



ELECTRIFICATION AND INDUSTRIAL COMPETITIVENESS: CAN AUSTRIAN INDUSTRY COMPETE

Montel Energy Day Austria – Lukas Pataky – 10th Sep 2026

? Under which circumstances can electrification lead to competitiveness and where is Austria in European scale ?

AGENDA

Why am I talking - who is Wienerberger

› ELECTRIFICATION REASONS AND COSTS

› WIENERBERGER USE CASE

› POWER MARKET COMPETITIVENESS

› FINDINGS

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› WHO IS WIENERBERGER AND WHY I TALK



THE WIENERBERGER ENERGY TEAM SET UP

Group CFO

Director of Procurement
Richard Harradine

Group Head of Procurement – Energy
– Lukas Pataky

Commodity
Manager Energy –
Katri Evdokimova

Commodity
Manager
Cleantech – Peter
Petrás

Energy Analyst -
Anna Kiszely



Team Mission

To leverage market expertise and innovative procurement strategies to secure resilient and sustainable energy supply at optimal value.



A global leader in Building & Infrastructure solutions

Roof, Wall & Façade and Pipes

- › World's biggest brick manufacturer
- › Market leader in Roof tiles in Europe
- › Leading Pipe systems provider



~8 TWh
Gas consumption



~4.5 bn €
2025 Revenues



>20,000
employees



>200
production
sites



~30
Countries
in Europe, India, North
America



**3 electrified
plants**

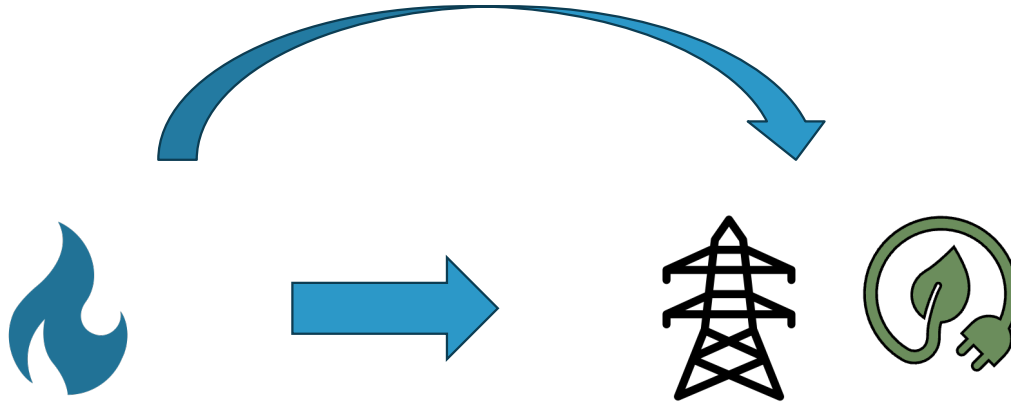


~760 mn €
Operating EBITDA

› ELECTRIFICATION – WHAT AND WHY



WHAT IS ELECTRIFICATION



Replacing heat from fossil fuels by heat generated by electricity, in best case fossil free.

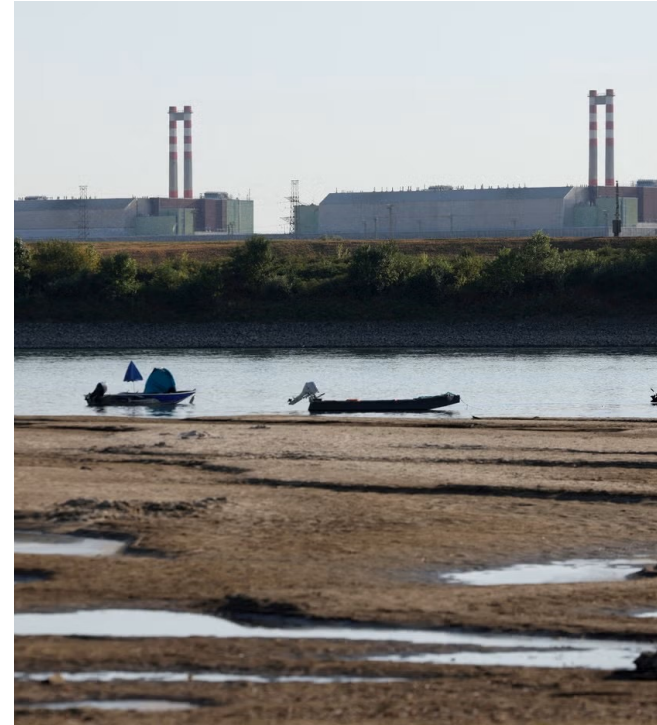
TOTAL ENERGY CONSUMPTION SEES UP TO 1200 TWH OF FOSSIL ENERGY USE

Metric	EU-27, 2024	Share
Total industrial final energy consumption	8,835 PJ ≈ 2,454 TWh	100%
Electricity	2,945 PJ ≈ 818 TWh	33.3%
Natural gas	2,817 PJ ≈ 783 TWh	31.9%
Renewables & biofuels	999 PJ ≈ 278 TWh	11.3%
Oil products	922 PJ ≈ 256 TWh	10.4%
Solid fossil fuels	484 PJ ≈ 134 TWh	5.5%
Derived heat	483 PJ ≈ 134 TWh	5.5%
Non-renewable waste	186 PJ ≈ 52 TWh	2.1%

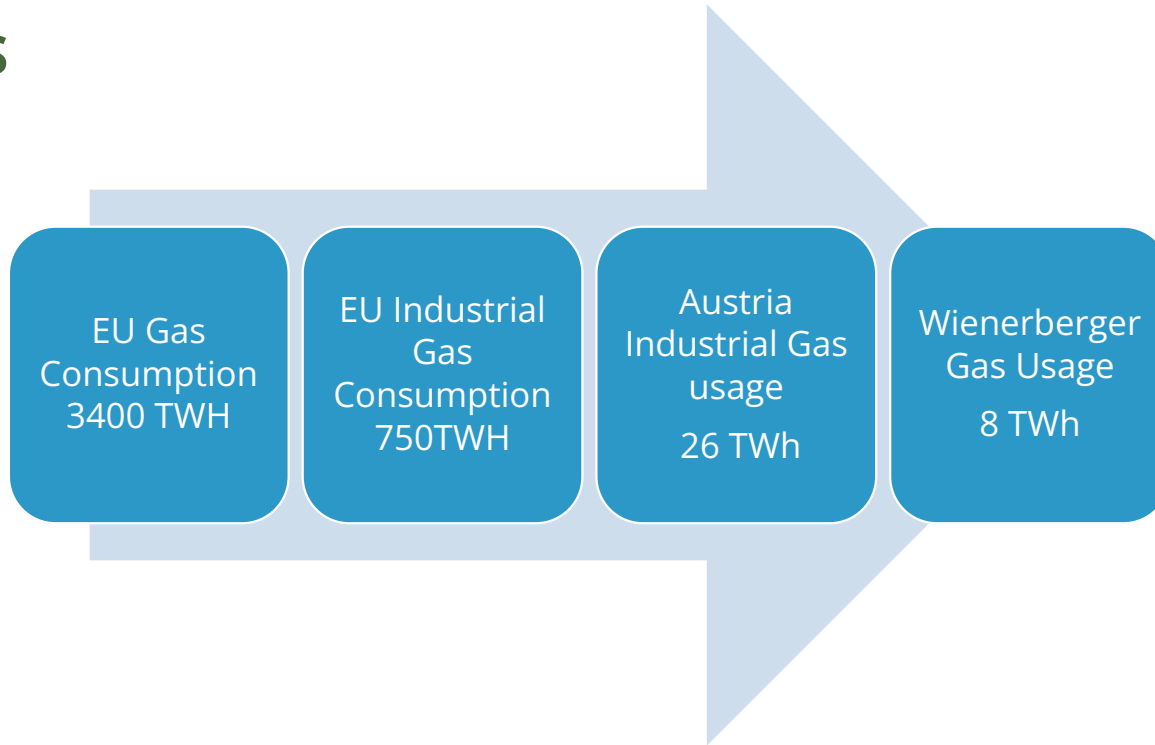
WHY ELECTRIFICATION MATTERS

- Improving Energy Security of Europe by replacing imported fossil fuels
- Improving European trade balance with rest of the world with lowering imports
- Boosting domestic technological research and development / supporting industry
- Fighting the climate change/Green deal

