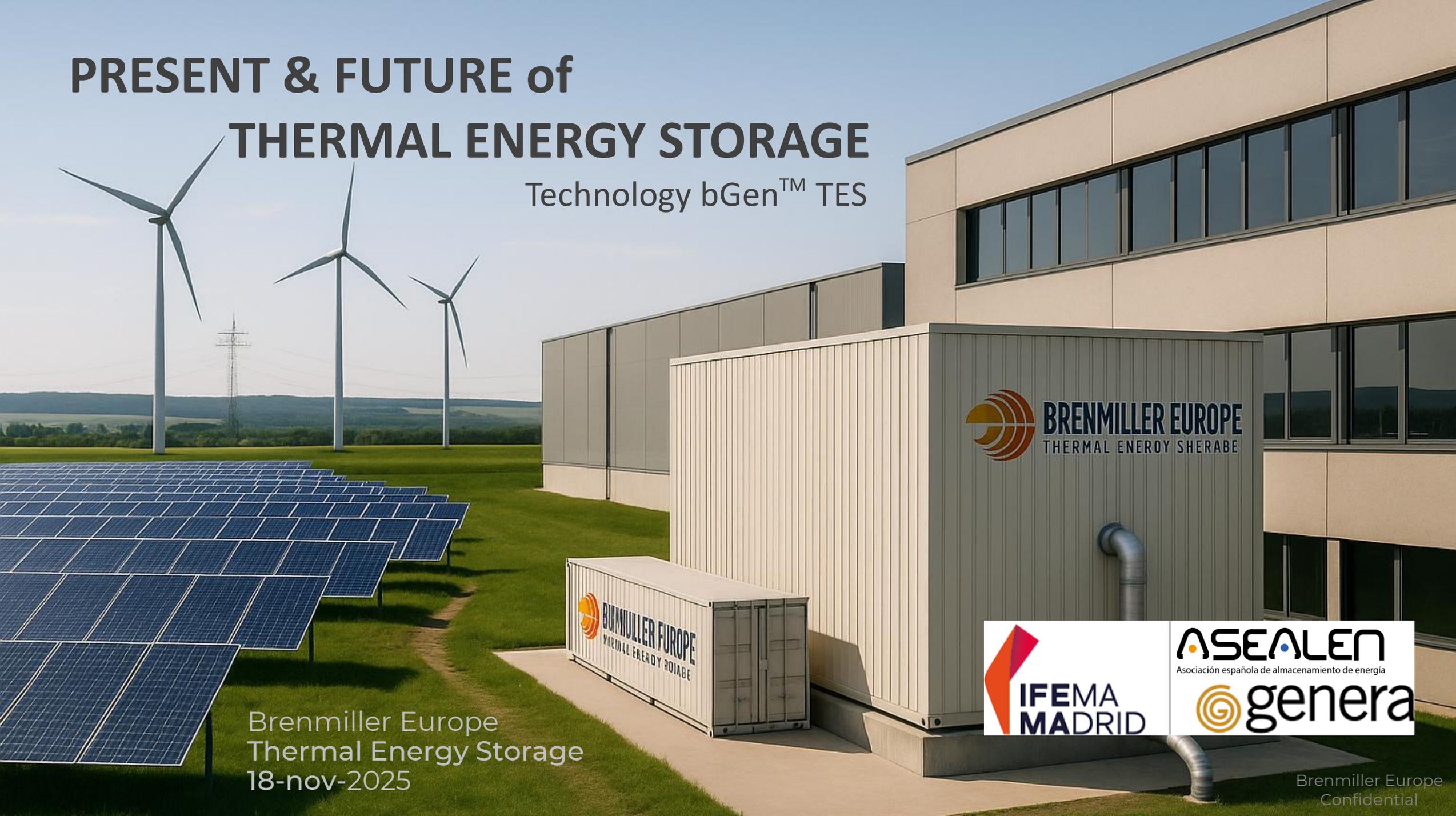


PRESENT & FUTURE of THERMAL ENERGY STORAGE

Technology bGen™ TES



Brenmiller Europe
Thermal Energy Storage
18-nov-2025



Brenmiller Europe

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Introduction



Strong partnership since about 15 years



- ✓ Established in 2009
- ✓ Renewable energy project integrator and project developer
- ✓ > 67 projects in 16 countries

www.greenenesys.com



- ✓ From 2006 to 2013: EPC and O&M of 80 PV power plants
- ✓ Today: Project Developer
- ✓ > 20 projects in 7 countries

www.viridi.de

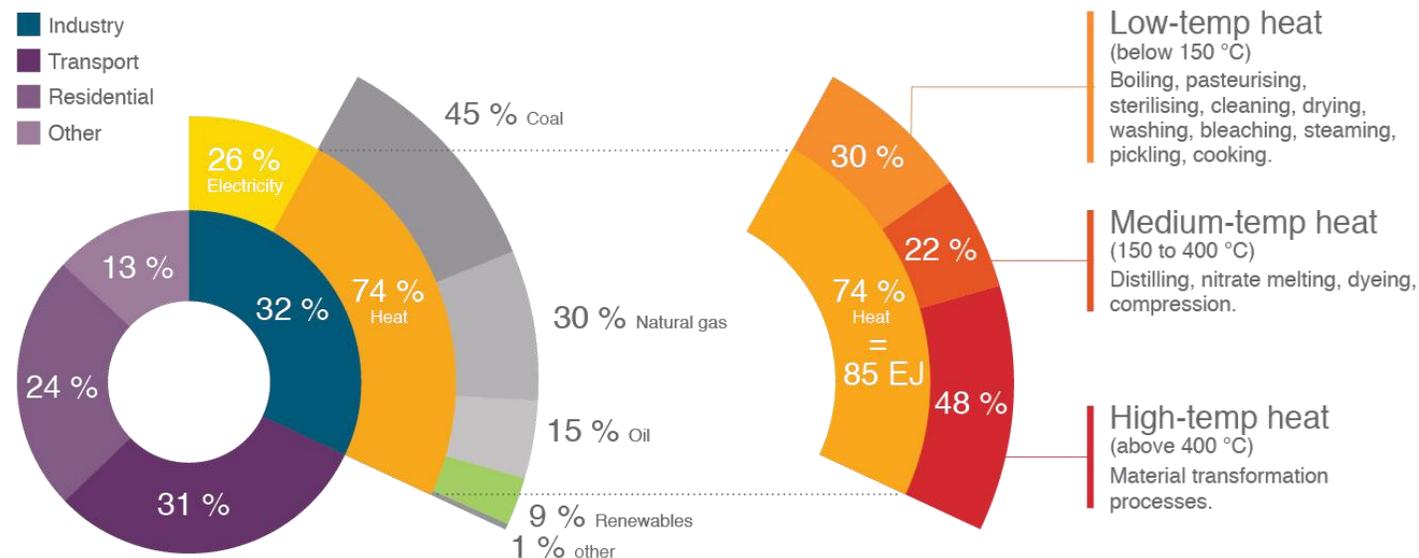


- ✓ Brenmiller Energy Ltd
- ✓ Established in 2012 [NASDAQ: BNRG]
- ✓ OEM of a Thermal Energy Storage technology (bGen™)
- ✓ 7 projects (103 MWh) in 5 countries

www.bren-energy.com

Brenmiller Europe, SL is a strategic Joint Venture between three companies - www.bren-europe.com

