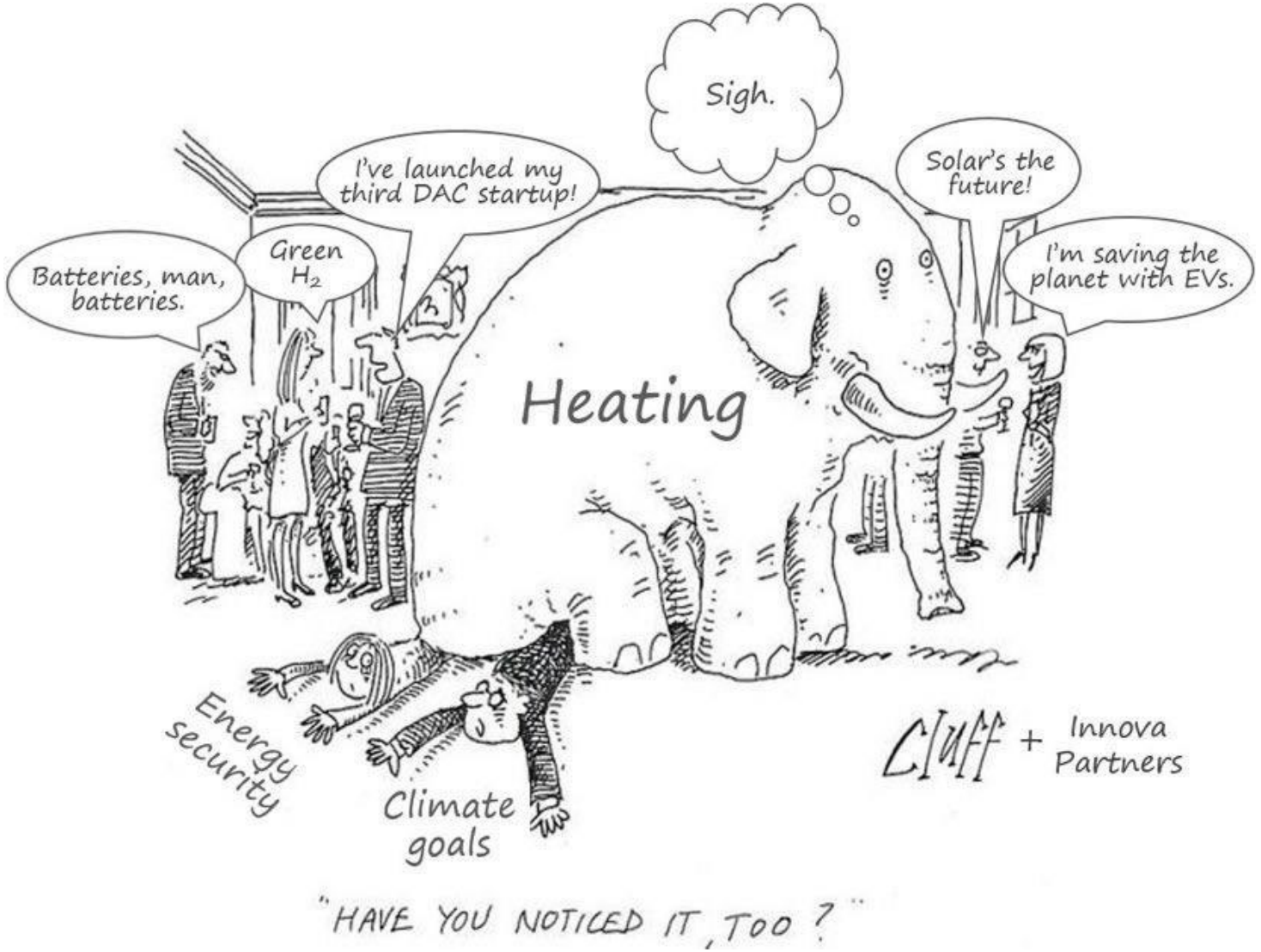
KRAFT
BLOCK

Green heat for Spanish industries

Unveiling Kraftblock's groundbreaking high-temperature energy storage solutions, enabling a sustainable transition towards a decarbonized future.

