



# GREEN PROCESS HEAT FOR OUR INDUSTRIES

May 2023

**LUMENIX**  
GREEN ENERGY 24/7



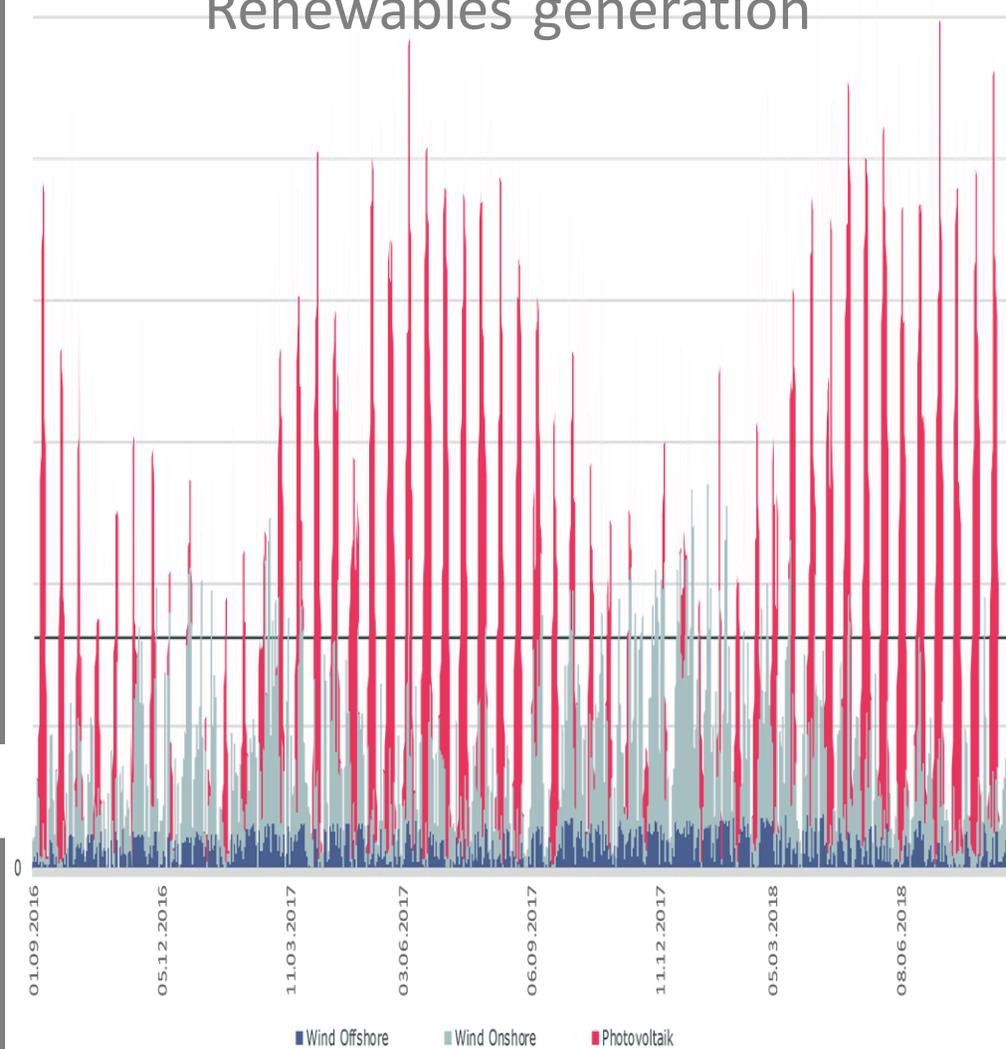
# SECTOR COUPLING AT SOURCE

## Reduce tariffs

- ↓ Network investment
- ↓ Balancing power
- ↓ Network charges
- ↓ Connection cost
  