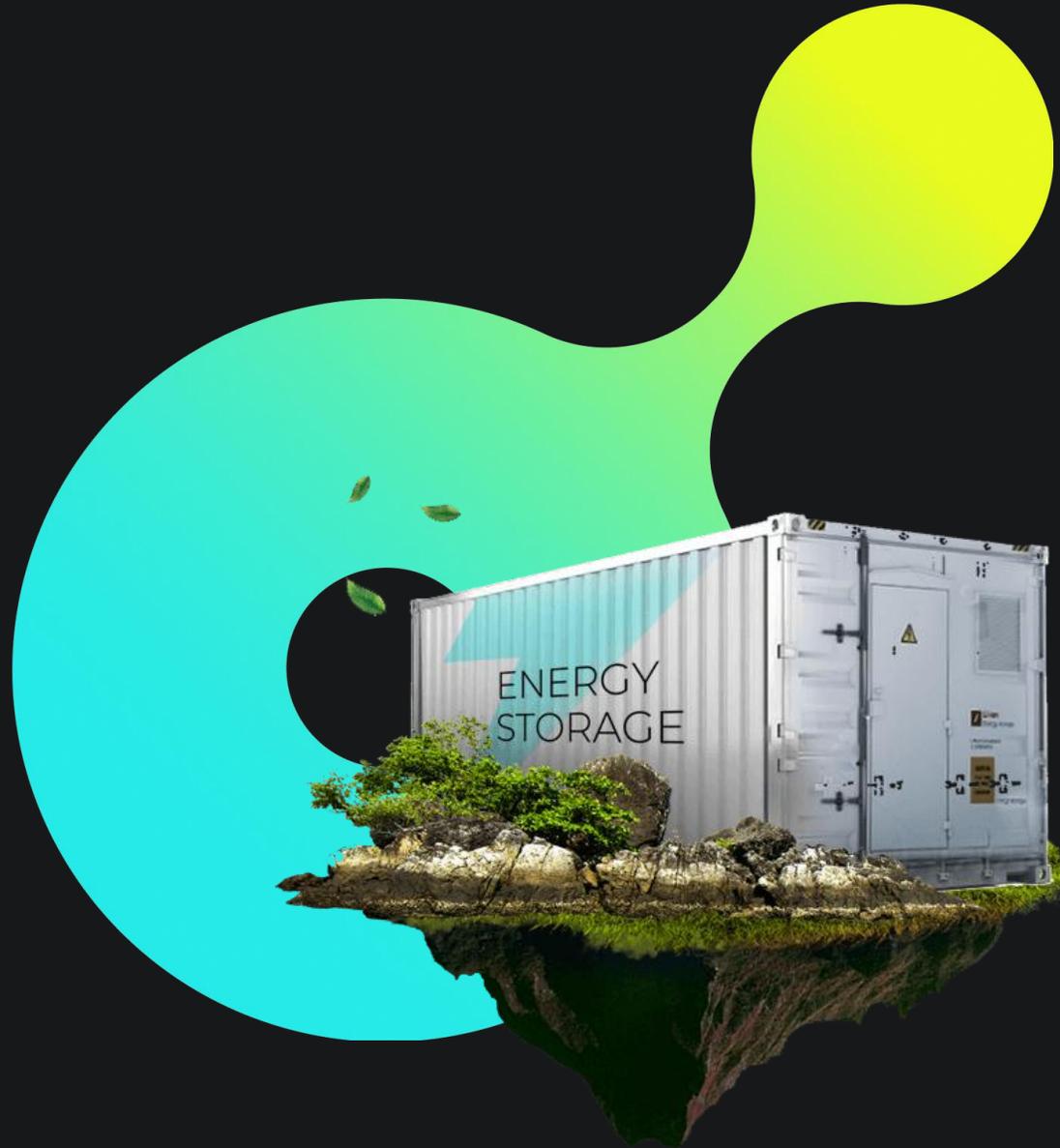
- ✓ One third of final energy consumption goes to **industry**
- ✓ **Heat** accounts for three quarter of total **industrial** energy use
- ✓ Industrial heat demand relies heavily on **fossil fuels** heat
- ✓ Half of industrial heat is at **low and medium temperature**





BRENMILLER EUROPE
THERMAL ENERGY STORAGE

bGen™ PRESENT & FUTURE



Brenmiller Europe

bGen™ – key advantages



Hybrid

Connects different Energy Sources



Modular

From Industrial to large-scale Power Plants



Lifetime

30+ Years

Flexibility
Decoupling generation from demand



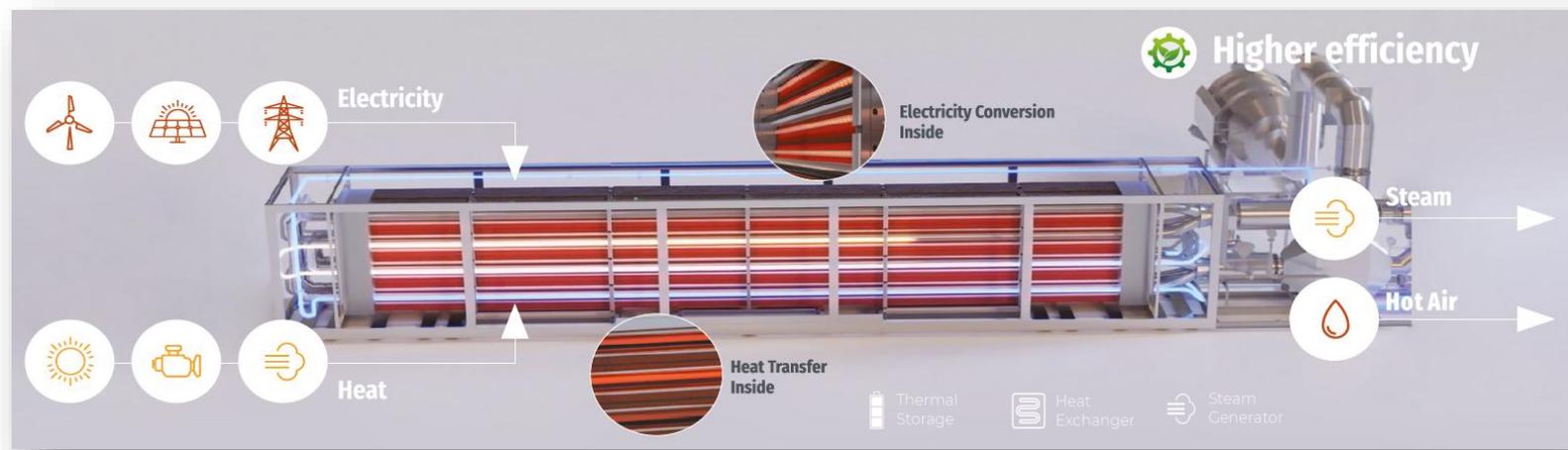
Performance

Unlimited cycles with minimal daily losses (3%)