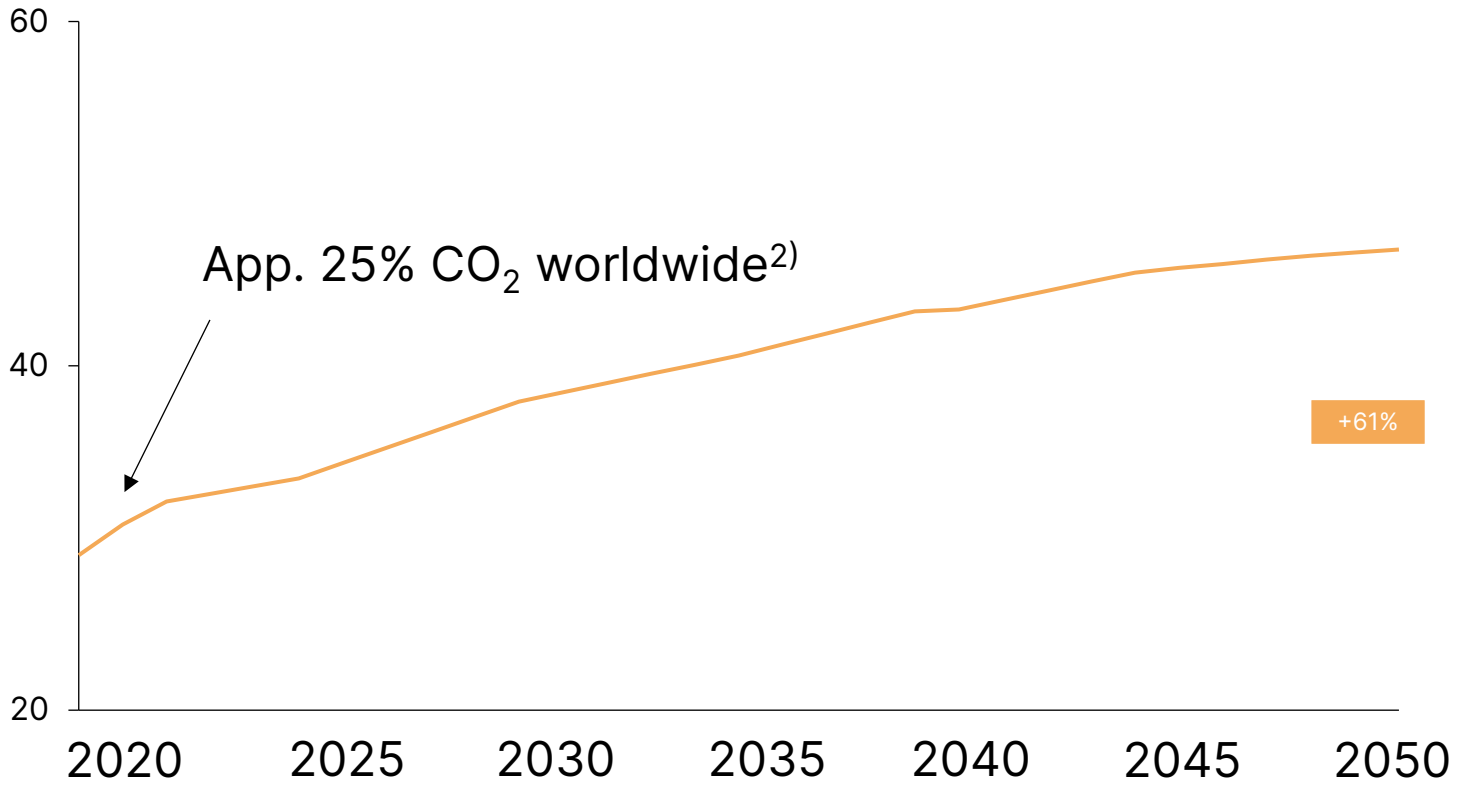
Heat – Elephant in the room

We need to start thinking about green heat



Energy in a global context.

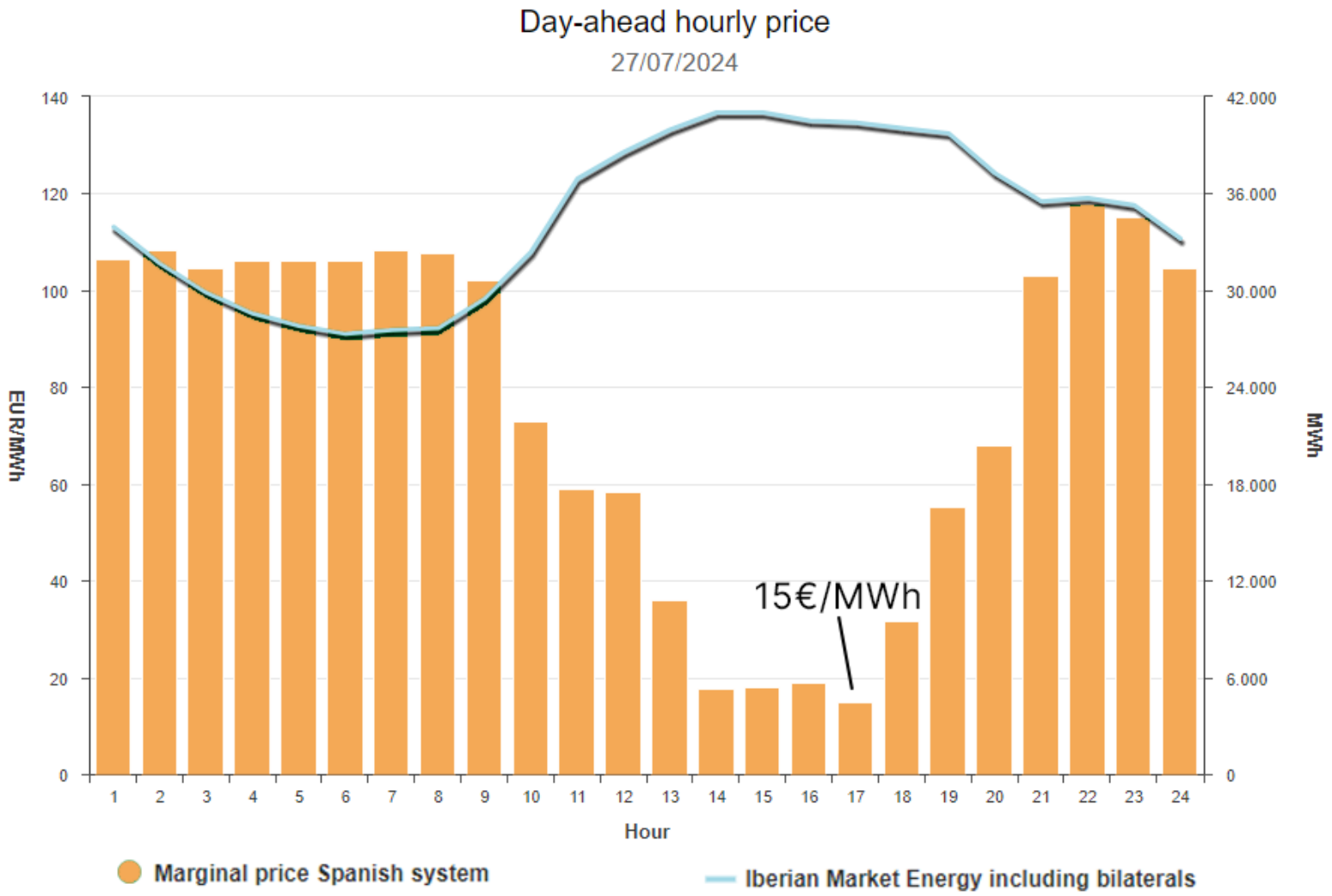
Industry Heat [PWh]



Heat in perspective

- Over 50% of the globally consumed energy is heat
- In industries process heat makes up to three quarters of the energy demand
- The future holds growing heat demand in industries

Spanish electricity market.