GETTING RID OF FOSSIL FUELS

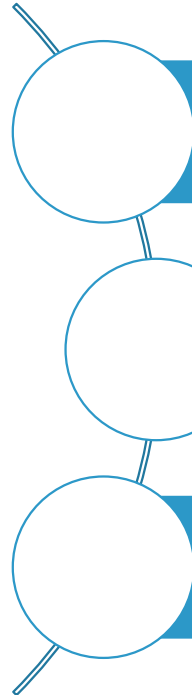


FOCUS GAS



Wienerberger has 1% share on EU industrial gas usage and respective CO2 emissions

HOW TO GET RID OF NATURAL GAS



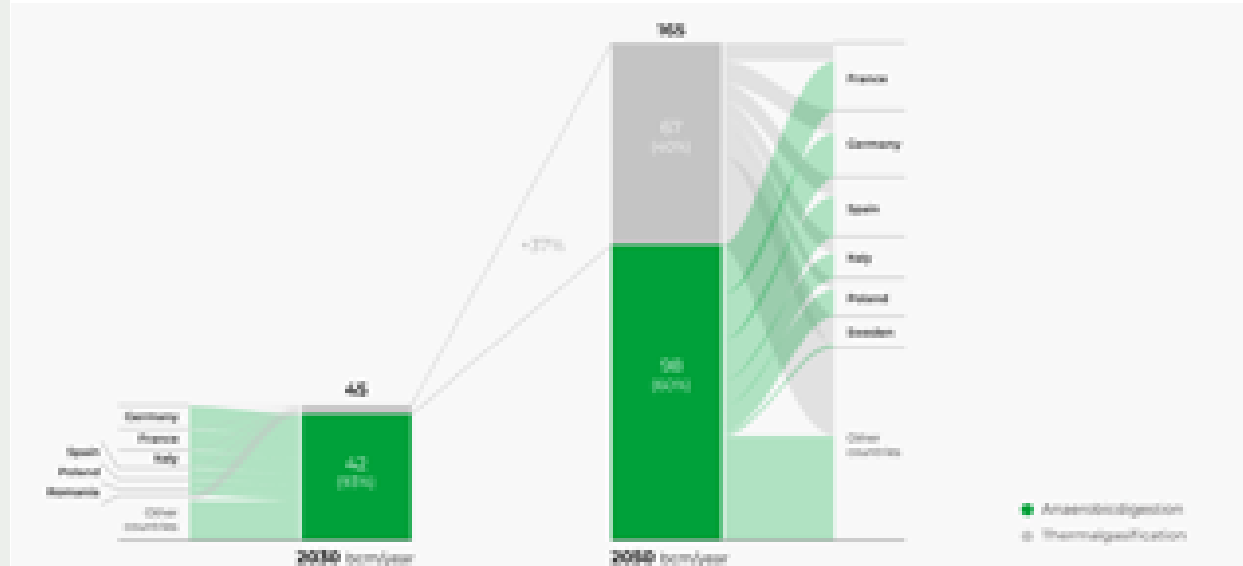
Reduce energy use and optimize

Green gas

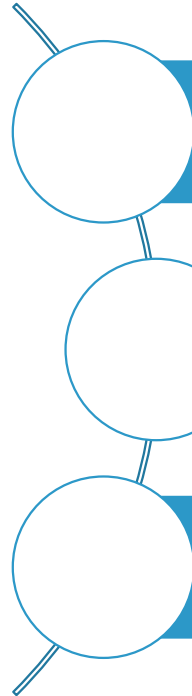
Electrify

GETTING RID OF FOSSIL FUEL - BIOMETHANE

- EU Production potential is at 165 bcm biomethane in 2050 based on EU.
- Current target fulfillment is behind, so the target fulfillment is under question
- The current EU consumption is 330 bcm, **biomethane at 165bcm would replace 50% of natural gas under current usage scenario**
- Important factor for decarbonization, supporting local farming and country side development



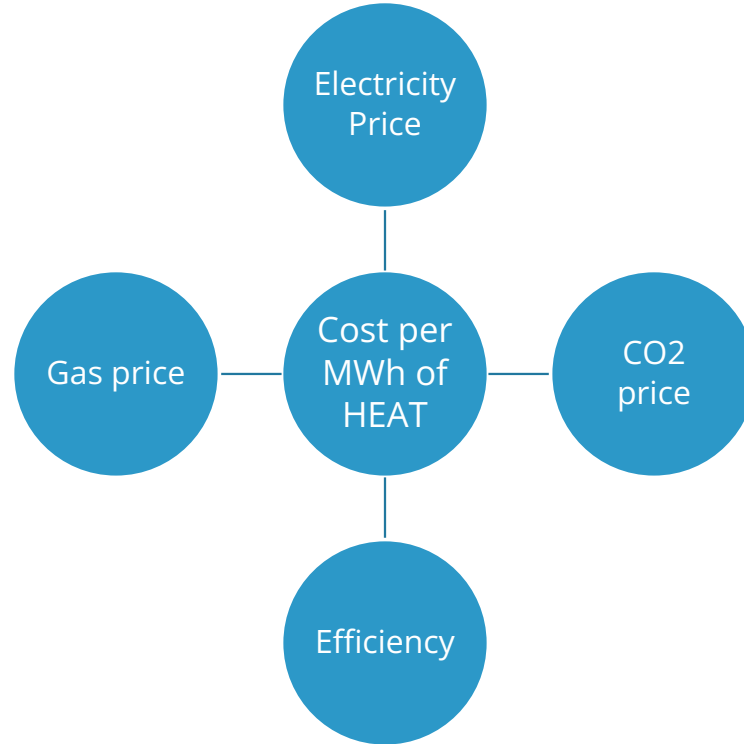
ELECTRIFICATION IS NEEDED TO GET RID OF NATURAL GAS

- 
- Reduce energy use and optimize
 - Green gas – up to 50%
 - Electrify

ELECTRIFICATION

There is no single electrification technology — the optimal solution depends primarily on process temperature, heat-transfer requirements and operating profile.

