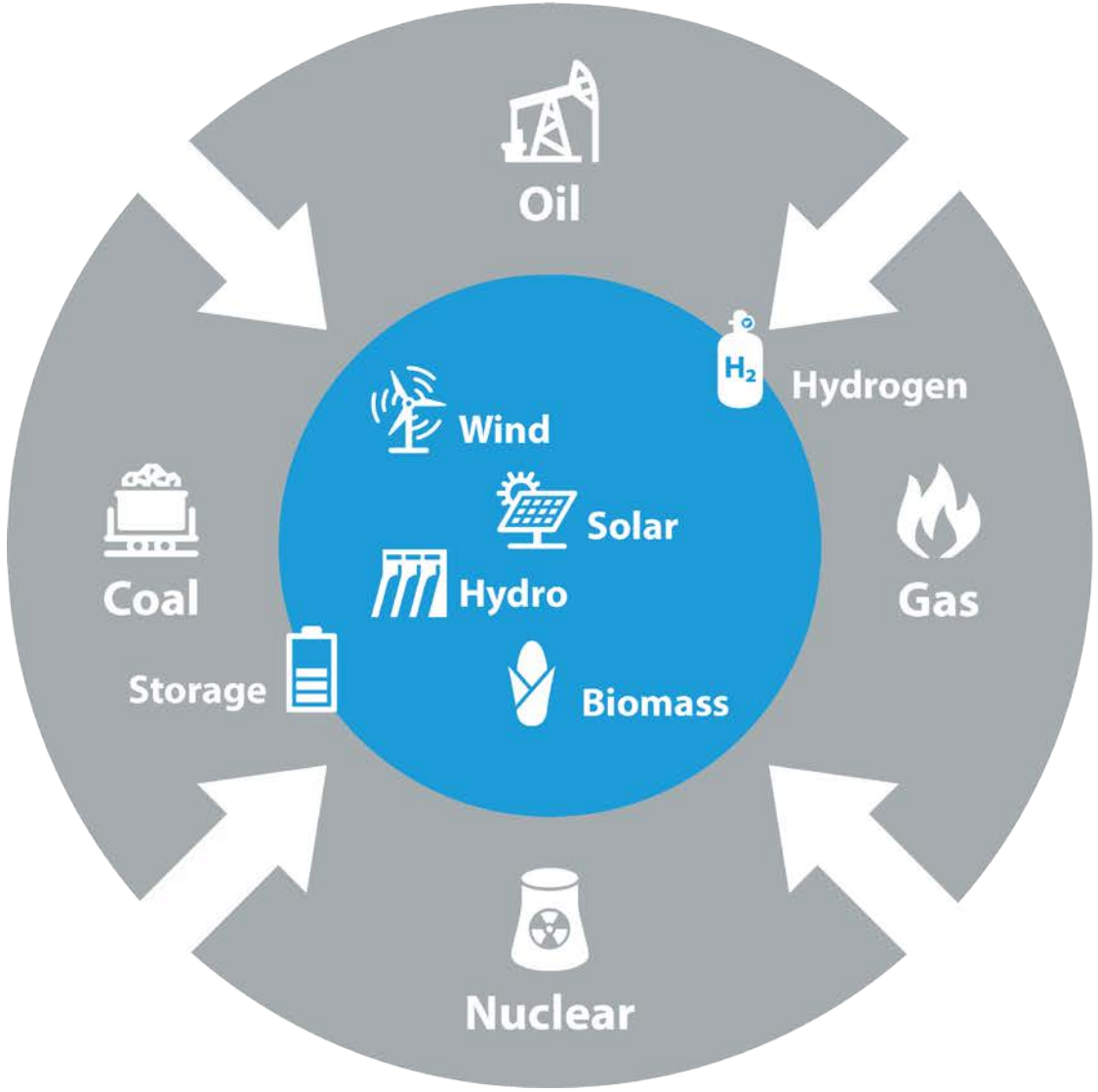
12th EEMI Bauhaus
Stepping Towards Real Performance and Metered Energy Efficiency