High volatility

- Many hours with low and even zero prices
- Creates opportunity for flexible loads
- Creates problems for suppliers and generators
- Requires a solution: storage

Source: omis.es

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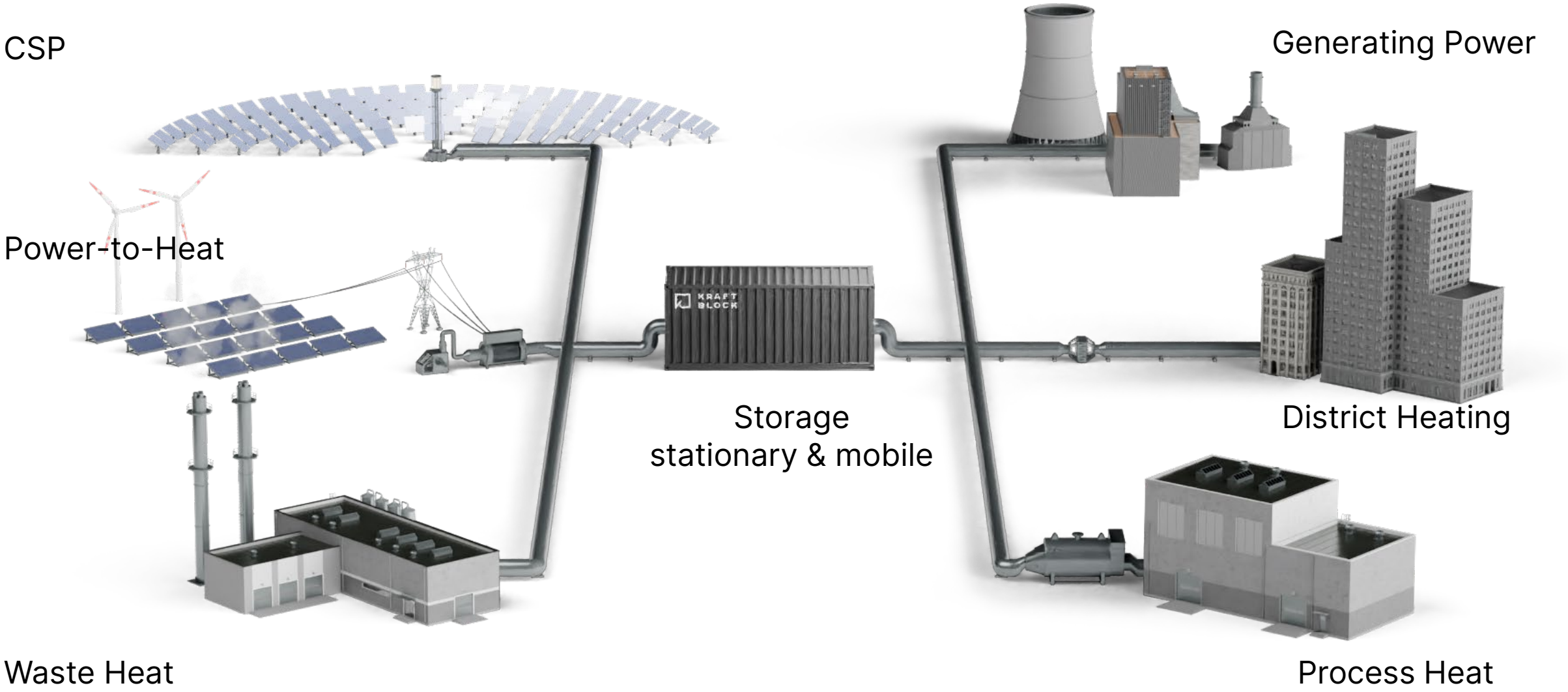
Storage innovation Kraftblock.

Overview of Applications.



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The storage cycle.

01
Charging

Hot air is blown through the storage. The storage material absorbs the heat.

02
Storing

Energy is stored between an hour and up to two weeks with minimal losses.

03
Discharching

Cold air takes the heat and leads it through the system to adapt temperature and heat transfer media.