ECONOMICS OF ELECTRIFICATION



COMPARING POWER AND GAS IN EQUATION

$$C_{gas} = \frac{P_{gas}}{\eta_{gas}} + CO_2$$

$$C_{electric} = \frac{P_{power}}{\eta_{electric}}$$

Gas efficiency = 70%

Electric efficiency = 95%

Simple comparison without CO2

$$\frac{P_{power}}{P_{gas}} = \frac{95\%}{70\%} = \mathbf{1.36}$$

POWER / GAS PRICE RATIO

 **<1.36x** → Electric attractive

1.36x → Efficiency break-even

 **1.36--~2x** → CO₂ / flexibility become decisive

 **>~2x** → Gas increasingly difficult to beat without additional benefits

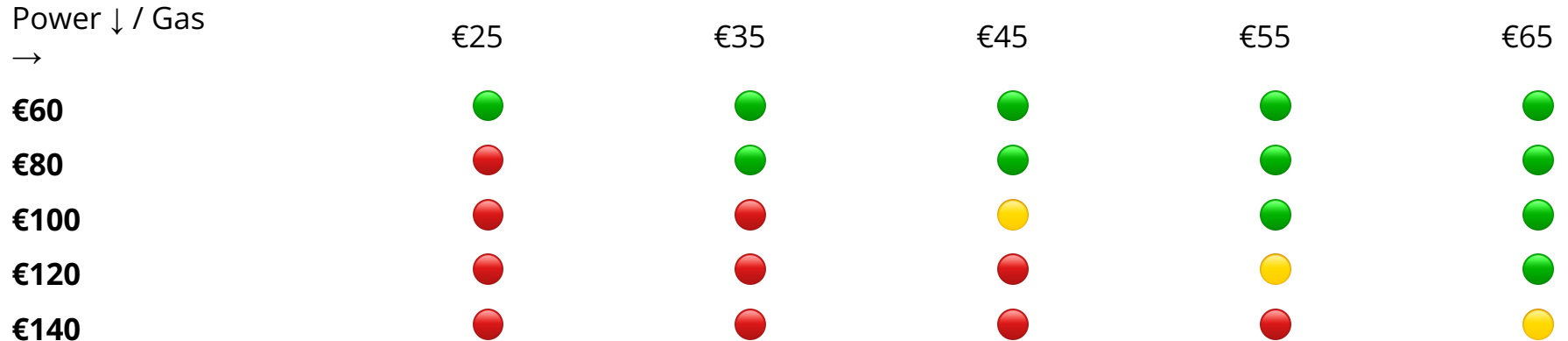
CO2 ADDS COMPLEXITY

- For natural gas, approximately: 0.202 tCO₂/MWh gas
- At an illustrative EUA price of **€80/tCO₂**: 0.202×€80=€16.2/MWh gas
- At 70% furnace efficiency: €16.2/0.70=€23/MWh useful

	Gas €30	Gas €40	Gas €50
Gas energy cost / useful MWh @70%	€43	€57	€71
+ CO₂ @ €80/t	+€23	+€23	+€23
Effective gas heat cost	€66	€80	€94
Equivalent electricity price @95% efficiency	€63	€76	€89

HEAT MAP EXAMPLE OF POWER TO GAS

finding the technology with conversion factor, adding capex costs to the equation, will produce a formula and a heat map of attractiveness of electrification in relation of gas and power prices.



TECHNOLOGICAL COMPLEXITY OF ELECTRIFICATION

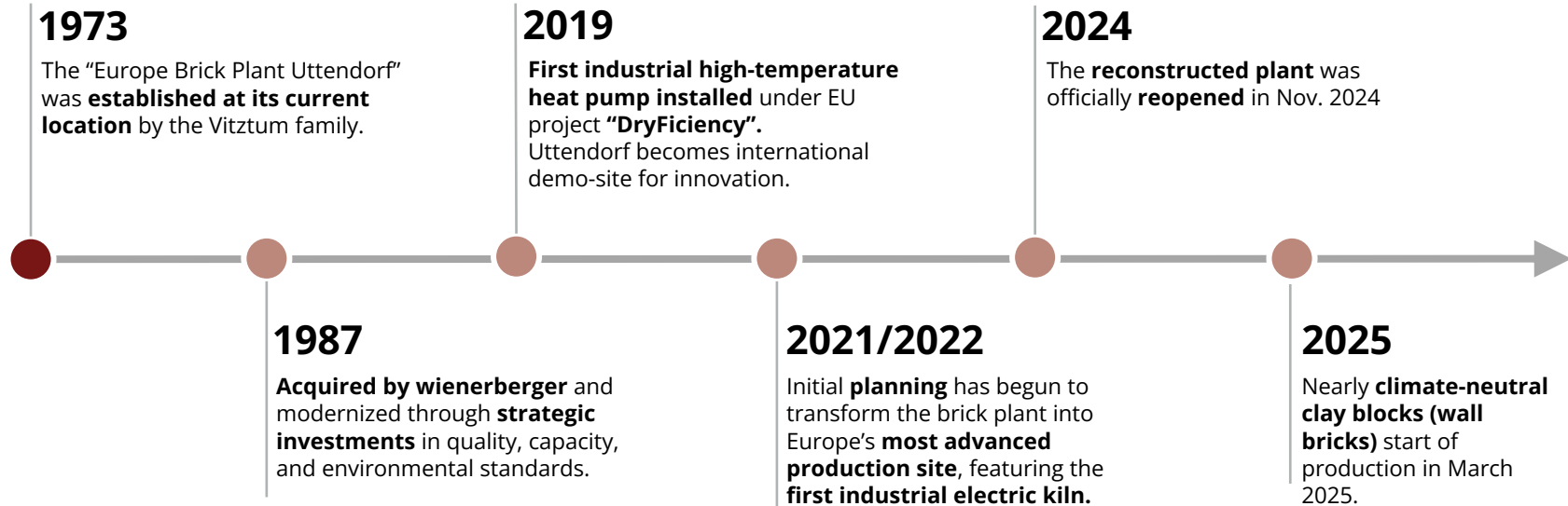


Technology	Replaces	Typical applications	Key economic feature
Industrial Heat Pumps	Gas boilers / gas-fired heat	Hot water, drying, low-temp process heat	COP 2-5 → major efficiency gain
Electric Boilers	Gas-fired boilers	Steam, hot water, process heat	~95-99% efficiency; flexible
Resistance Heating / E-Furnaces	Gas-fired furnaces, kilns, ovens	Metals, glass, ceramics, heat treatment	~90-100% electrical efficiency
Induction Heating	Gas furnaces / burners	Melting, forging, metals, heat treatment	Fast, precise, efficient
Electric Arc / Plasma Heating	Fossil-fired high-temperature processes	Steel, metals, specialty processes	Very high temperatures
Infrared / Microwave / RF Heating	Gas-fired drying/heating	Drying, curing, food, chemicals	Direct/product-specific heating

PLANT UTTENDORF



HISTORY OF THE UTTENDORF BRICK PLANT



KEY FIGURES & FACTS OF THE PROJECT

Renovation period:

Spring 2022 to Autumn 2024

Project lead: Gerhard Pichler, Rene Pesendorfer

Scientific partner:

Austrian Institute of Technology

Suppliers (selection):

ONEJOON (Electric Kiln),

Sabo (Robots),

TecnoFerrari (Automatic Guides Vehicle)



CO₂ reduction:

up to 90% compared to the previous kiln
($\approx 7,340$ tons/a = 600 car trips around the globe)

Energy savings (kWh/ton, thermal):

$\sim 40\%$ compared to the previous kiln

Total renovation investment:

30 mEUR, whereof 7mEUR funding

Additional upgrades:

New sawdust preparation &
3 new heat pumps installed

BACKGROUND - DRYING PROCESS

Heat Pump Technology

- › **Recovery of energy** from the dryer exhaust air
- › **Generation of hot water** for dryer heating
- › **3 heat pumps** installed with COP of 3.7 *)
(COP - Coefficient of Performance)

*) COP is the ratio of heat output to electricity input; a COP of 3.7 means the system delivers 3.7 kWh of heat for every 1 kWh of electricity consumed.