Clean

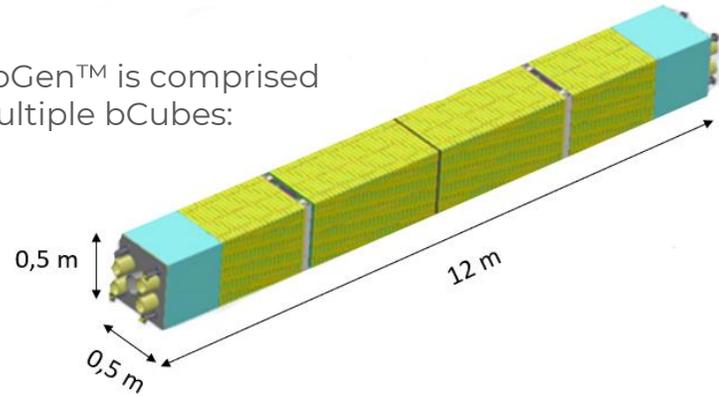
Environmentally friendly materials (crushed rocks)



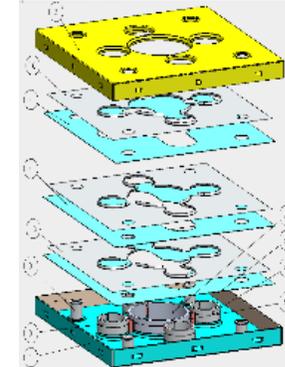
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Basic principle of the bGen™

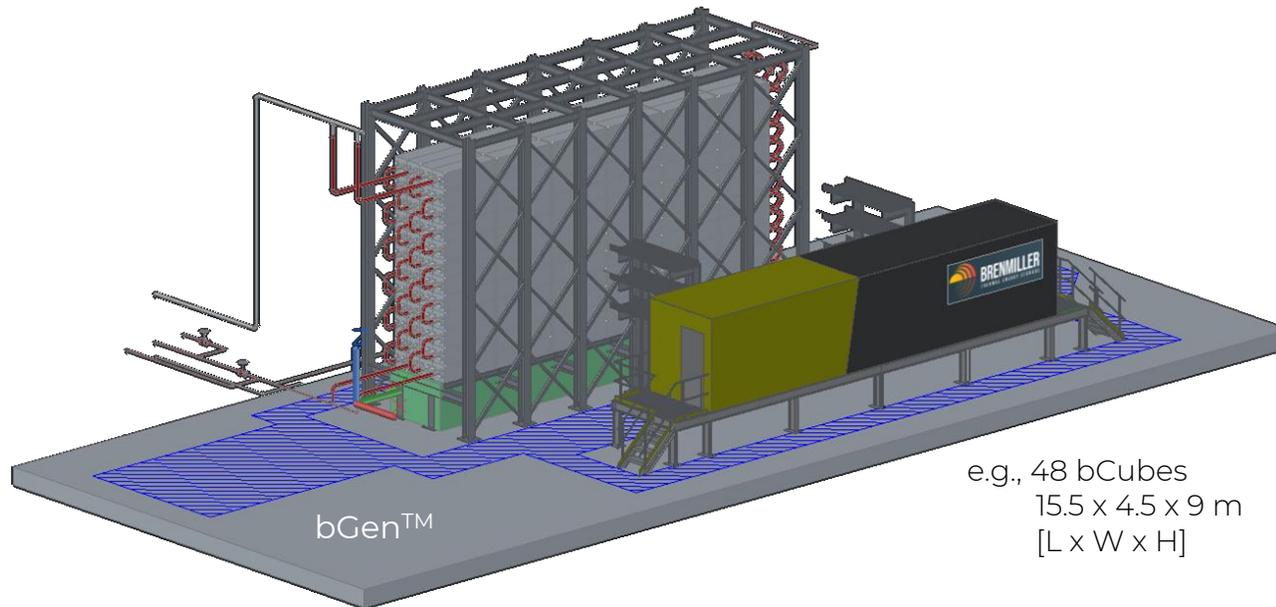
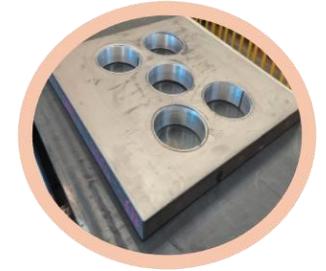
The bGen™ is comprised of multiple bCubes:



bCube

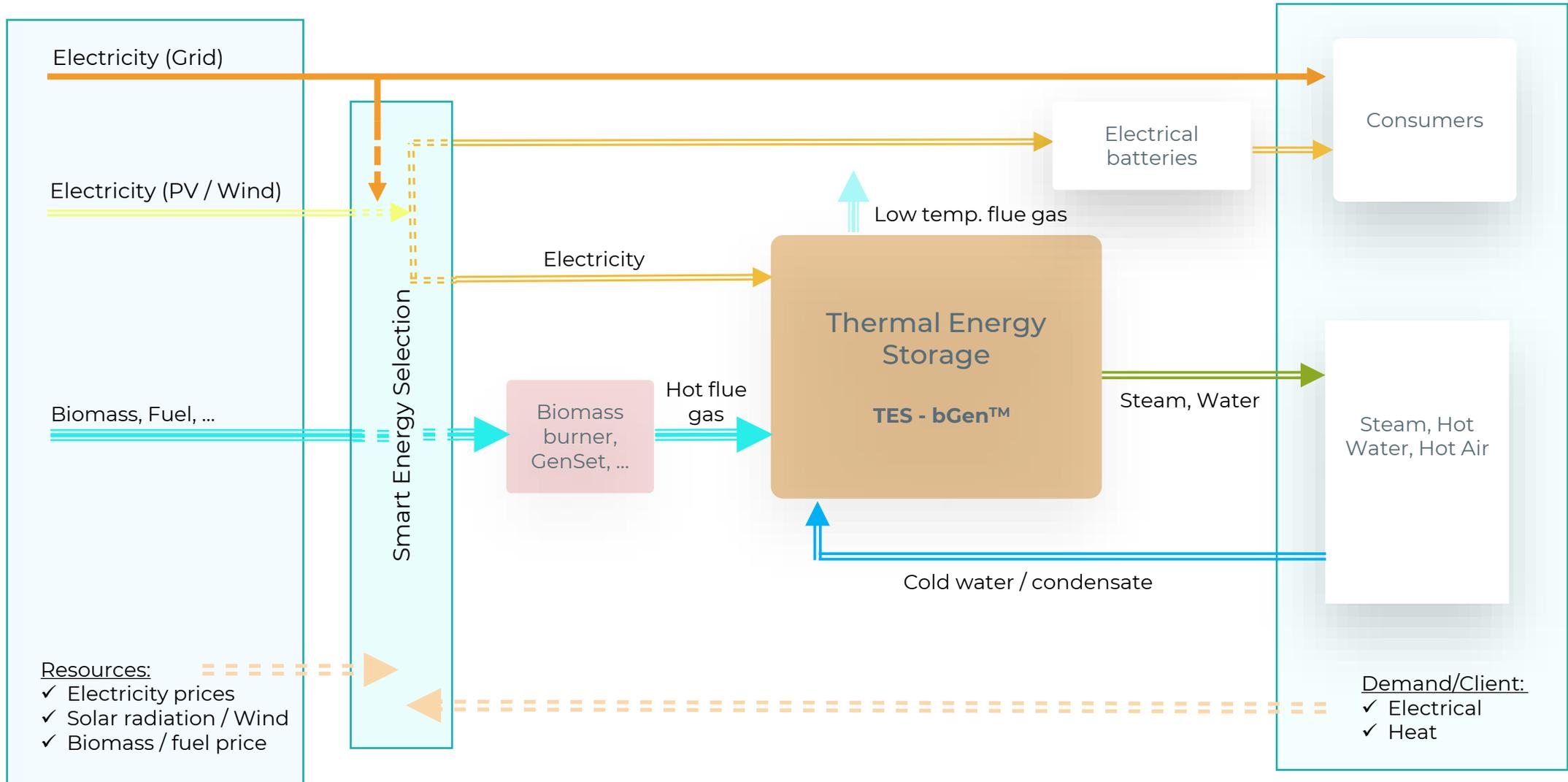


bCell



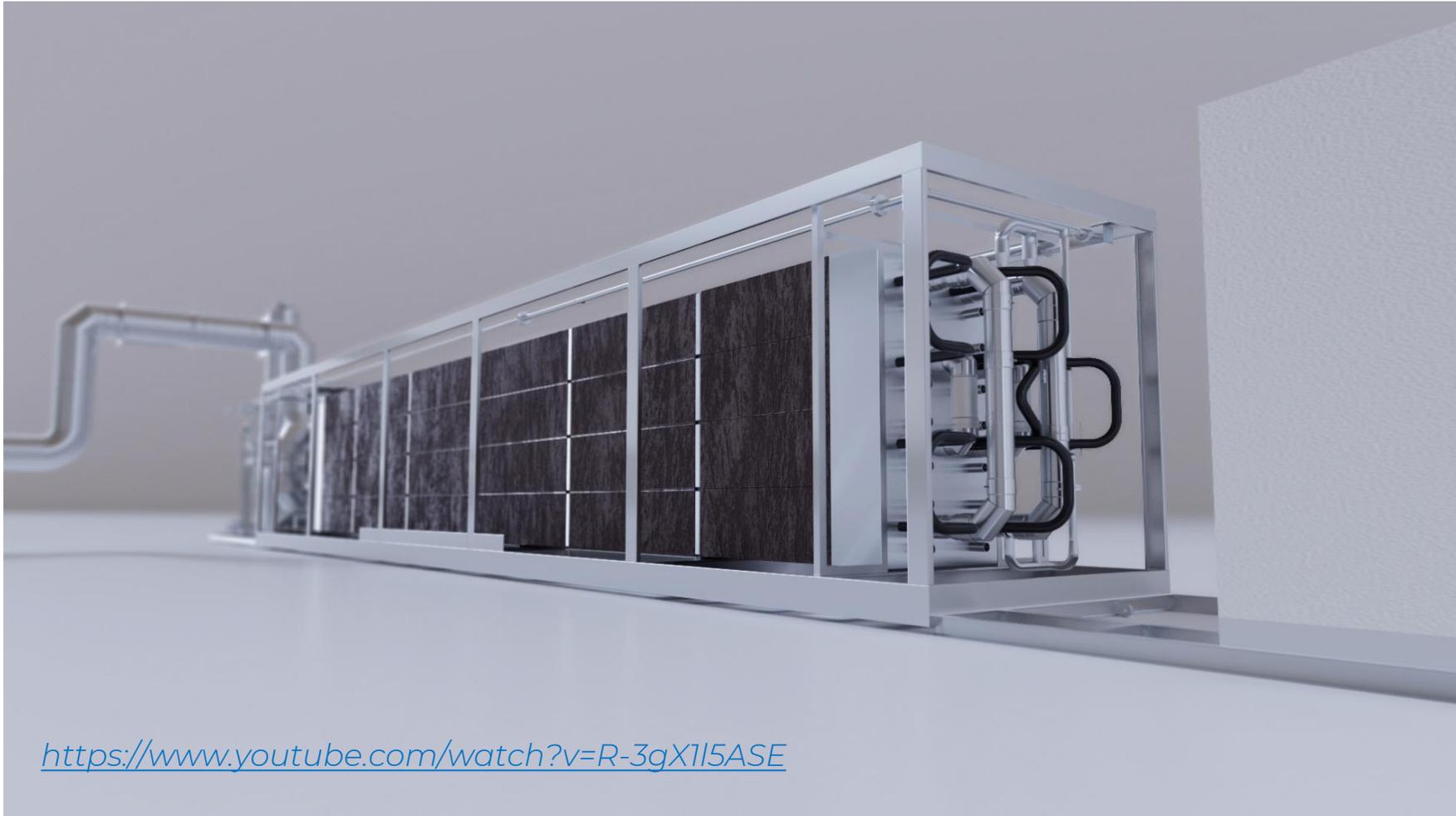
e.g., 48 bCubes
15.5 x 4.5 x 9 m
[L x W x H]





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bGen™ 3D animation (video)