Up to **1,300°C (2400°F)**

Sustainable, recycled material

96% **round-trip efficiency**

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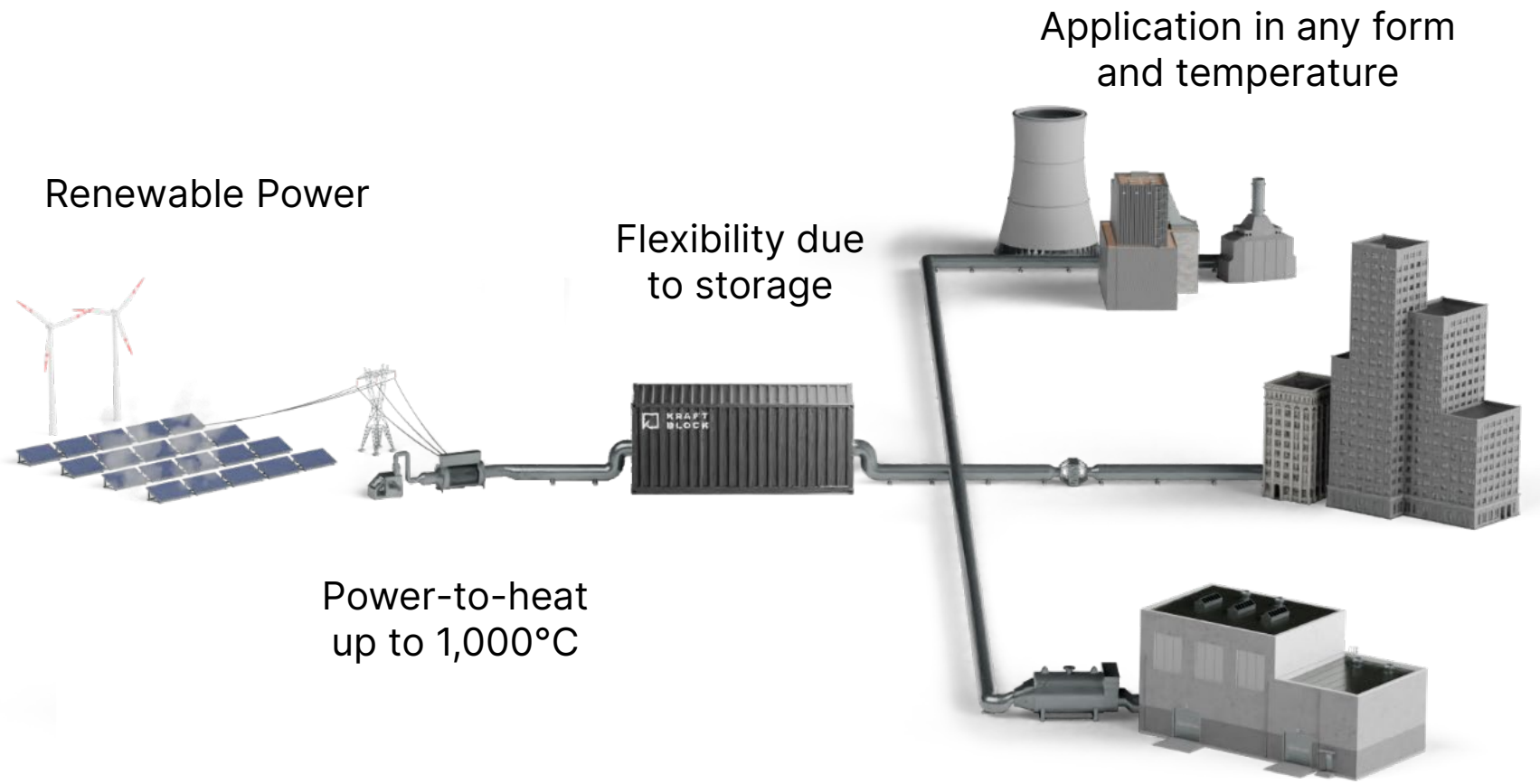
Net-Zero-Heat System.

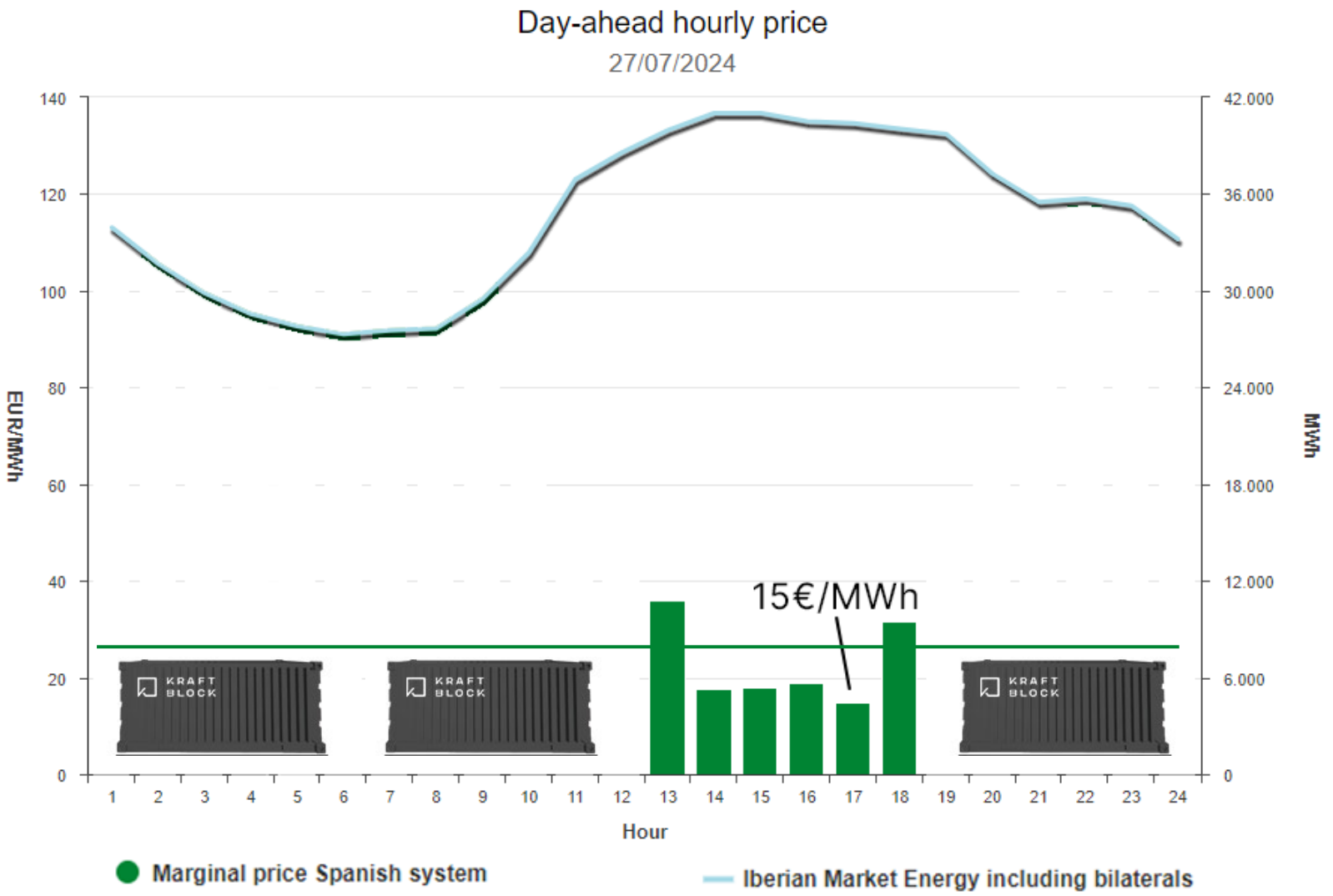
Net-Zero Heat System.