1 Decarbonisation Constrains Our Energy System

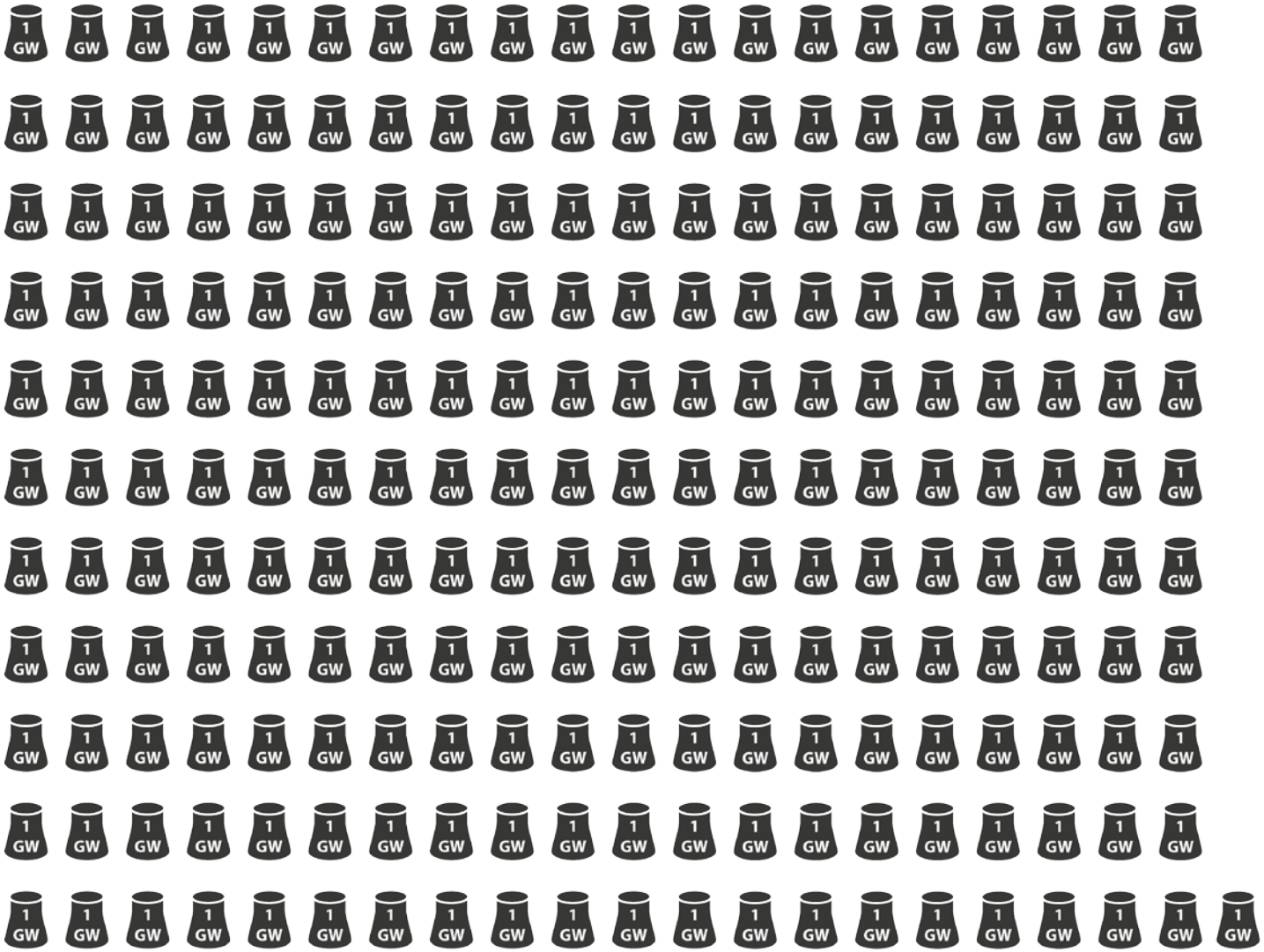


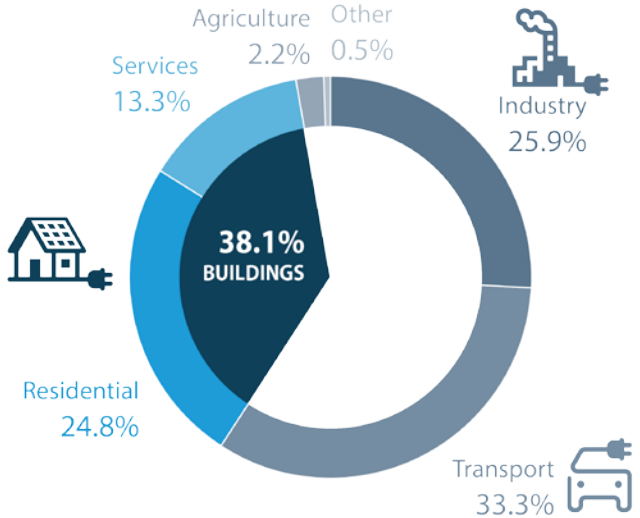
MAJOR ENERGY TRANSITION

We have to electrify almost everything

- Transport
- Buildings
- Industry

1 Electrifying Heating in Buildings Has Scale Constraints