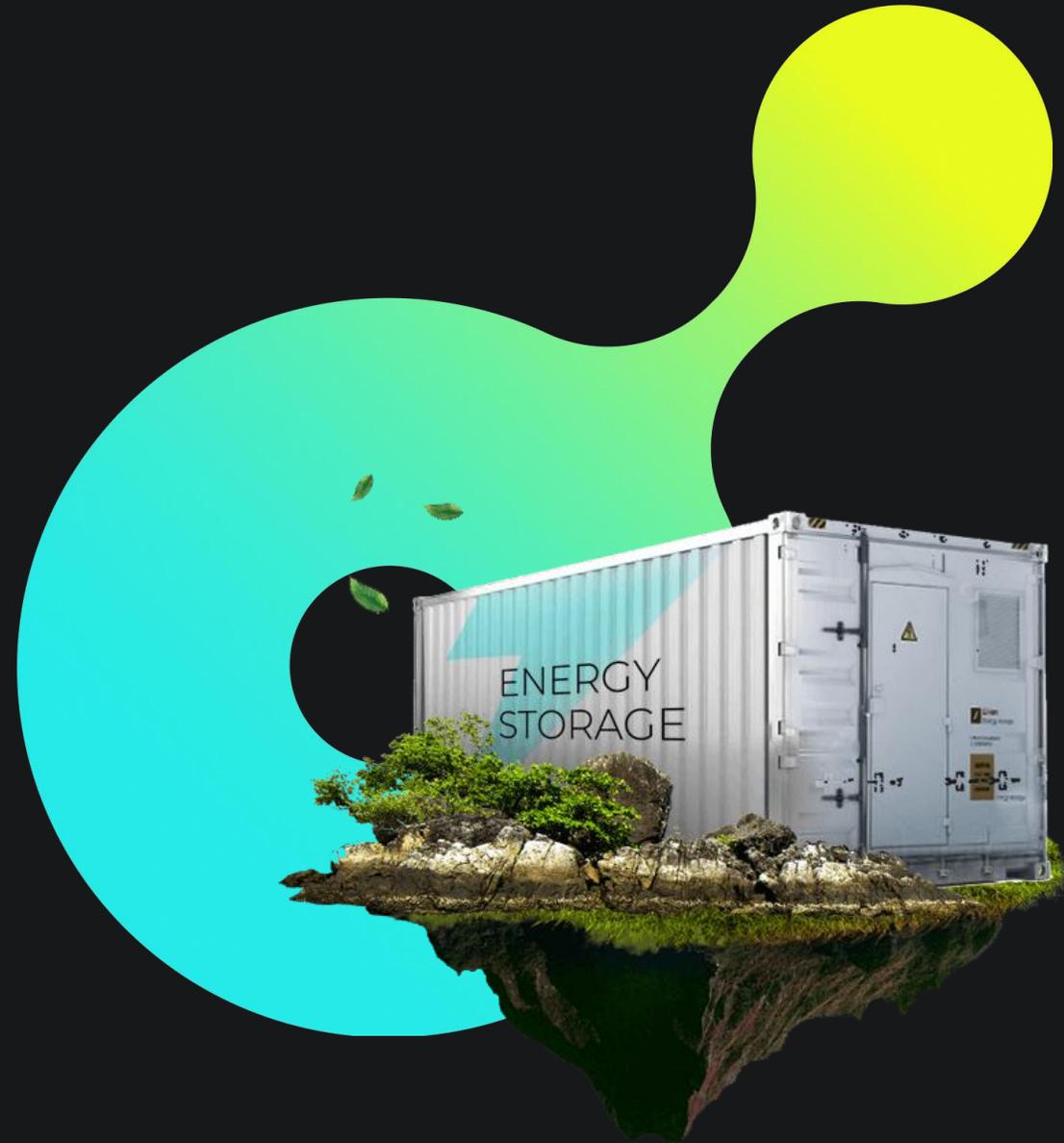
<https://www.youtube.com/watch?v=R-3gX1I5ASE>



BRENMILLER EUROPE
THERMAL ENERGY STORAGE

Power to Heat

Electrification / Grid services



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Power to Heat – Heat Electrification



Charging

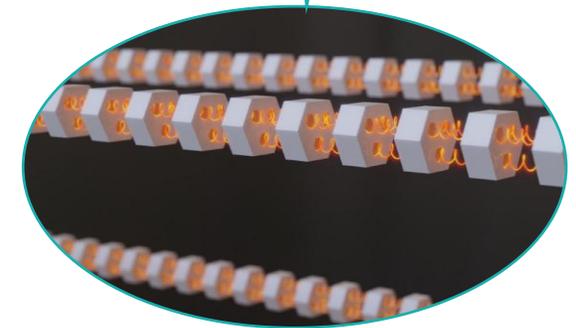
- Charging with Electricity from different sources:
 - PV or Wind
 - Grid (offpeak prices / PPA TES, ...)
- Thermal storage temperature: 700 °C

Discharging

- Steam discharging: up to 500 °C and 100 bar

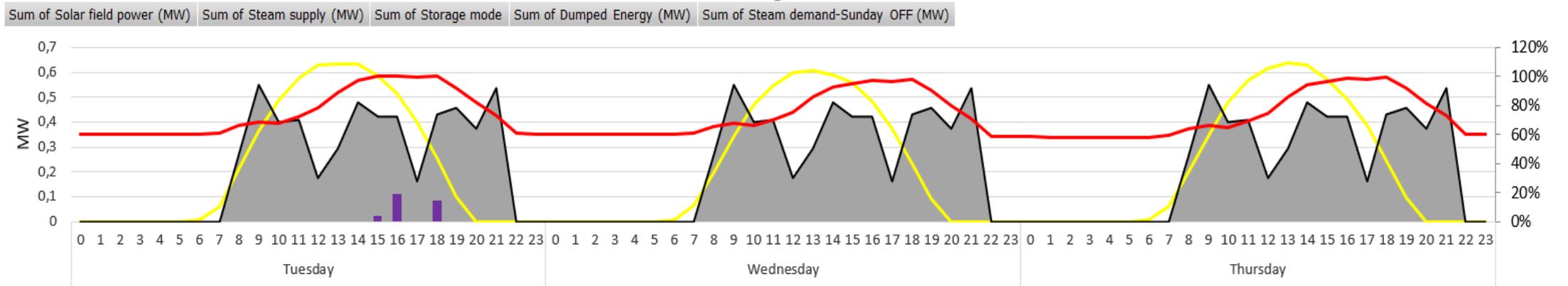


Charging the bGen with electrical heaters

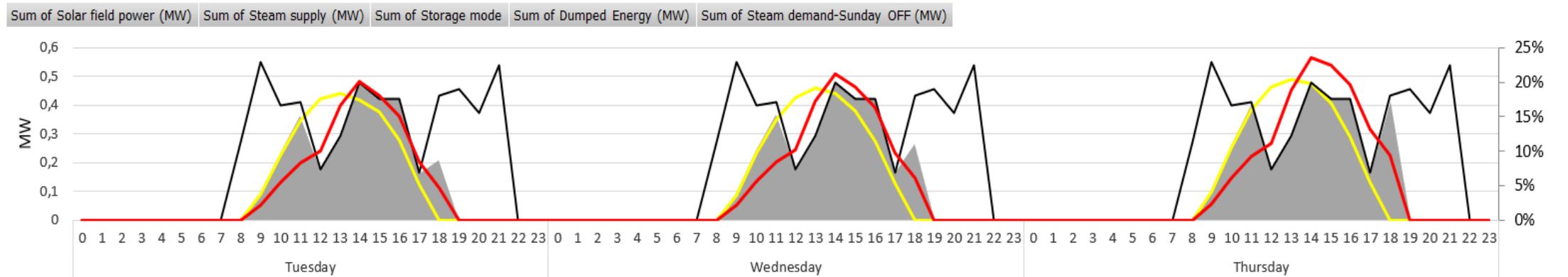


Sum of Steam supply (MW)
 Sum of Dumped Energy (MW)
 Sum of Solar field power (MW)
 Sum of Steam demand-Sunday OFF (MW)
 Sum of Storage mode

SUMMER



WINTER



Key principles

TES Charging

- First priority - Negative aFRR balancing energy *
- Second priority - PPA TES profile
- Third priority - Grid off peak price