Advantages

- Prevent curtailment
- Relieve grid
- Use low power prices
- Replace fossil fuels

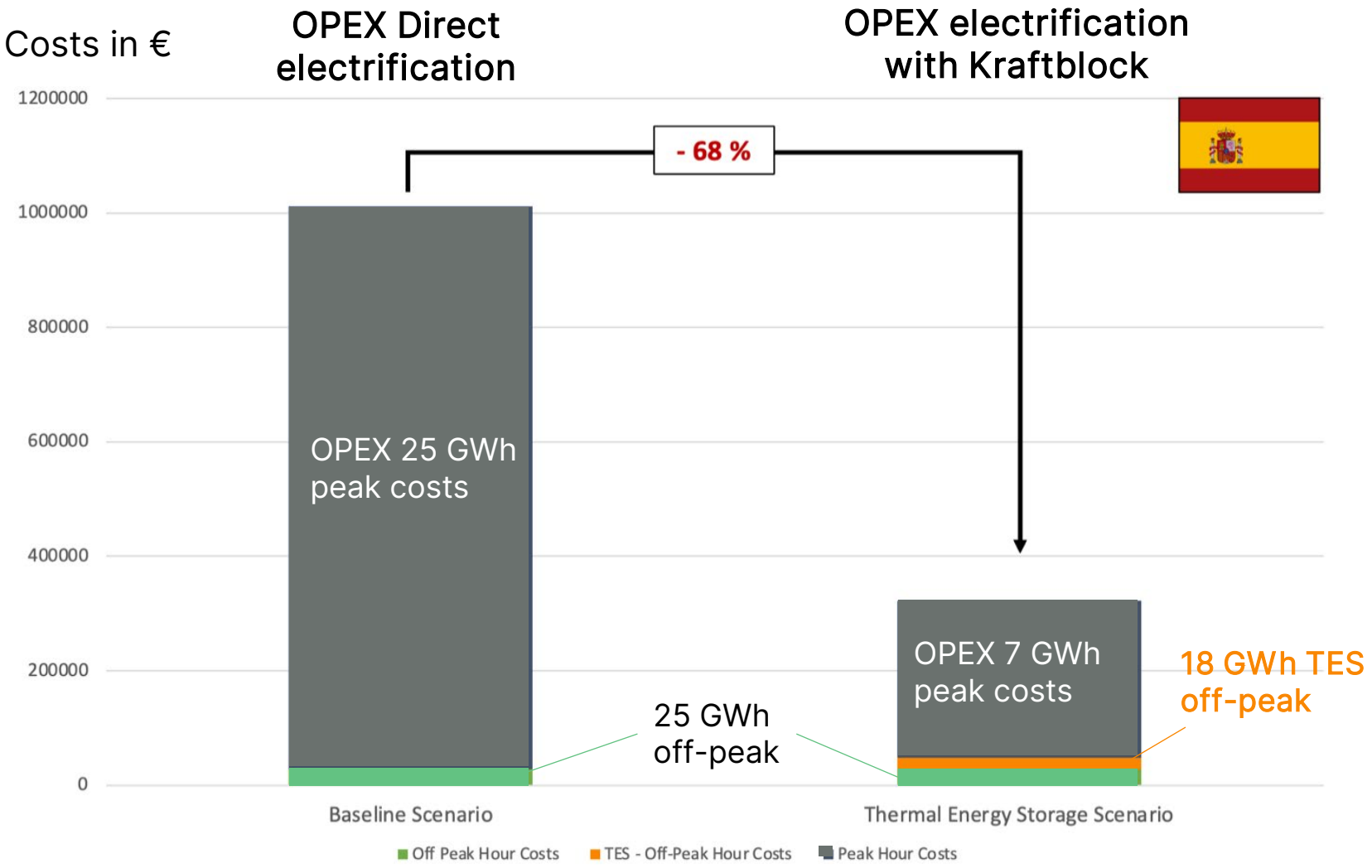
Exploit the low – beat gas prices.



Shift energy prices

- Load at low or negative price
- Use at high prices
- Benefit from the high flexibility of storage
- Significant OPEX reduction in comparison to direct electrification
- Can even beat gas

Flexibility offers cost reduction.



– Peak Ø 39.4€/MWh – Off-peak Ø 1.1€/MWh

Scenario

- Calculations based on wholesale prices March 2024
- Industrial customer 24/7 production,
  50 GWh energy per month,
  300 MWh storage,
  50 MW (dis-)charging
- Industrial load shifting:
  - Using negative prices
  - Avoiding peak prices

Volt project.

PEPSICO

Eneco

- Broek op Langedijk, NL
- 1 million bags of chips everyday
- For eight European countries
- Almost every emission in Scope 1 is burning gas for frying 24/7

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Replicability for the food industry

Dairy

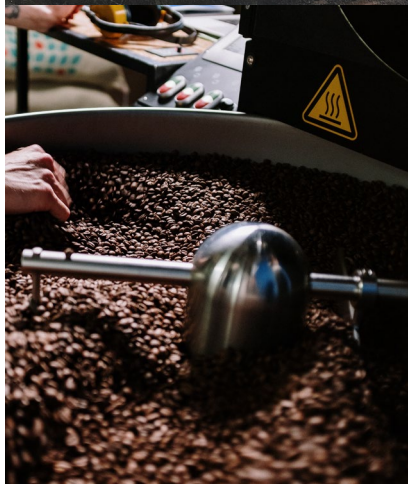
- Pasteurizing
- Sterilizing
- Constant Heat
- Cheese vat
- UHT