BACKGROUND - FIRING PROCESS

Electric High Efficiency Kiln

- › **New tunnel kiln with enhanced efficiency:** 85 m long with full electric heating (heating elements in kiln deck and side walls)
- › **Energy sources for the electric kiln:** from own 1 MW photovoltaic system and purchase of certified green electricity
- › **Kiln temperature:** approx. 960 °C
- › **Firing time:** ~10 hours (depending on product)
- › **Production output:** (~2,600 Single-Family-Houses per year)
- › **Concept** based on Wienerberger patent



HIGHLIGHTS & IMPRESSIONS - UTTENDORF



**1-Megawatt
Photovoltaic
System**

**Automated
Brick Transport
System**



HIGHLIGHTS & IMPRESSIONS - UTTENDORF



Fully Automated
Production



HIGHLIGHTS & IMPRESSIONS - UTTENDORF

Complete renewal
of the electrical
infrastructure

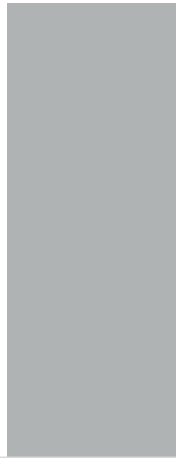


POROTHERM PLAN E

POROTHERM PLAN E – THE FUTURE OF SUSTAINABLE CONSTRUCTION

Porotherm 50 W.i. Plan

119.3
kg CO₂/m²



~ 42
kg CO₂/m²



Standard

New "E"

Standard production, based on natural gas

Porotherm 25 Plan

37.2
kg CO₂/m²



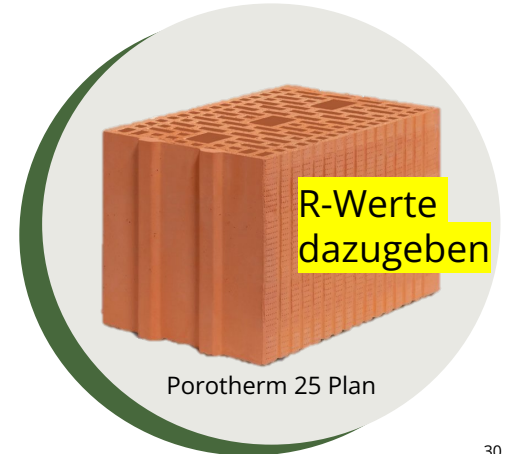
~ 10
kg CO₂/m²



Standard

New "E"

Uttendorf concept, 100% electric



POROTHERM PLAN E: MEETING TOMORROW'S BUILDING STANDARDS

- **Regulations towards building materials** in terms of sustainability and their carbon footprint are getting increasingly strict.
(Energy Performance of Buildings Directive)
- **Public awareness** of ecological living and sustainable building is steadily increasing.
- A preliminary **EPD** (Environmental product declaration) is already available, with the final version expected by the **beginning of 2027** after full year production in 2026 in Uttendorf.



TAKE AWAYS FROM ELECTRIFICATION ECONOMICS

Comparing €/MWh of gas and electricity alone is misleading

- › **Efficiency matters:** compare the cost of **useful heat**, not simply the purchased energy price. Electric technologies can achieve significantly higher conversion efficiency than gas.
- › **Technology choice matters:** electrification offers a broad range of solutions — from heat pumps and electric boilers to resistance, induction and arc heating.
- › **The most sophisticated technology is not always the best solution:** economics depend on **temperature, process requirements, operating profile and flexibility**.

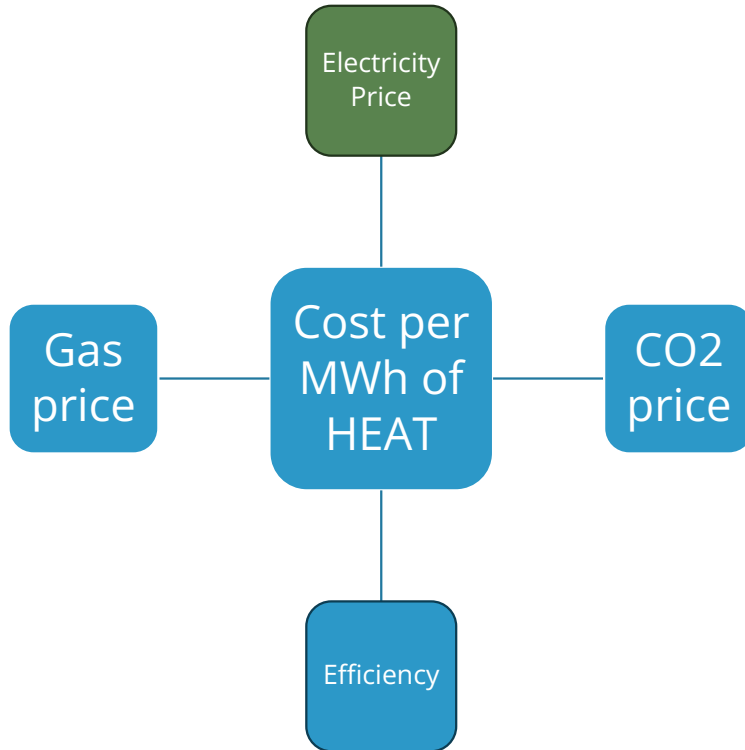
Further investment considerations

- › **CAPEX can be substantial** — electrification may require a full plant retrofit, with investments potentially reaching **tens of millions of euros**.
- › **State aid can be critical** to achieving an acceptable business case and investment return.
- › **Grid capacity & permitting can become the real bottleneck** — insufficient connection capacity may restrict the achievable electrical load and **delay projects by several years**.