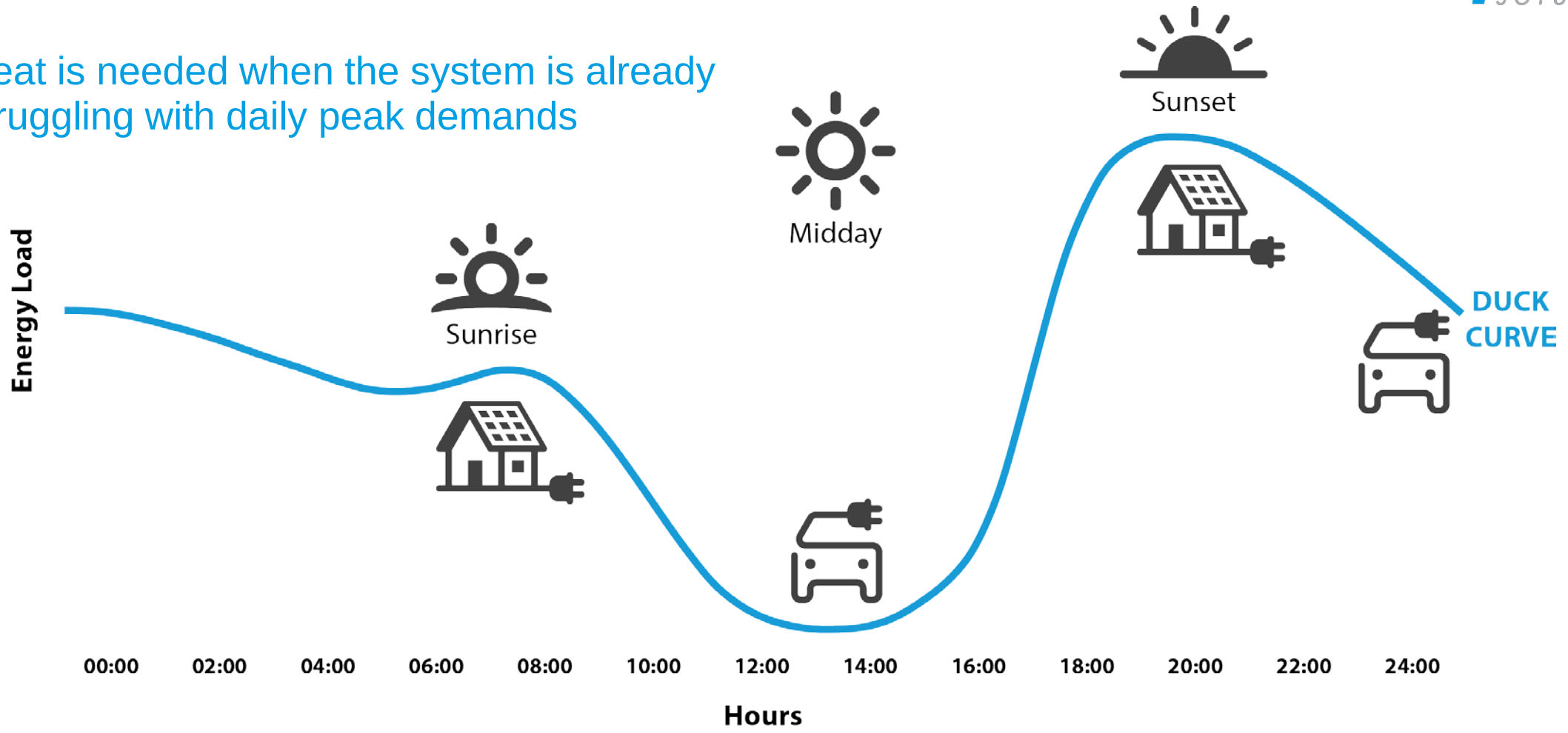


Buildings account for almost **40% of all EU Energy Demand** and are currently primarily supplied through solid fuels

Moving to 70% of current heat being delivered by electricity will increase demand by the equivalent of **221 One Gigawatt Power Plants**