Sweets

- Baking ovens
- Tempering
- Cooking
- Preheating
- Sugar factories

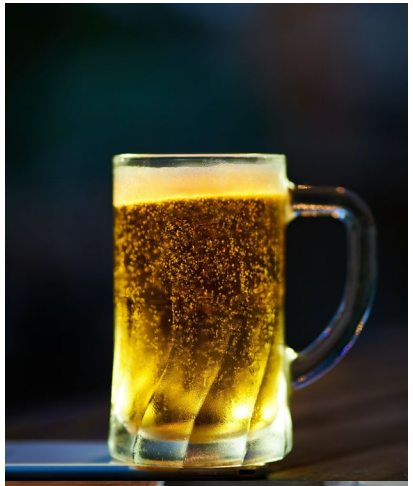
Meat

- Saturated steam
- Air drying
- Cooking
- Processing



Coffee & tea

- Roasting
- Drying
- Brewing



Alcohol

- Drying
- Mashing
- Destilling
- Wort boiling
- Malt making

Processed

- Frying
- Cooking
- UHT
- Pasteurizing
- Pet food

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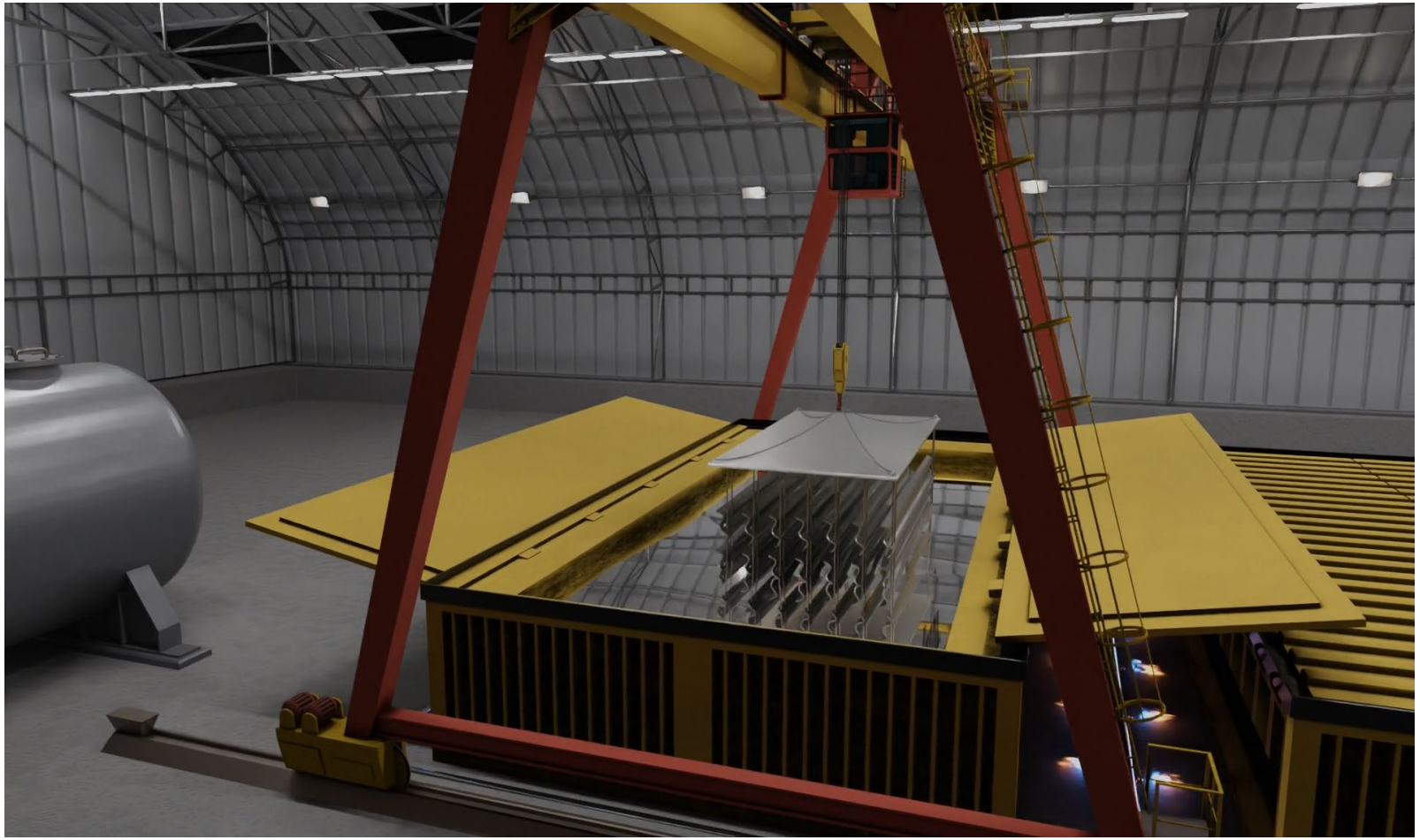
Use case: zinc coating



Zinc bath

- Protective coating for steel parts
- Permanent heating at melting point (600°C)
- Thus energy intensive application
- Natural gas is standard, but has disadvantages (burning through)

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Industries and target markets

Building materials

- Insulation material
- Stone wools
- Wood heat treatment
- Asphalt aggregate drying

Chemical sector

- Steam generation
- Fertilizer production, Drying
- Petrochemical (Rectification)
- Distilling

Pulp & paper

- Digesters
- Evaporation
- Limestone
- Optimisation power plant

Steel & metals

- Dozens of use cases in Steel
- Refining of Copper
- Aluminium (Bayer, Smelting)
- Metal processing (tempering, hot bending, foundries etc.)