› POWER PRICE COMPETITIVENESS AUSTRIA

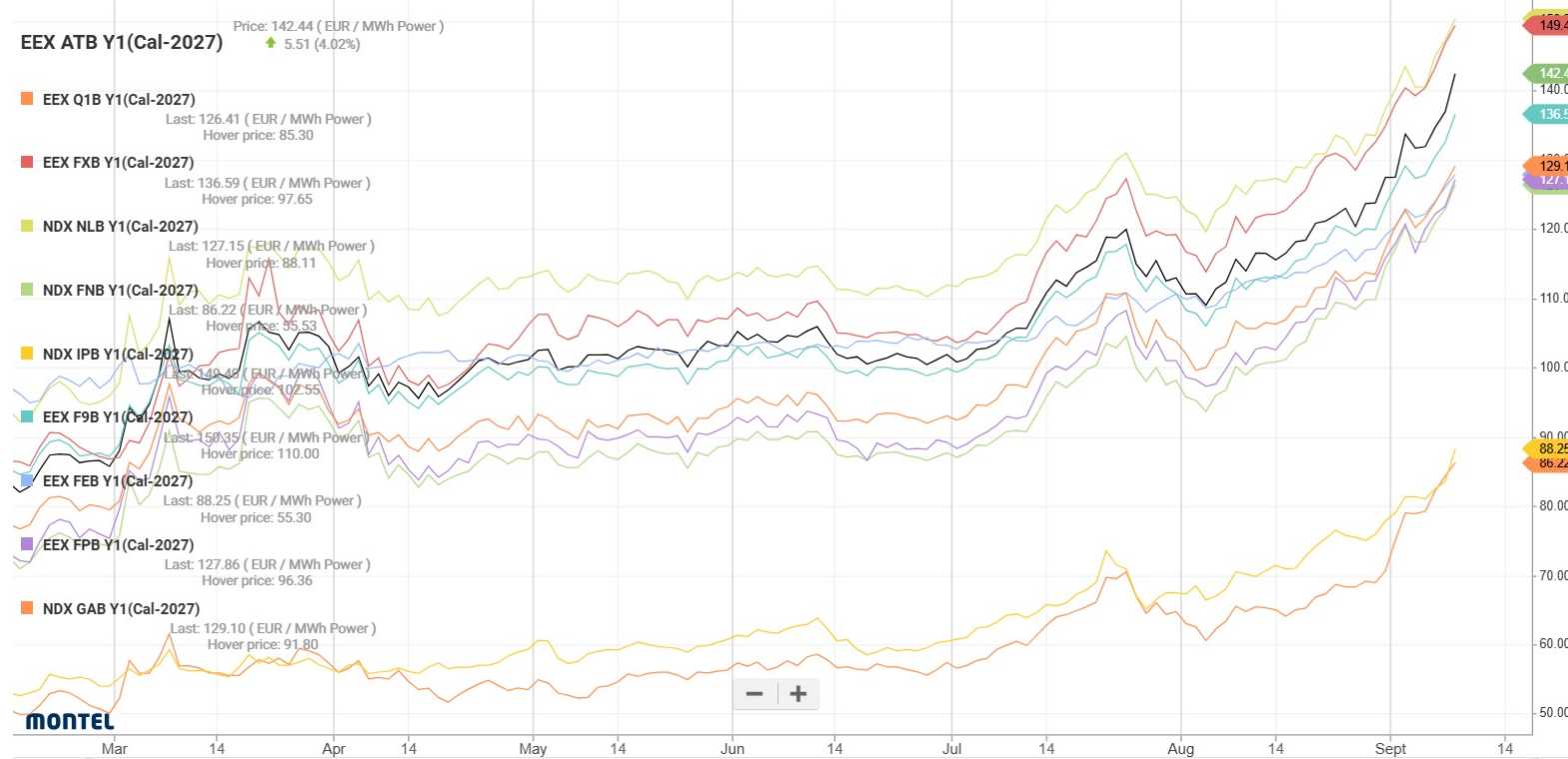


ECONOMICS OF ELECTRIFICATION



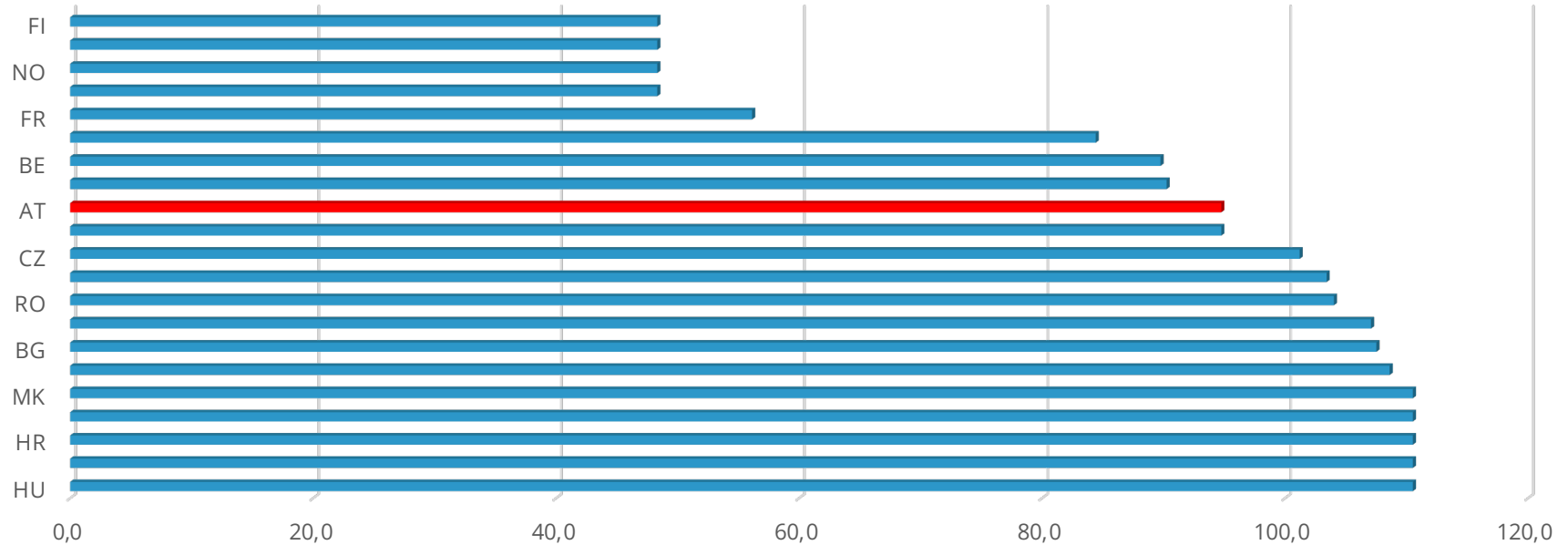
- Single EU CO2 price
- Very similar natural gas price
- Efficiency depends by technology and not region
- Competitiveness in electrification depends on the availability and price of electricity.

WHERE IS CHEAP ELECTRICITY (BASELOAD PRICE CAL 27 COMP)