- ↑ Connections per network capacity

**ELECTRICITY  
SECTOR**

## Renewables generation



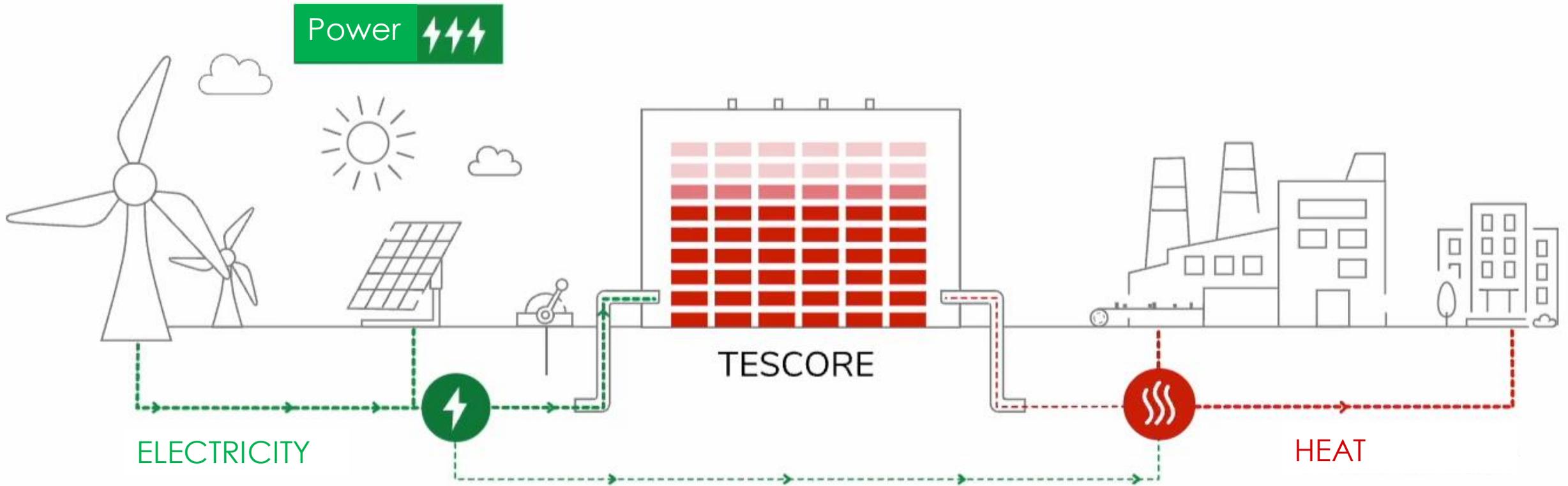
## Replace gas - NOW



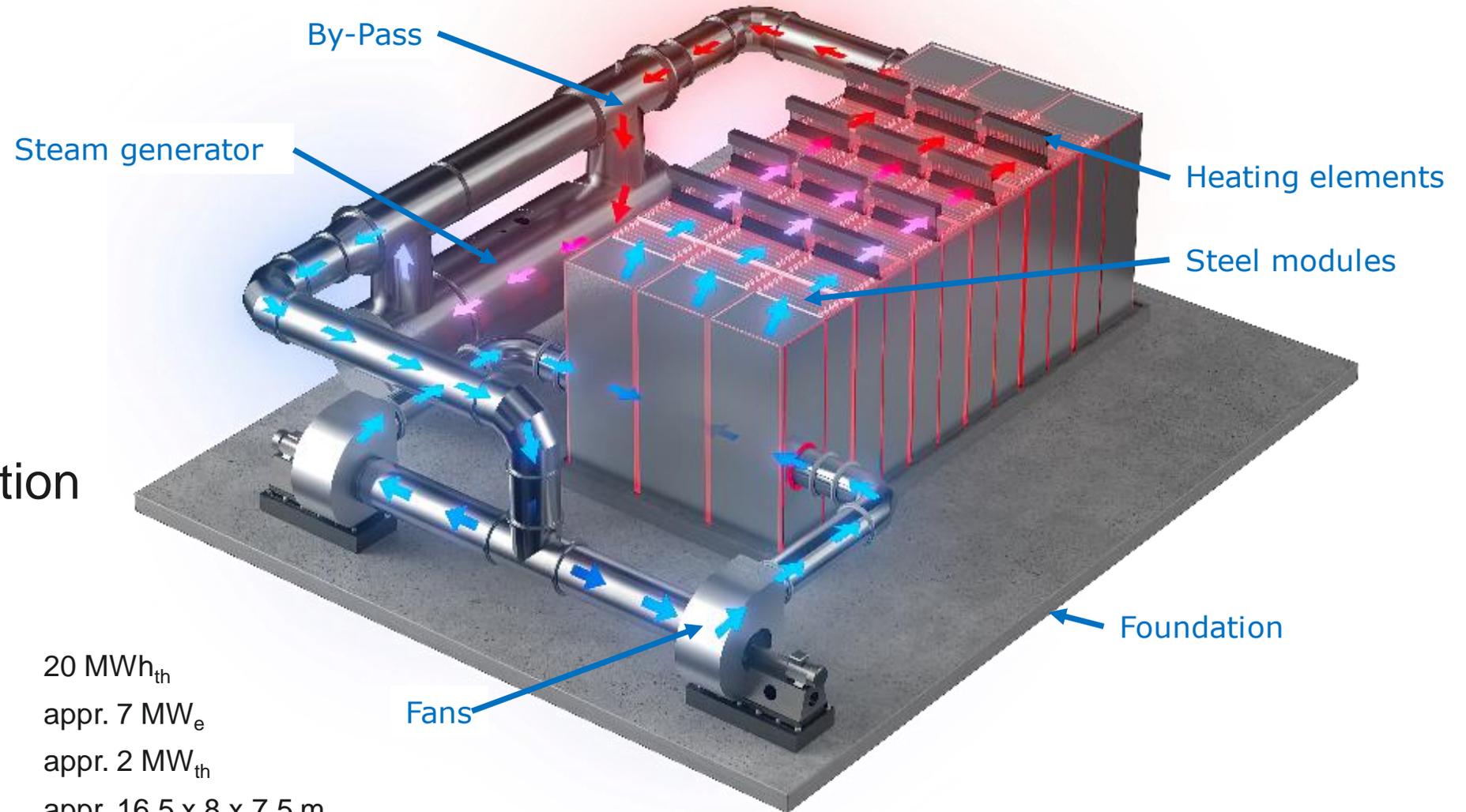
**HEAT  
SECTOR**

- CO<sub>2</sub>-free process heat
- At attractive tariffs
- On demand

# THE CLOSEST LINK BETWEEN RENEWABLES AND PROCESS HEAT



# WORKING PRINCIPLE AND MAJOR COMPONENTS



## Example specification

Capacity	20 MWh <sub>th</sub>
Max charging power	appr. 7 MW <sub>e</sub>
Max discharging power	appr. 2 MW <sub>th</sub>
Size (core only)	appr. 16.5 x 8 x 7.5 m
Weight	appr. 600 t

See Youtube video at  
<https://lumenion.com/technologie/>

# GREENING DISTILLERIES COMPETITION



- **Feasibility study at Highland Park Distillery funded through BEIS Greening Distilleries Competition**
- **Turn otherwise curtailed wind energy (27 GWh p.a.) into CO<sub>2</sub>-free steam (Replace diesel)**

# DE-CARBONISE & FLEX FOSSIL FUELED POWER PLANT

Paralleling of existing CHP-plant and  
LUMENION heat store

- Increase efficiency through peak shaving
- Fuel flexibility
- Bi-directional balancing services
- Transitioning

# KEY FEATURES



- ✓ >85% round trip energy efficiency
- ✓ Temperature range up to 400°C
- ✓ Rapid charging switch on and off times
- ✓ Purely resistive load
- ✓ Simultaneous charging and discharging
- ✓ Industry standard components and service
- ✓ Available NOW – Gas replacement
- ✓ No hazardous materials
- ✓ Superior system durability unaffected by cycling
- ✓ High residual value of steel modules
- ✓ Simple operations & maintenance
- ✓ Low life cycle costs
- ✓ Local value added