Glass & ceramics

- Technical Ceramics
- Partial Furnace Electrification
- Recycling and scrap processes
- Drying processes

Energy in general

- District heating
- Power plant optimization (also H_2)
- Power plant retrofitting
- Oil & Gas (Flare gas)

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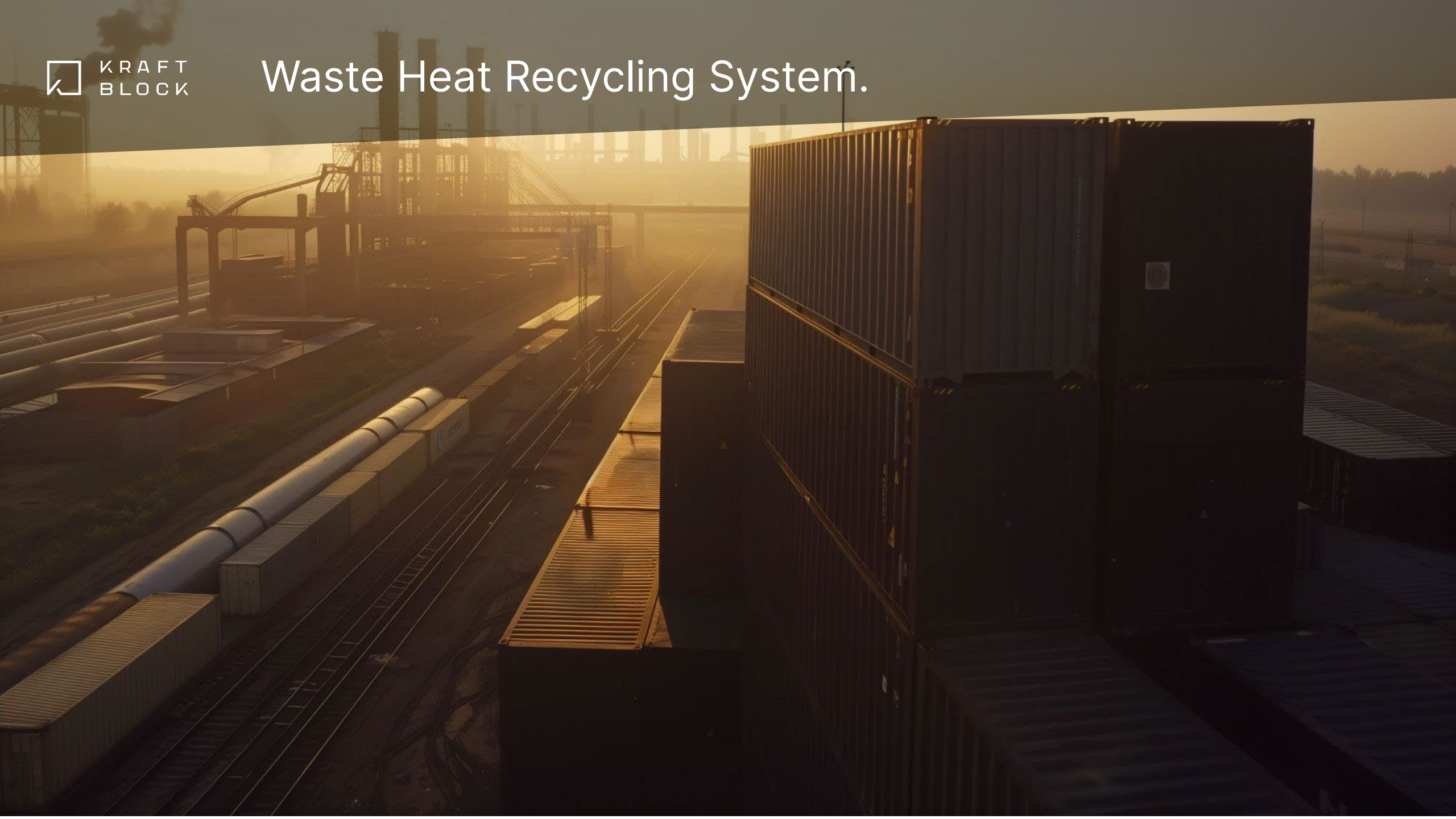
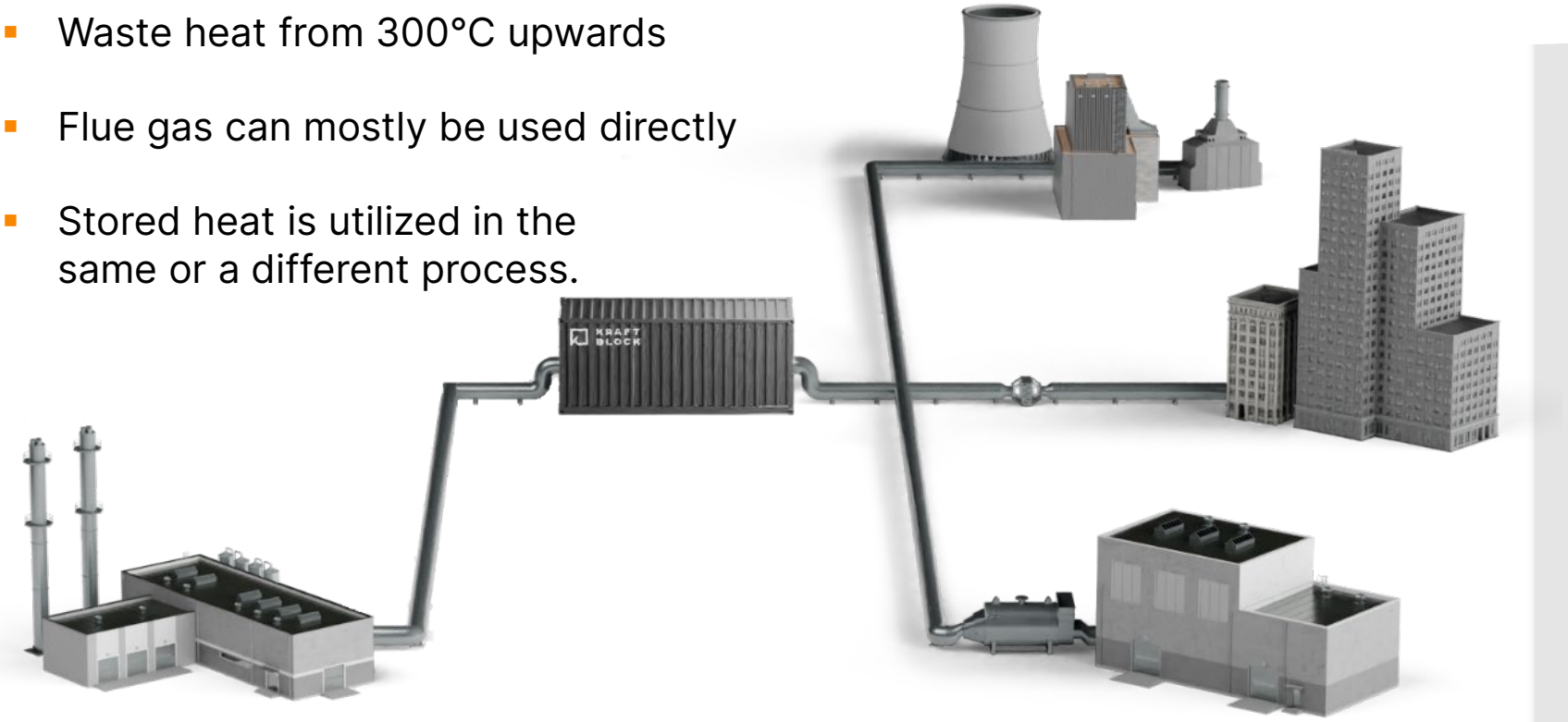
Waste Heat Recycling System.