1 Electrifying Heating in Buildings Has Daily Constraints

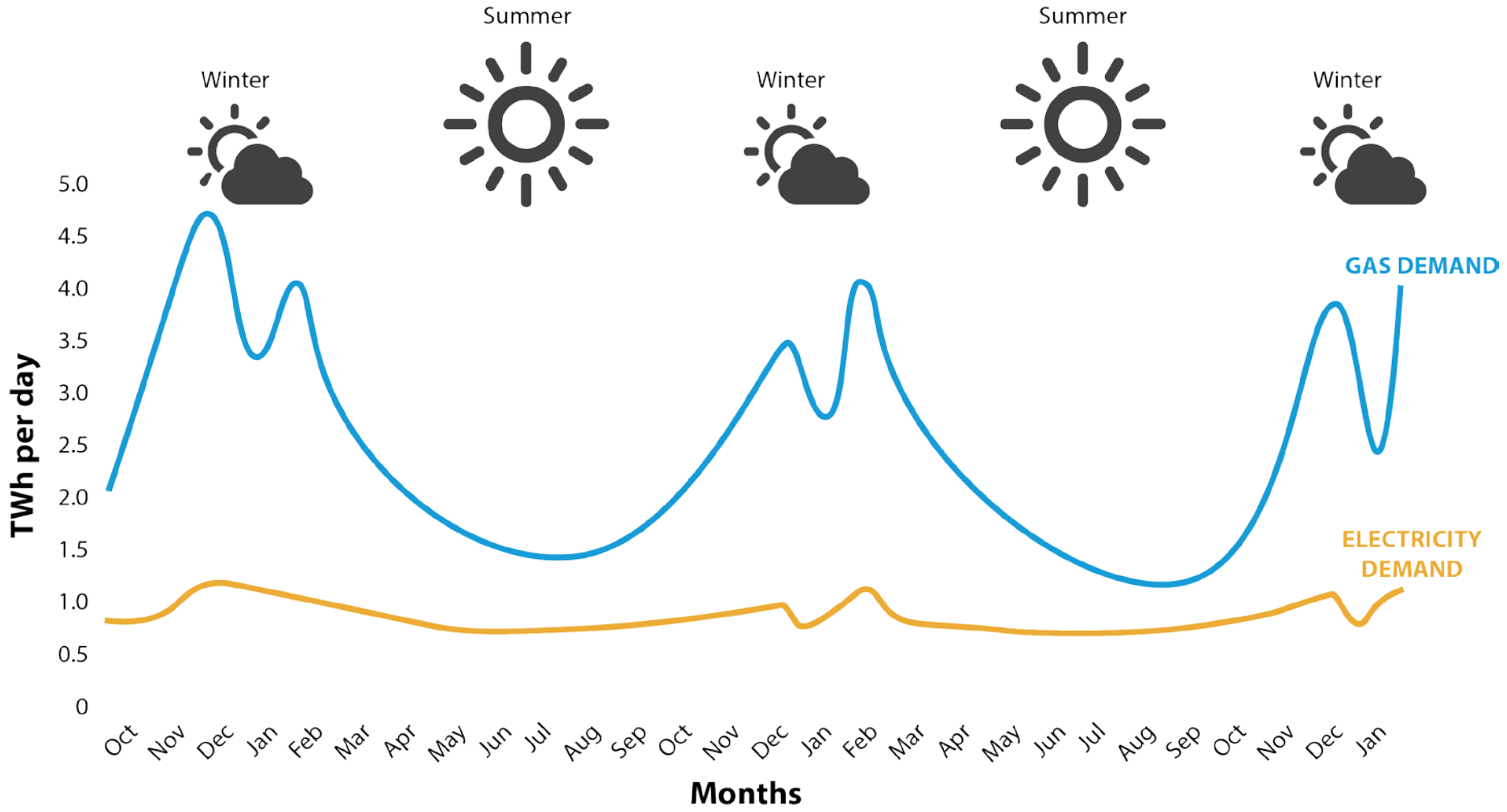
Heat is needed when the system is already struggling with daily peak demands



Electrifying vehicles is less challenging for the electricity supply, as vehicles can be charged off-peak & support grid during peak loads

1 Electrifying Heating in Buildings Has Seasonal Constraints

Heat is needed in winter when solar production is at its lowest



Smart Retrofits Drastically Reduce the Cost of the Transition to Low Carbon and Gas Free Europe

100,000 Smart Retrofits

32.6 tWh of Power Generation

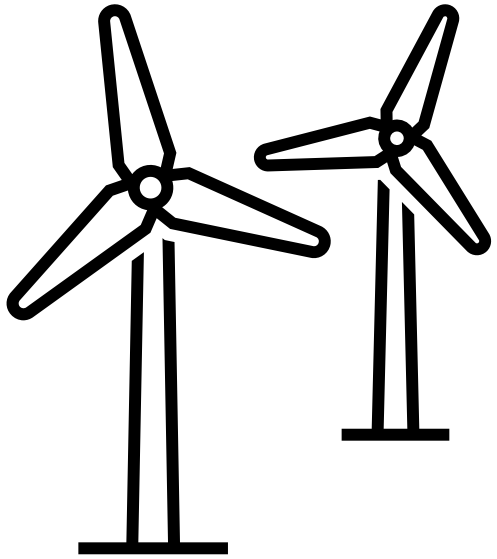
€800 million

€2.65 billion

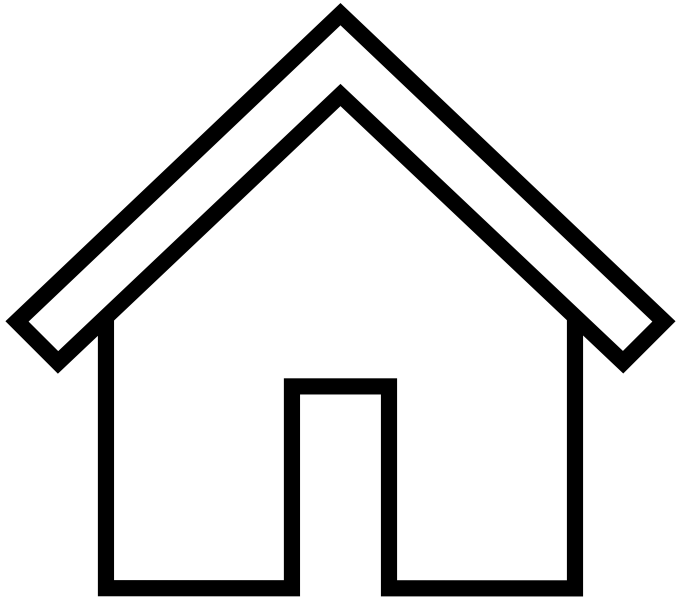
That's 68% Cheaper Than Power Generation