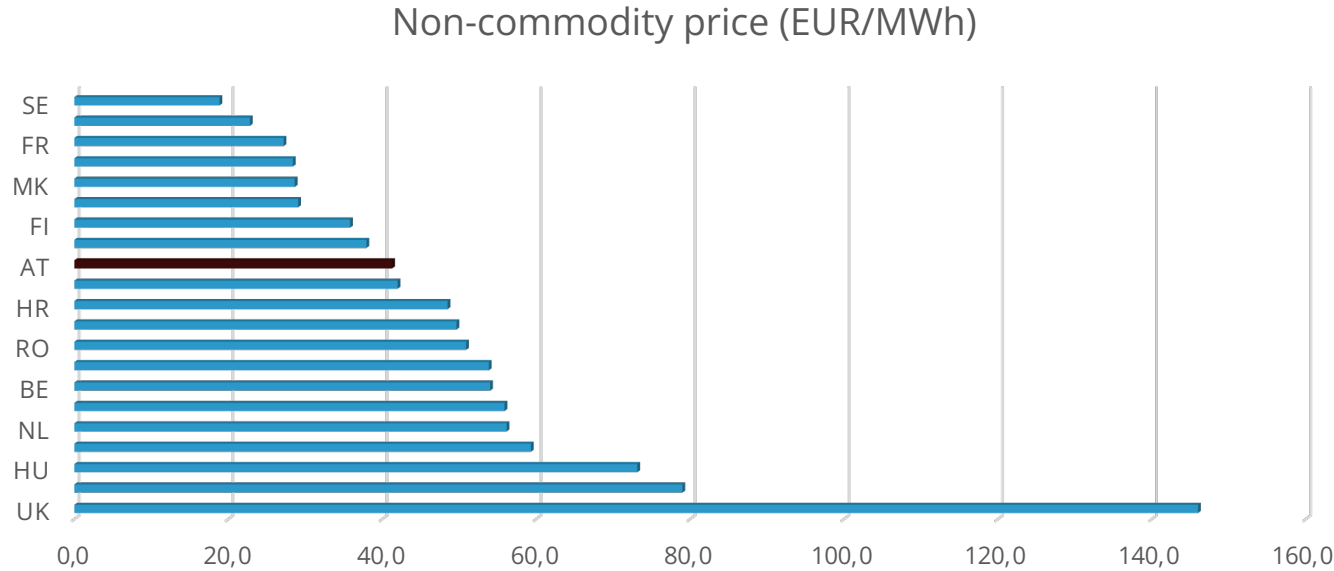


COMMODITY PRICE – WB USER CASE

Commodity pure market price 2028 (Market 09.04.) (EUR/MWh)



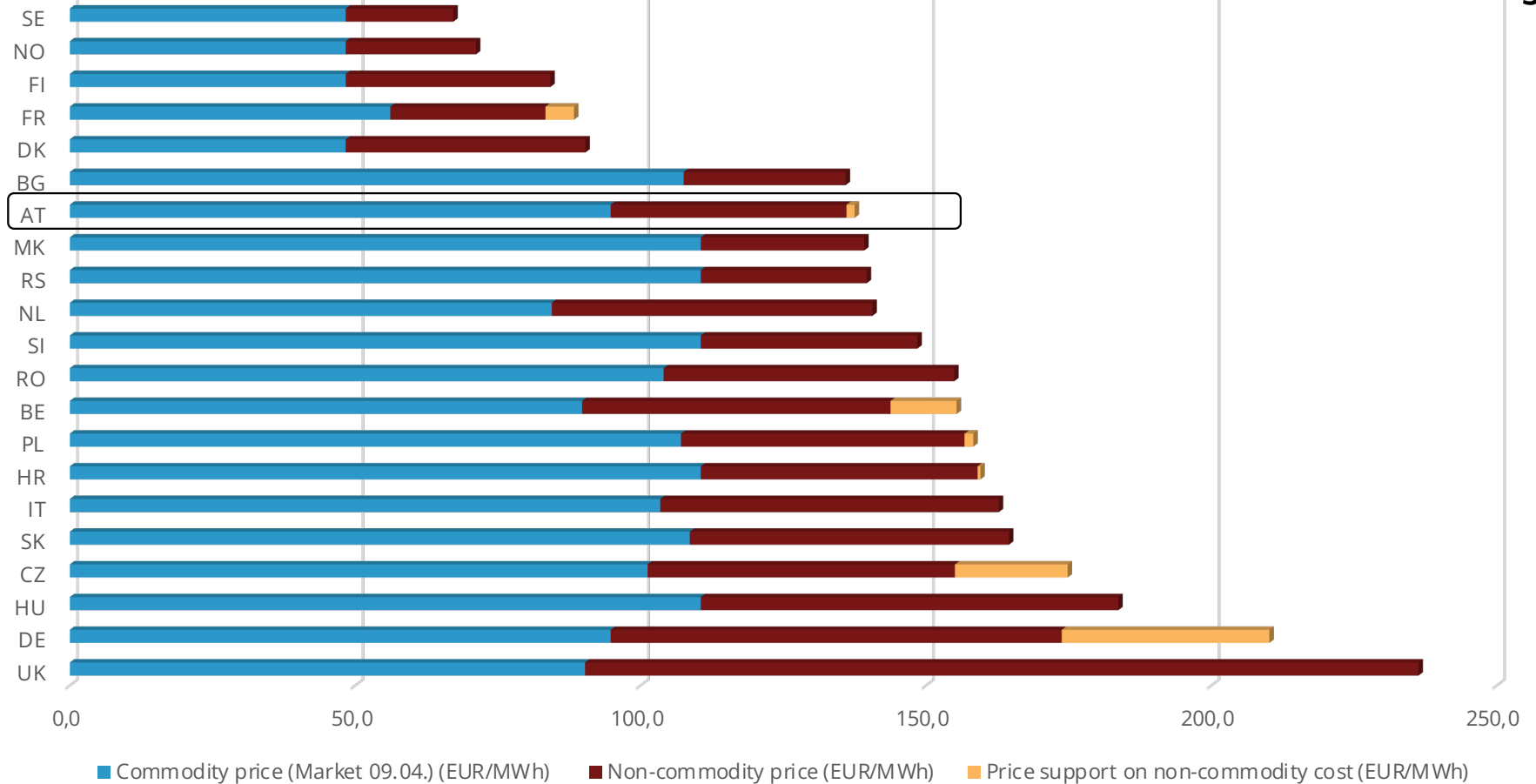
NON COMMODITY COSTS STANDARD PLANT EXAMPLE



Austrian grid tariffs are in simple EU benchmark in the lower half, offsetting part of the higher commodity costs

Austria is in European power costs benchmark in lower half, outperforming large economic and CEE

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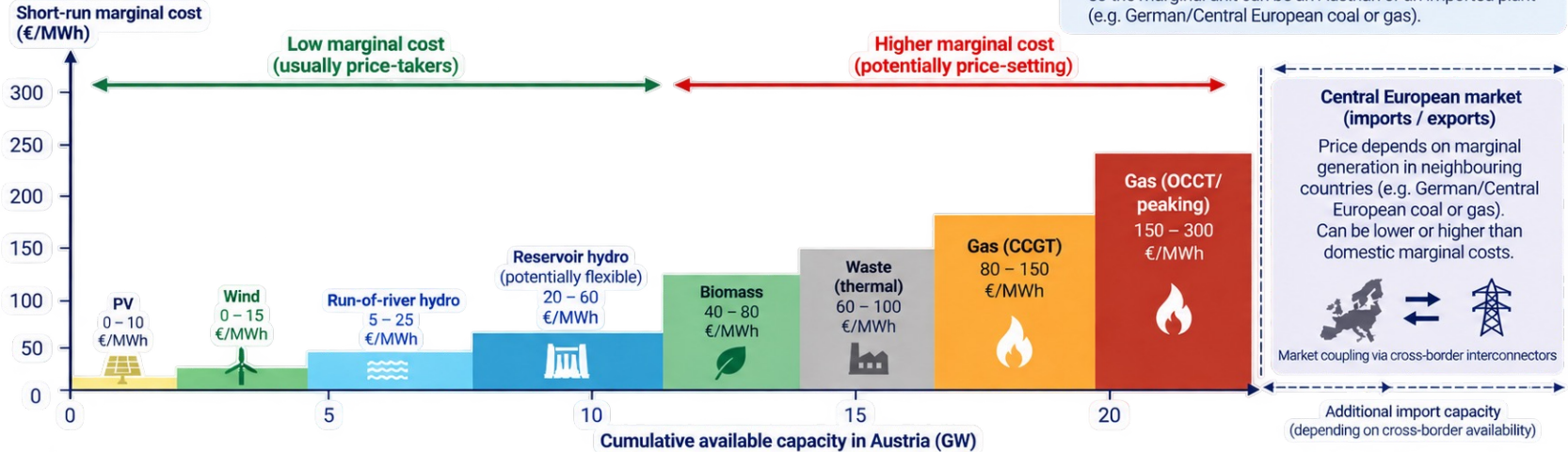
› CAN WE BRING THE COSTS DOWN?