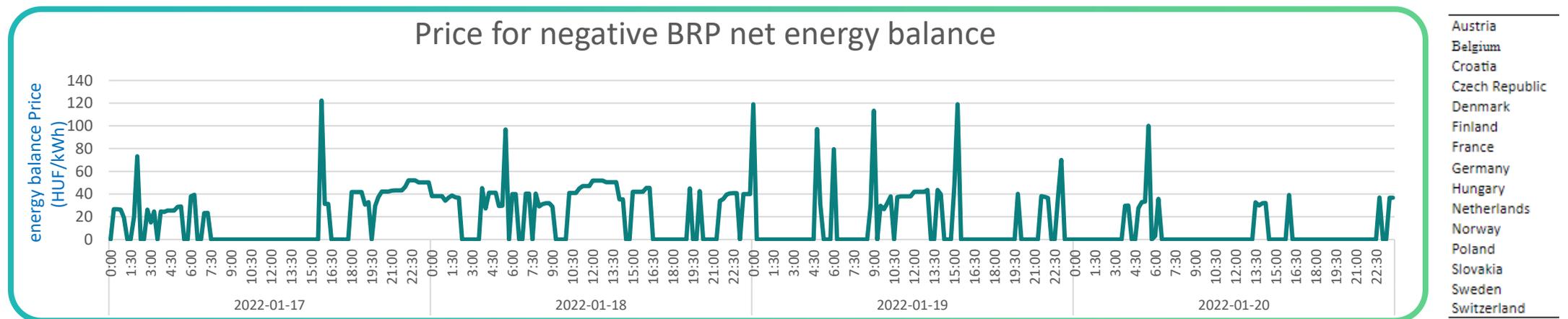
TES Discharging

- Option a - Process steam for industry
- Option b - District Heating / Grid services

Revenues

- Balancing capacity payments *
- Negative aFRR/FCR balancing energy *
- Sale of steam / hot water (NG + Emissions Saving)

[*] Hungary, Germany, Belgium,... (not in Spain, yet)

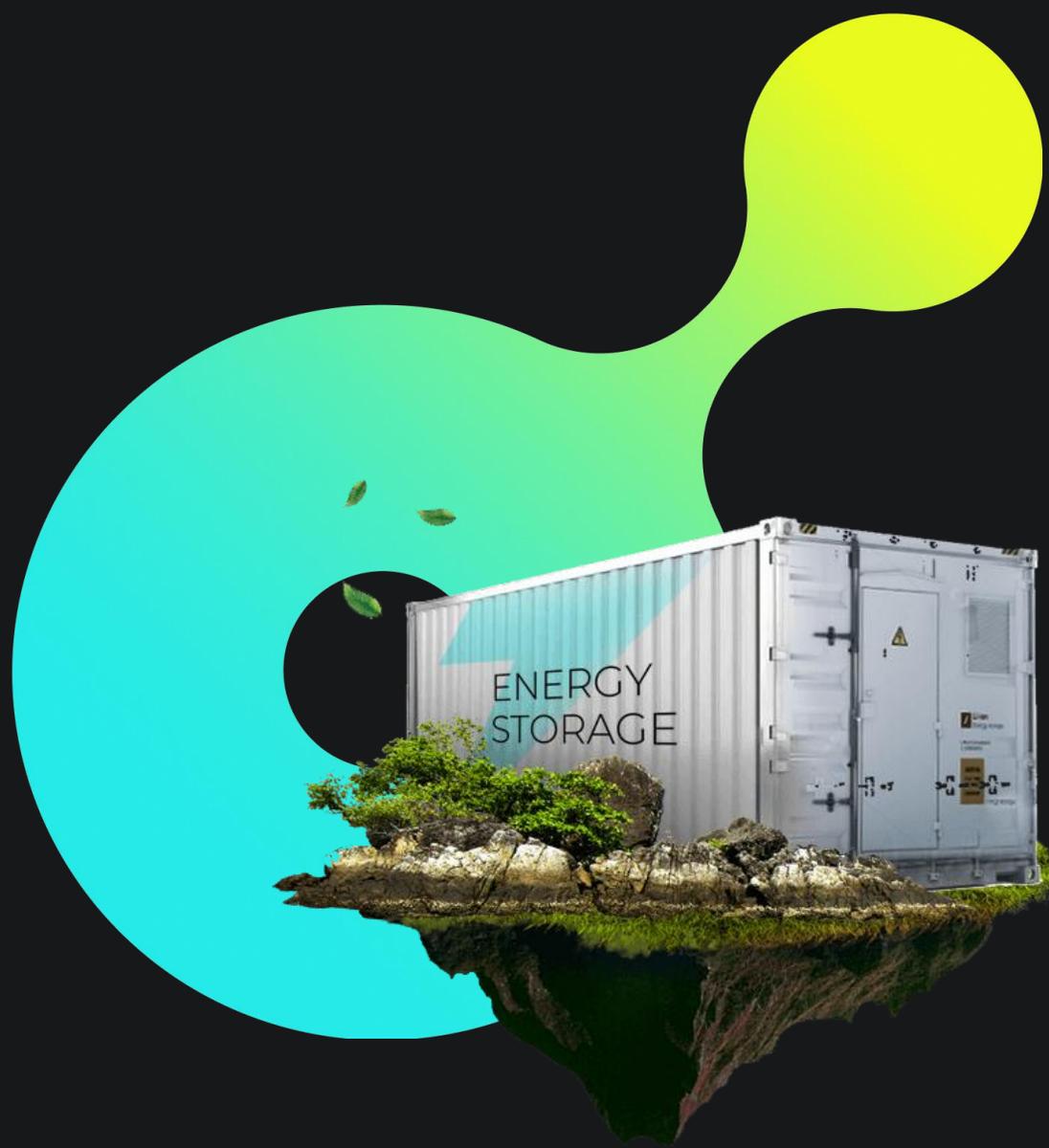




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THERMAL ENERGY STORAGE

Reference projects

QOD 2023



PROJECT	SIZE	APPLICATION	CHARGE	DISCHARGE	STATUS	COD
<u>Fortlev</u>	2 x 2 MWh	Heat to Heat	Biomass	Hot Air	Operation	2021
<u>NYPA</u>	1 MWh	Heat to Heat	Flue Gases	Hot Water	Operation	2023
		Power to Heat	Electricity			
<u>ENEL</u>	24 MWh	Heat to Power	Steam	Steam	Delivered	2025
<u>Tempo Beverage</u>	32 MWh	Power to Heat	Electricity	Steam	Construction	Dec-2025
<u>Wolfson Hospital</u>	12 MWh	Power to Heat	Electricity	Steam	Construction	2026
<u>Partner in Pet Food</u>	30 MWh	Power to Heat	Electricity	Steam	Engineering	2026
<u>SolWinHy Cádiz</u>	56 MWh	Power to Heat	Electricity	Steam	Development	2028

Technology Maturity Level - BRENMILLER: TRL 9 (1-9 levels. > 60 MWh commercial plants in operation - 2025)



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Heat to Heat – From Biomass

OPERATION



FORTLEV – 4 MWh TES

- ✓ TES charged from biomass combustion (wood chips)
- ✓ Delivers hot air at 350 °C on demand
- ✓ 2 x 2 MWh TES
- ✓ Thermal power: 300 kW
- ✓ 60% fuel savings, 100% emission reduction
- ✓ Payback: 4 years
- ✓ COD 2021