1 Electrifying Buildings Has Market Constraints

1 “The Market for Lemons” Failure



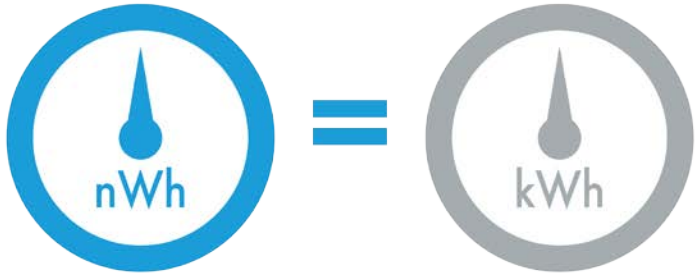
Performance



Measures

2 Technology Breakthrough Resolves Market Failure

FOR THE FIRST TIME
We can meter energy efficiency
the same way as energy generation

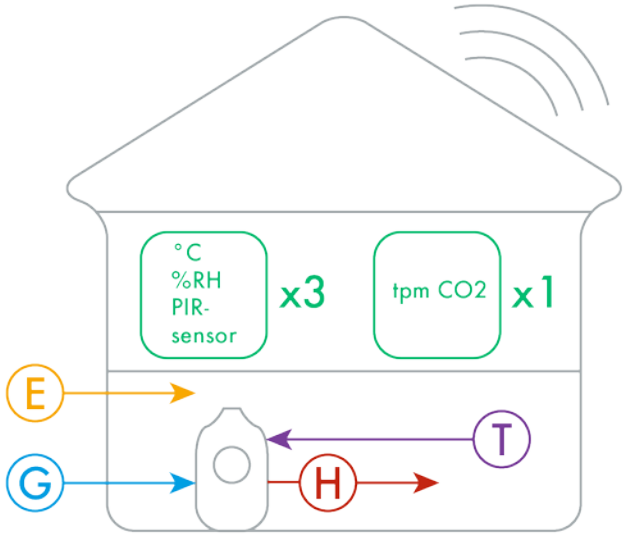


negaWatt hours of energy

kiloWatt hours of energy

Now energy savings can be calculated day-after-day,
fabric energy performance properly benchmarked
& feedback loops provided on design / quality of works