Austria – Electricity merit order (2025)

Low-cost renewables and hydro at the left – gas and imports can set the price

Illustrative short-run marginal costs for existing technologies in Austria, based on 2025 market conditions.
Austria is integrated in the Central European market – marginal units can be domestic or imported.



Austria has no coal and no lignite generation.

- The last coal-fired unit (Mellach) ended coal operation in 2020 and the site is now operated on natural gas (CCGT).
- Electricity generation is based on renewables (mainly hydro), gas, biomass, waste and imports.
- Prices are set in the integrated Central European market, so the marginal unit can be an Austrian or an imported plant (e.g. German/Central European coal or gas).



Renewables set low prices in many hours

PV, wind and run-of-river hydro have very low marginal costs and often set the price, especially during high renewable generation hours.



Hydro provides flexibility

Reservoir and pumped-storage hydro can increase output at higher prices, but their short-run marginal cost reflects the value of stored water (opportunity cost), not just operating costs.



Gas and imports can set the price

In low renewable or high-demand hours, gas-fired plants or imports often determine the market price, linking electricity prices to gas and CO₂ prices.



Demand varies by hour

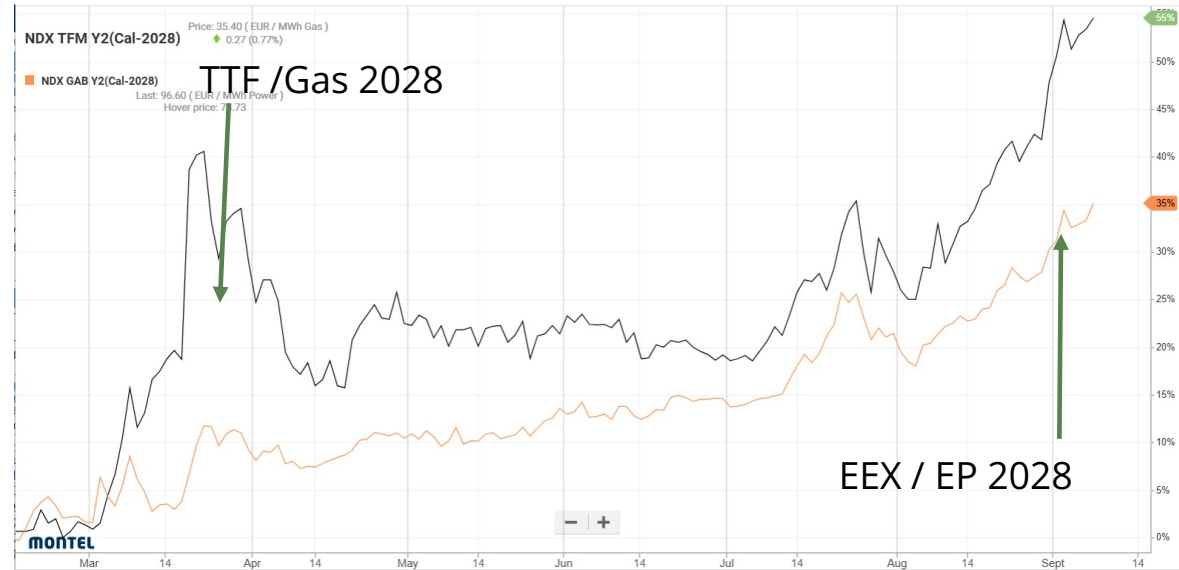
There is no single "average" demand line. Austrian demand varies significantly (e.g. ~5-11 GW depending on hour and season). The marginal unit – and price – depends on the demand and renewable generation in each hour.

Sources: E-Control (Stromkennzahlen 2025), APG (Strombilanz 2025: 5.36 TWh net imports), VERBUND (Mellach), ENTSO-E, market data (fuel and CO₂ prices).
Note: Marginal cost ranges are indicative and based on typical 2025 conditions (fuel prices, CO₂ prices, efficiency and variable O&M). No coal or lignite in the Austrian generation mix.

Illustrative chart for presentation purposes only.

CAN THE POWER MARKET FALL IN AUSTRIA

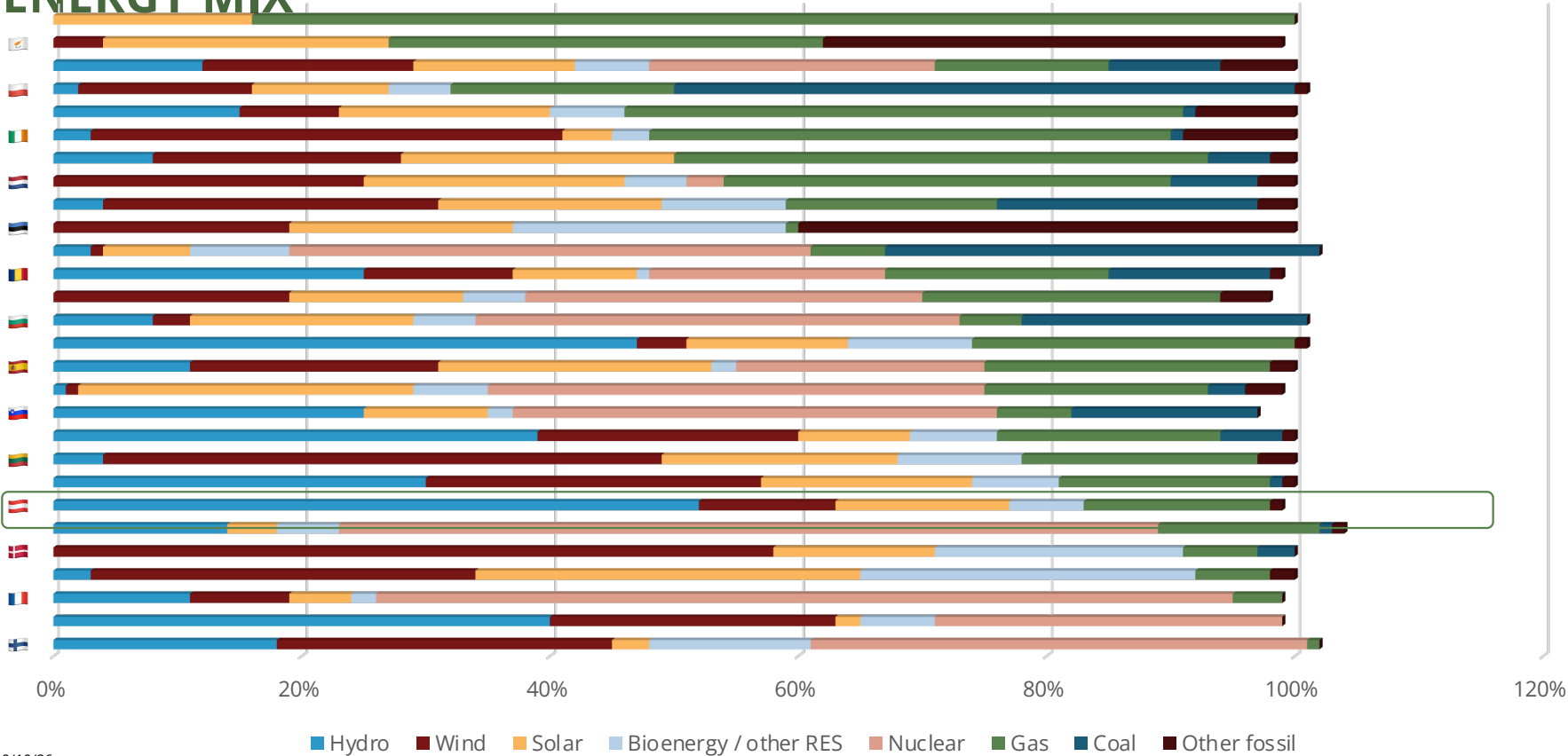
- Power prices closely follow gas-price movements when gas-fired generation is marginal — recently amplified by the Strait of Hormuz crisis.
- A normalization of gas flows would put downward pressure on both gas and electricity prices.
- Austria remains exposed to gas-driven power pricing: during low-renewable / high-demand hours, gas-fired generation or imports from gas-influenced neighboring markets can set the marginal electricity price.
- This creates a challenge for electrification economics: falling gas prices tend to reduce power prices as well, limiting the improvement in the power-to-gas price ratio.