# TARGET MARKETS

## INDUSTRIES

Chemical

Pharmaceutical

Refineries

Food processing

Distilleries

Breweries

Vegetable farming

Pulp & paper

Hospitals

## POWER GENERATION

### Wind and PV

- Reduce connection costs
- Avoid curtailment
- Higher infeed tariffs
- Support new installations now

### Fossil fueled power plants

- Peak shaving
- Fuel flexibility
- Two way balancing services
- „Transitioning“

### Offshore wind

- Onlanding substation

## GREEN FUELS

### Hydrogen

- Solid oxide electrolysers

### Bio fuels

### Black pellets

### Green coal

## AGGREGATORS

„Physical option“

## DISTRICT HEATING

# THANK YOU!

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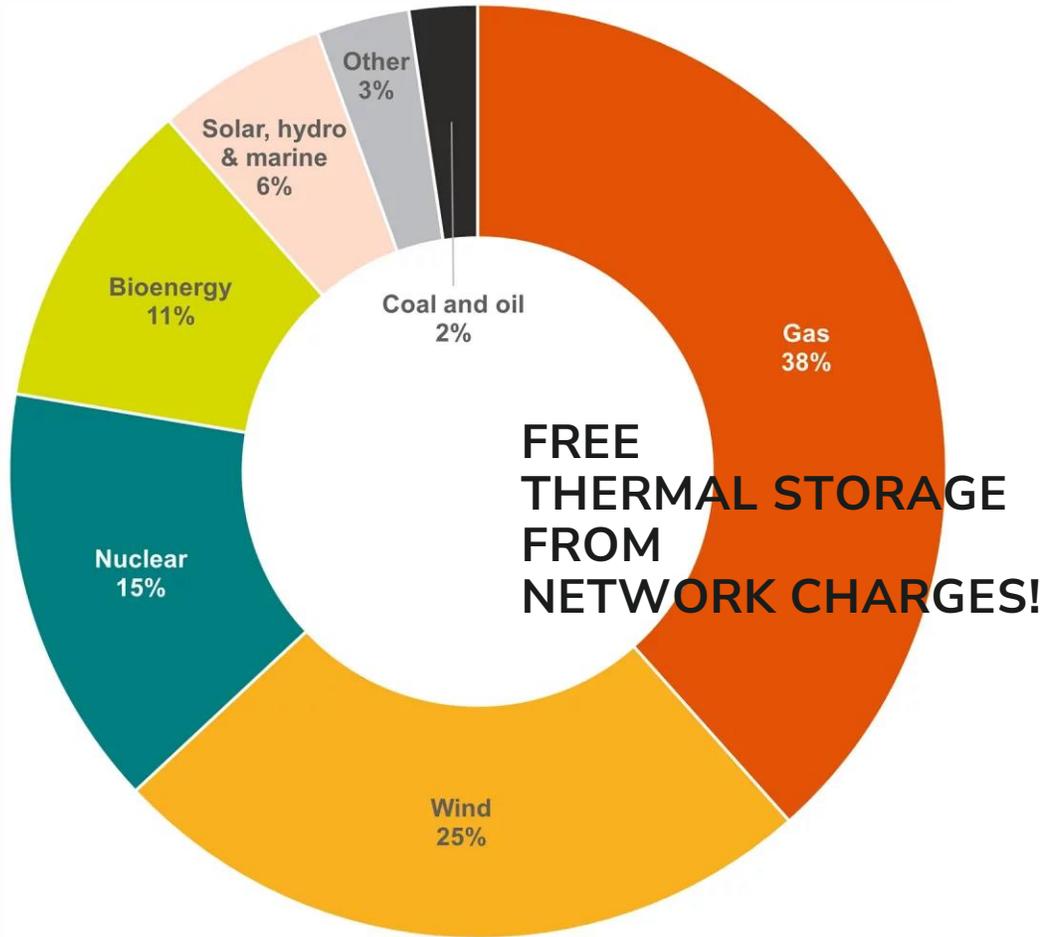
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