2 Smart Connected Sensors Acquire & Act On Data



E Electricity Meter

G Gas Meter

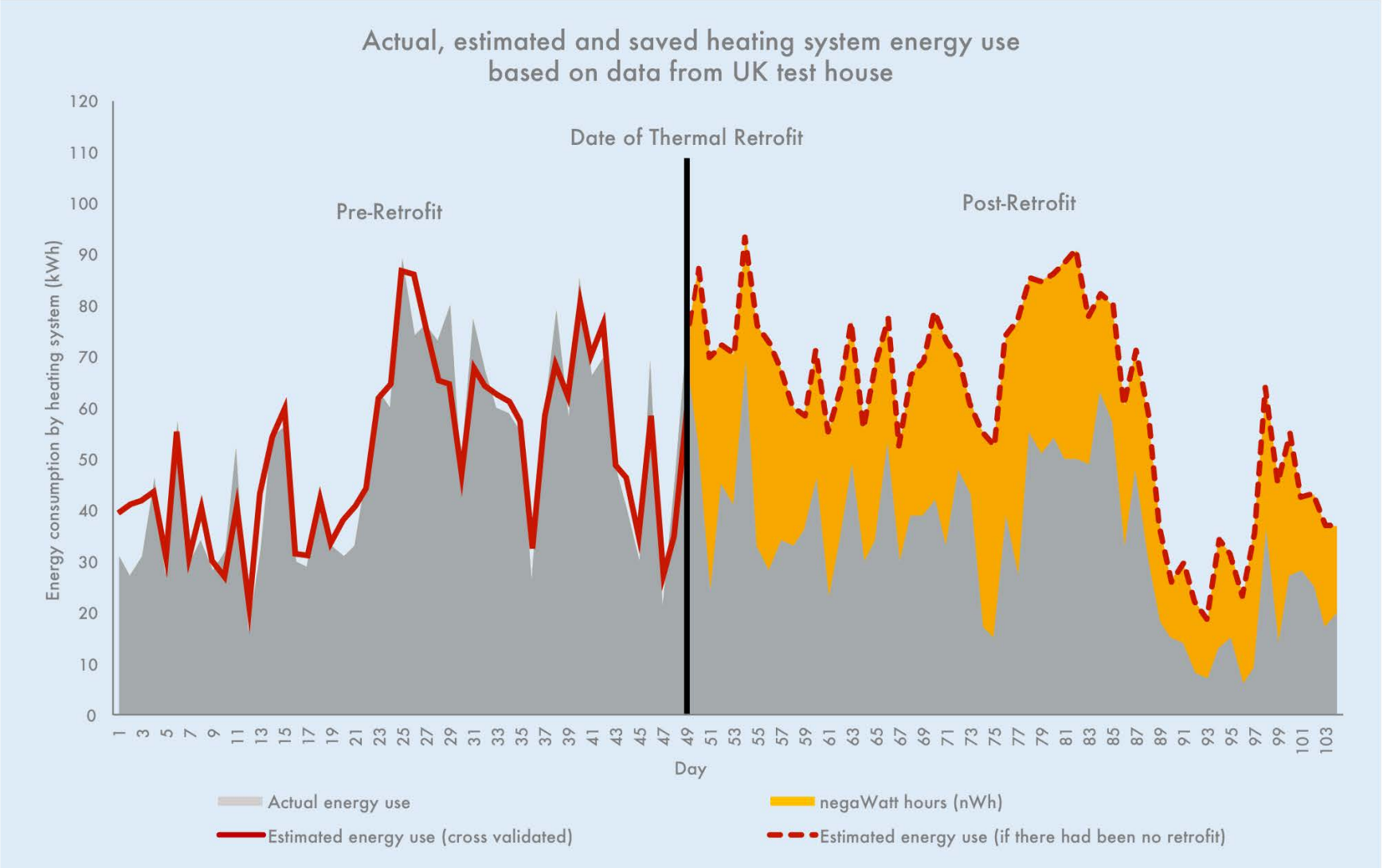
H Heat Meter on Central Heating Circuit

T Smart Thermostat

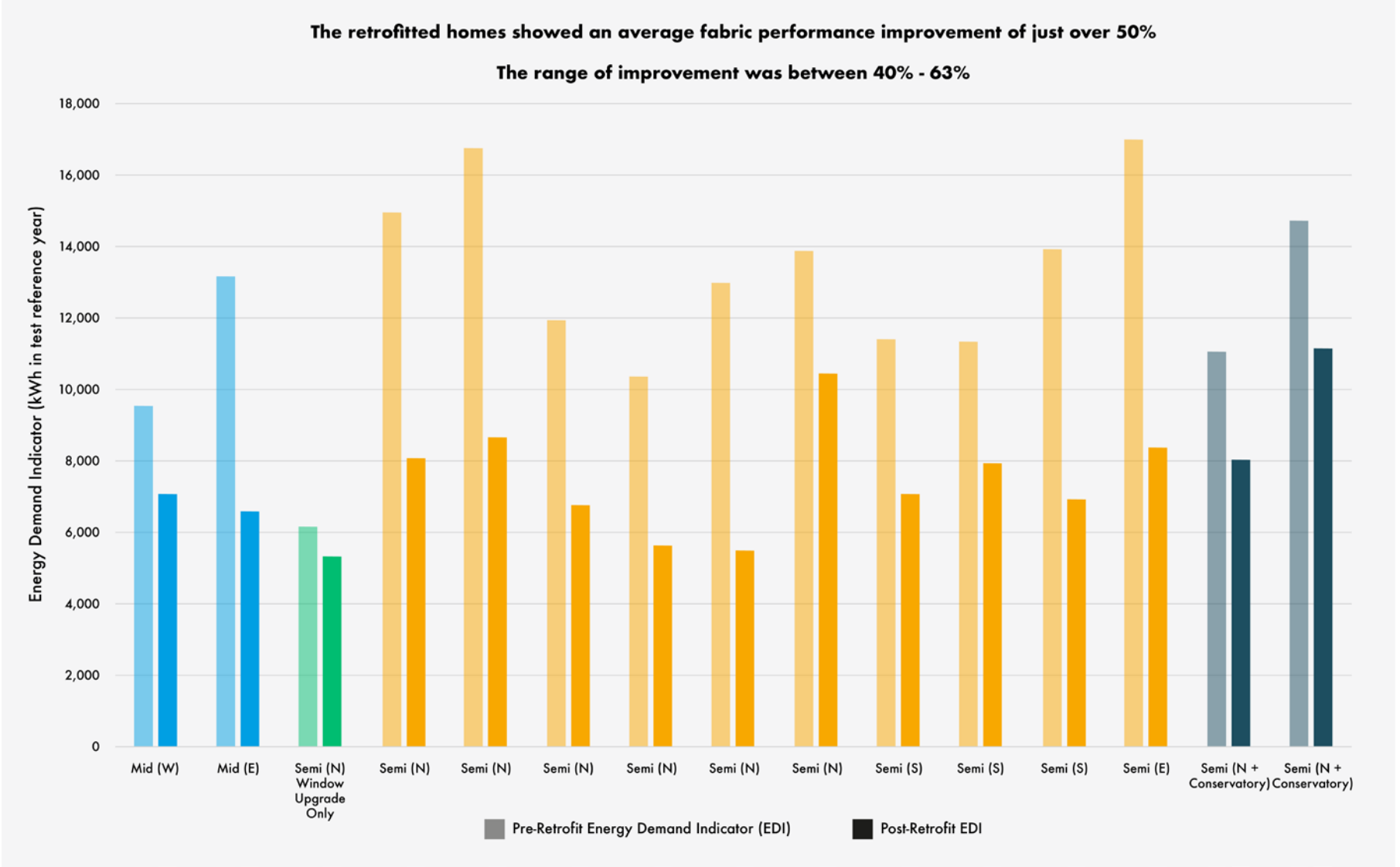
Boiler (supplying domestic hot water and heating on separate circuits)

tpm CO2 Sensor boxes placed in representative zones according to house size and layout