› WHAT CAN BE THE NEXT COMPETITIVE ADVANTAGE



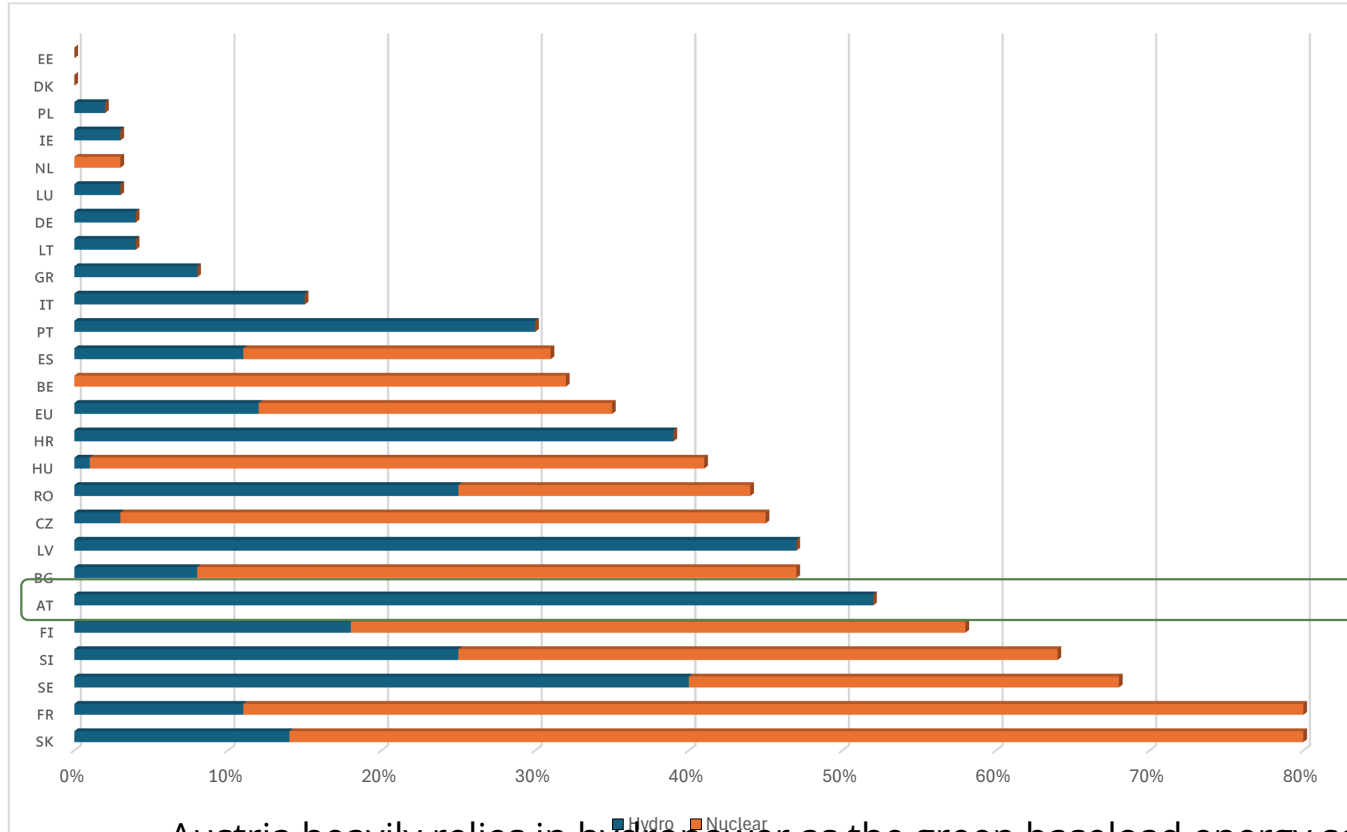
WHAT IS OTHER ADDED VALUE OF AUSTRIA – GREEN ENERGY MIX



ENERGY MIX CONSIDERATIONS

- › Energy Mix Austria is strongly decarbonized and aims to be 100% carbon free in 2030
- › Is the mix however healthy for decarbonization of industry with most of its production relying on weather
- › Will it be good enough for the new GHG protocol and its string requirements?

BASELOAD GREEN ENERGY SOURCES



Austria heavily relies in hydropower as the green baseload energy source

HYDROPOWER IS LOSING RELIABILITY



Paks Nuclear Power Plant with the partially dried-up Danube riverbed in Dunaszentbenedek, Hungary *(Reuters)*

AUSTRIA – COMPETITIVE POSITION FOR INDUSTRIAL ELECTRIFICATION

Austria has a competitive starting position...

- › **Competitive total power costs** versus several Western and Eastern European neighbors, supported by comparatively favorable **grid fees and taxes** for industrial consumers.
- › **High renewable generation**, particularly hydropower, provides a strong basis for low-carbon industrial production.
- › **Location advantage for heavy products:** where transport costs are significant, electrified production in Austria can remain attractive compared with relocating production to lower-power-cost regions.

...but important structural challenges remain

- › **Power prices remain strongly linked to gas prices** whenever gas-fired generation or gas-influenced imports are marginal.
- › Austria's high renewable share is **weather-dependent**, creating challenges for industrial consumers if GHG accounting increasingly moves toward **hourly matching / 24/7 carbon-free electricity**.
- › **Changing hydrological conditions increase uncertainty around hydro availability**, weakening the predictability of Austria's traditional renewable advantage.

WHAT AUSTRIA NEEDS

A larger, reliable block of 24/7 low-carbon power

- Increase availability of competitively priced electricity
- Reduce the frequency with which gas is marginal
- Enable **24/7 low-carbon industrial production**
- Strengthen Austria's competitiveness as an **electrified industrial location**

Austria has a strong renewable foundation, but renewable share alone is not enough — industrial electrification requires competitive, reliable and increasingly hourly-matched low-carbon power.

› LAST ...IS CUSTOMER READY TO PAY THE PRICE...

- Can electrified product be paid?
- Equal treatment for every producer in all EU is necessary to boost electrification
- Counting of CO2 on product usage is essential to determine which products require decarbonized production (long use vs single use)
- Protection of EU green products against non-EU brown products is essential to motivate companies investing