Waste Heat Recycling System.

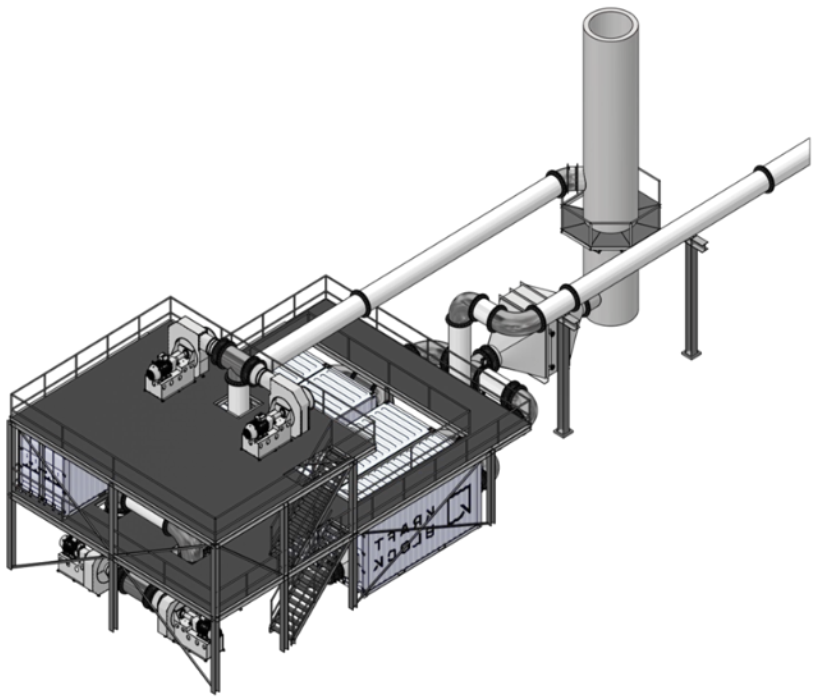
- Waste heat from 300°C upwards
- Flue gas can mostly be used directly
- Stored heat is utilized in the same or a different process.



Advantages

- Less primary energy needed
- Additional emissions avoided
- Cost savings
- No new energy source needed

Commercial project: Tata Steel.



TATA STEEL

- Installing: 2024 (Autumn)
- Capacity: 20 MWh
- Very fast payback
- 2% energy efficiency boost of sinter plant
- Location: Jamshedpur, India

About the project

- Collecting waste heat from the sinter plant
- Operation: Sintering
- Application: Hot water for the sinter mixting to save coke later in blast furnace
- 20,000t of CO_2 per year reduced

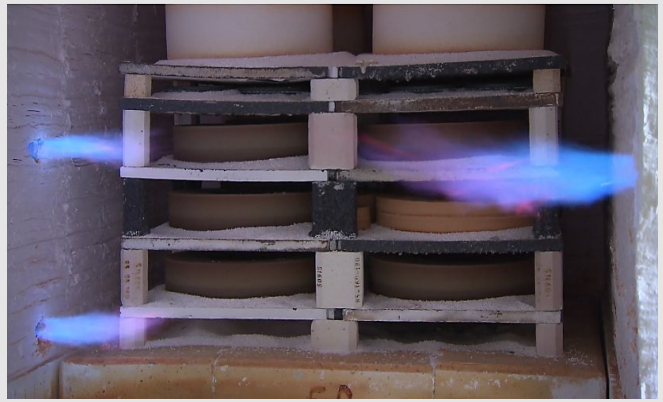
Pilot project: Comet.

COMET
Made for Perfection

Manufacturer of technical Ceramics (abrasive disks)

- Installed: 2020
- Capacity: 4.2 MWh
- Charging/Discharging: max. 300kw
- Location: St. Ingbert, Germany
- Savings: 330t CO_2/year

About the project



- Collecting waste heat from a gas-fired kiln and preheating the kiln on various occasions
- Replicable in many batch processes

Buhck: Making heat mobile

buhck GRUPPE

Waste recycler

- Recovering waste heat from a CHP in Hamburg
- Operation: Batch process
- Application: Substituting fossil fuels in industries, for construction drying, and more

Contact.

Contact

Christian Kissling
kissling@kraftblock.com
+49 6897 936 1616

General Contact

Kraftblock GmbH
Industriestraße 2
66280 Sulzbach/Saar
welcome@kraftblock.com

Phone: +49 6897 936 161
Fax: +49 6897 936 162
www.kraftblock.com