2 Machine Learning Enables NegaWatt Hour (nWh) Meter

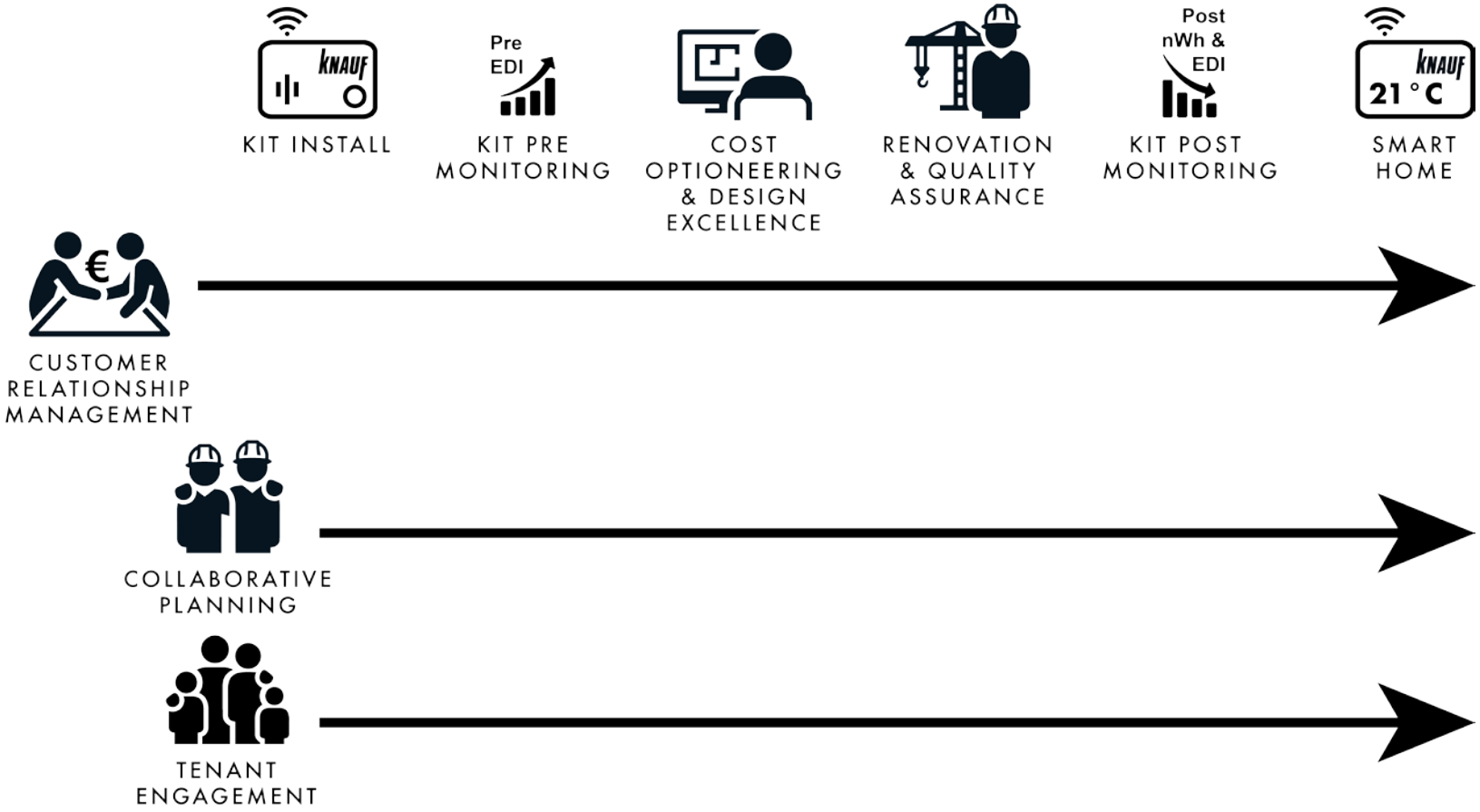


Machine Learning Enables Energy Demand Indicator (EDI)