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Heat/Power to Heat – From Gas Turbine

OPERATION



NYPA - 1 MWh TES

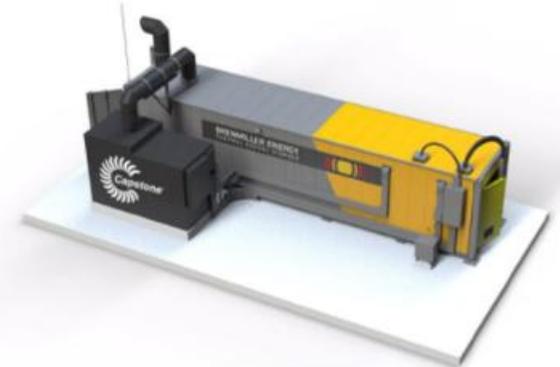
- ✓ Hybrid charging: electricity & flue gases from a gas turbine (GT 200 kW)
- ✓ Delivers hot water on demand
- ✓ 25% fuel savings and emissions reduction
- ✓ COD 2023



Capstone Turbine partners with NYPA and Brenmiller Energy in storage project

Bioenergy International | Heat & Power | April 6, 2020

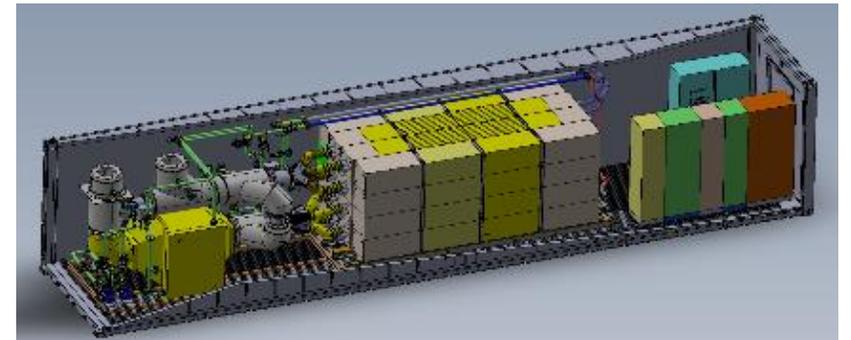
In the United States (US), Capstone Turbine Corporation, a leading clean technology manufacturer of microturbine energy systems, has recently announced that it has partnered with the New York Power Authority (NYPA) and Brenmiller Energy on a thermal energy storage project for Purchase College, State University of New York (SUNY).



Capstone Turbine has partnered with the New York Power Authority (NYPA) and Brenmiller Energy on a groundbreaking thermal energy storage project for State University of New York (SUNY) Purchase College (Image courtesy Capstone Turbine).



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Heat to Heat – Combined Cycle Gas Turbine

DELIVERED



ENEL (Italy) - 24 MWh TES

- ✓ Energy shifting
 - ✓ Charged with excess steam at hours with low electricity prices
 - ✓ Delivers steam at hours with high electricity prices

- ✓ Increasing maximum load and reducing minimum load
- ✓ Optimizing revenue streams & ancillary services
- ✓ Reducing ramp-up time

✓ Charging Steam: 9 427 kg/h, 550 °C → 295 °C, 80 bar

✓ Discharging Steam: 6 600 kg/h, 150 °C → 360 °C, 30 bar

✓ COD 2025







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Power to Heat – Industry decarbonization

CONSTRUCTION



Tempo Beverage (Israel) - 32 MWh TES

- ✓ Tempo Beverage Company, Netanya (owned by **Heineken**)
- ✓ TES will supply base load and peaks process steam
- ✓ Charged with 5.6 MWe from the grid (off-peak prices) and PV sources
- ✓ Discharge max steam flow of 14 tn/h at 7 bara and 168 °C
- ✓ Dimensions (L x W x H): 15 x 5 x 6 meters
- ✓ TES will replace 85 % of current fossil fuel burning
- ✓ Eliminate 6,200 tn CO₂eq emissions annually
- ✓ Implementation of Energy Service Company (ESCO) model
- ✓ Expected cost savings of \$7.5 million for Tempo over the span of 15 years (HaaS agreement)
- ✓ COD - Dec 2025





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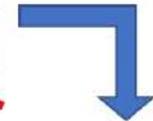
Power to Heat – Real Estates decarbonization

CONSTRUCTION



Wolfson Hospital, Holon (Israel) - 12 MWh TES

- ✓ TES will supply steam for the use of the hospital
- ✓ TES charged with electricity from the grid (off-peak prices)
- ✓ TES expected to eliminate 95 % of local GHG in the city center
- ✓ Existing boiler will be downsized to use for back-up purposes only
- ✓ Integration with existing steam distribution infrastructure
- ✓ 20-40% reduction in the price for each ton of steam produced
- ✓ System implemented under Energy Service Company (ESCO) model
- 7-year Heat as a Service agreement (HaaS)
- ✓ COD - 2026



\$6.5m
Customer's
energy savings

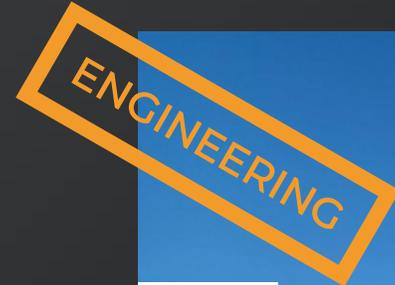
3.9 MT
Annual abatement





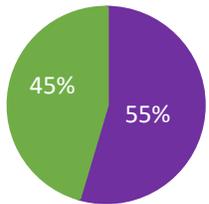
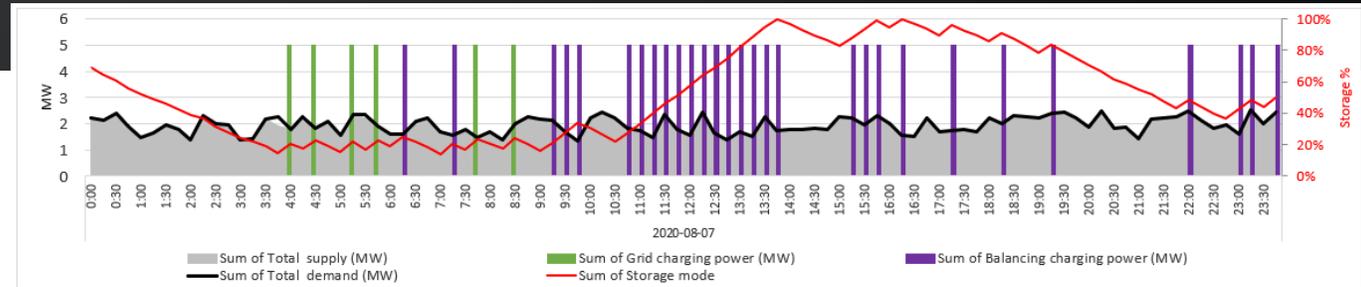
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Power to Heat – Industry decarbonization (Grid Services)



PPF, Dombovar (Hungary) - 30 MWh TES

- ✓ Partner in Pet Food (PPF)
- ✓ TES charged with negative aFRR/FCR balancing energy + PV * and grid off-peak prices
- ✓ 12-year Heat as a Service agreement (HaaS)
- ✓ Charge: 3 MWe from the grid
- ✓ Discharge: max steam flow 1 tn/h at 10 bara - 180 °C

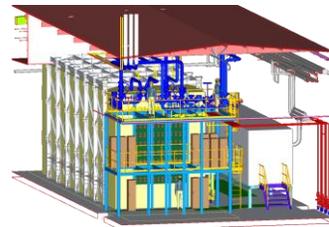


Energy Sources (MWh)

- Balancing
- Grid off peak

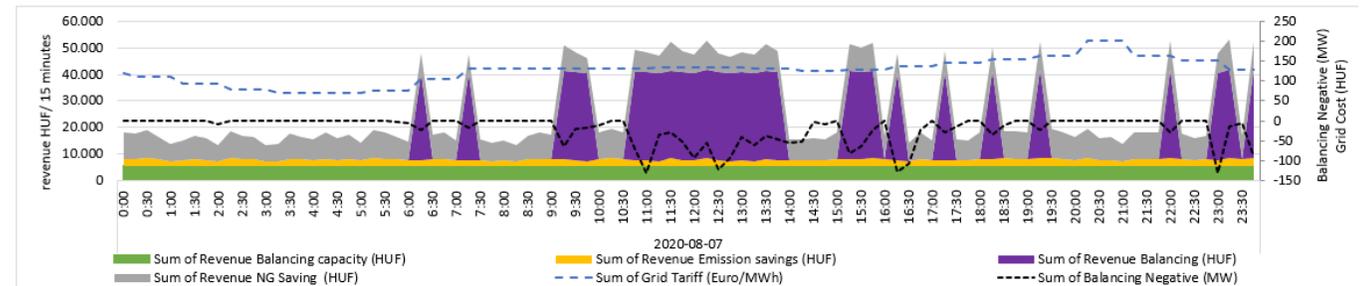
€ 1.9m Customer's energy savings

1.4 MT Annual abatement



Revenue Breakdown

- Balance capacity payments
- Revenue Balancing services
- Saving on natural gas
- Saving on Emissions





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Power to Heat – Green Hydrogen / e-Methanol Plant

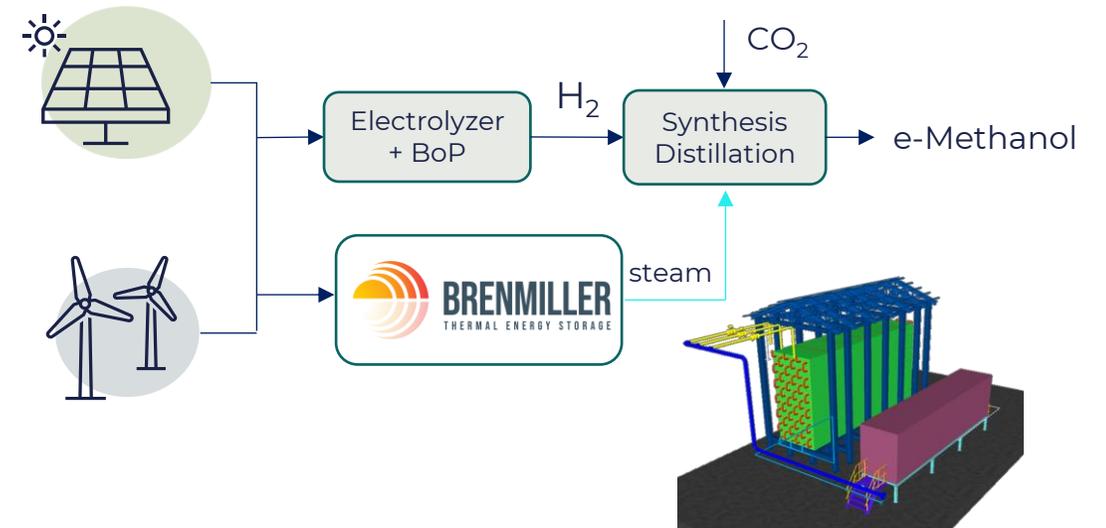
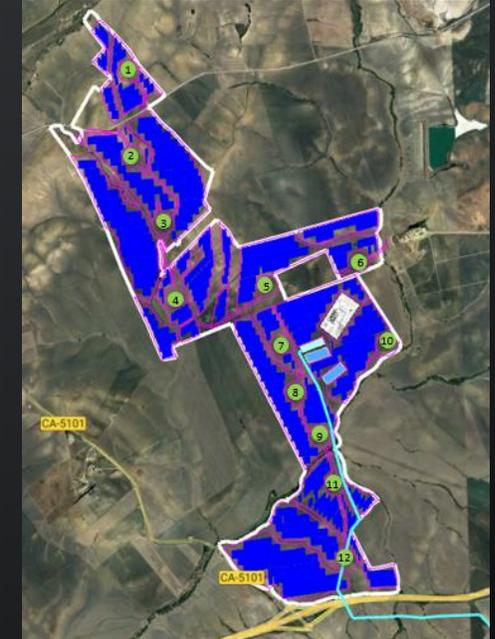


SolWinHy Cádiz (Spain) - 56 MWh TES

- ✓ Green hydrogen and e-methanol plant - COD in 2028
- ✓ Process plant disconnected from the grid
- ✓ TES will supply steam required for methanol distillation
- ✓ Possible to charge the TES with excess energy (daytime) and discharge steam 24/7 at partial loads
- ✓ Charge: 9.6 MWe from the PV+Wind excess energy
- ✓ Discharge: max steam flow 10 ton/h at 7 bara and 175 °C
- ✓ Dimensions (L x W x H): 15 x 6 x 8 meters



DEVELOPMENT



IF25 – EU Heat Auction

- ❑ Budget: 1000 M€ in 3 baskets:
 - > 400 °C / > 3 MW_{th} → 500 M€
 - < 400 °C / > 5 MW_{th} → 350 M€
 - < 400 °C / > 3 & < 5 MW_{th} → 150 M€
- ❑ Support Mechanism: Fixed premium subsidy in €/ton CO₂ abated
- ❑ Duration: 5 years of semi-annual payments, proportional to verified CO₂ reductions
- ❑ Eligibility: Industrial heat (TES) > 100°C, > 3 MW_{th}
- ❑ Launch: December 3rd, 2025 (TBC)



PERTE II Decarbonization - Spain

- ❑ Grant: About CAPEX
- ❑ Launch: Q4 2025 / Q1 2026 (TBC)
- ❑ Scope: TES, TES + PV

CAEs (Energy Saving Certificates) - Spain

- ❑ Increased energy efficiency of the facility
- ❑ Available for change from Low-efficiency tech. to Brenmiller bGen TES (97%)
- ❑ 1 KWh saved = 1 CAE (≈140-160 €)

GRANTS COULD COVER UP TO 40-60% OF CAPEX OR 10-20€/MW OF OPEX

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Thank you



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