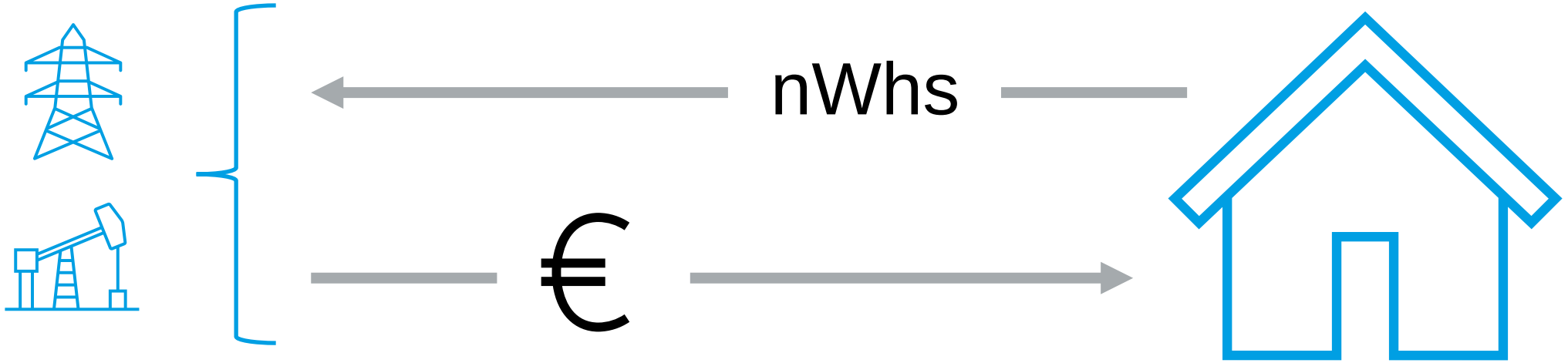


2 Proper Measurement Enables Effective One-Stop-Shops

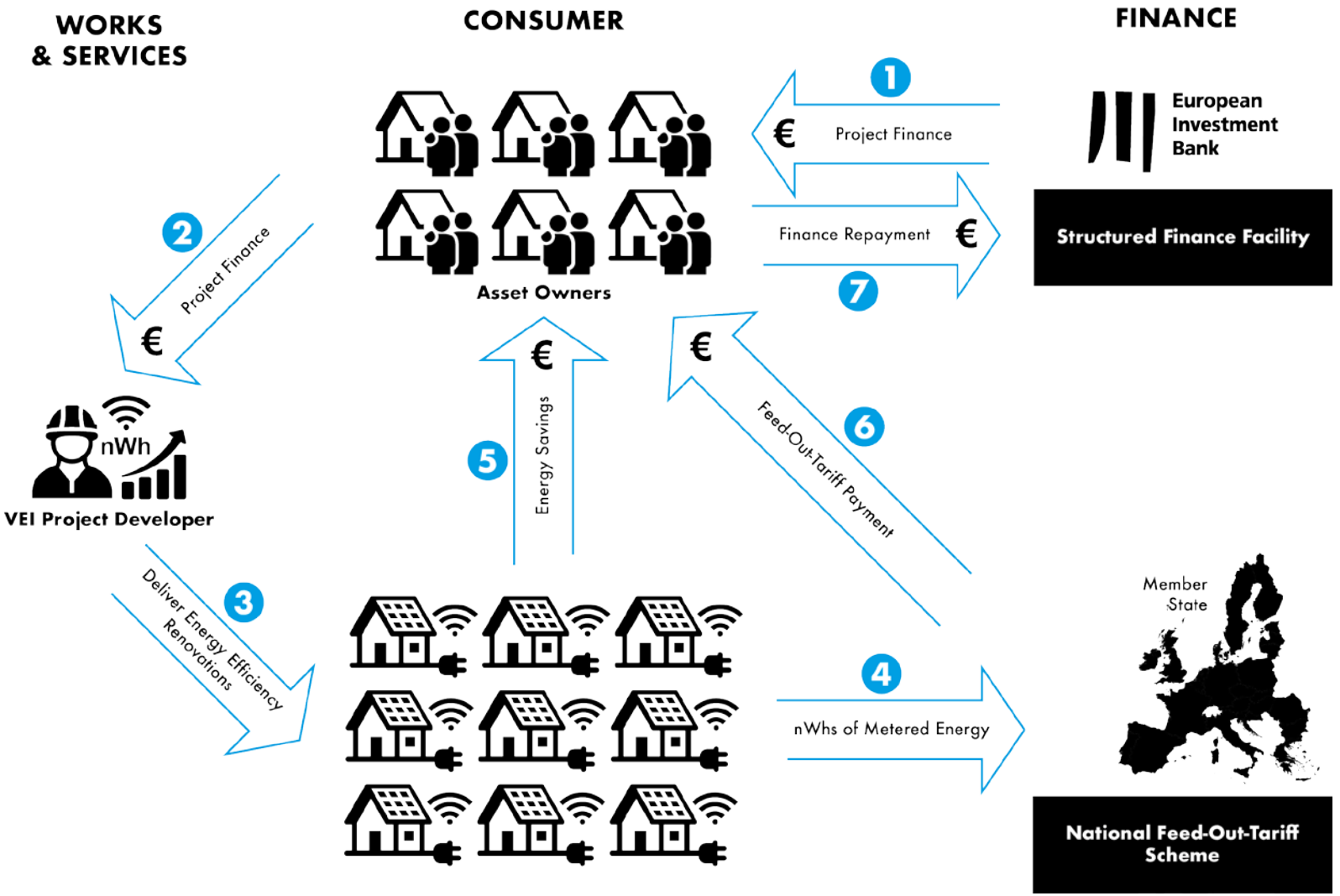
Project development companies, such as Knauf Energy Solutions, are now needed to manage barriers, aggregate demand and deliver scale



Negawatt Hours Allows Pay4Performance Approaches



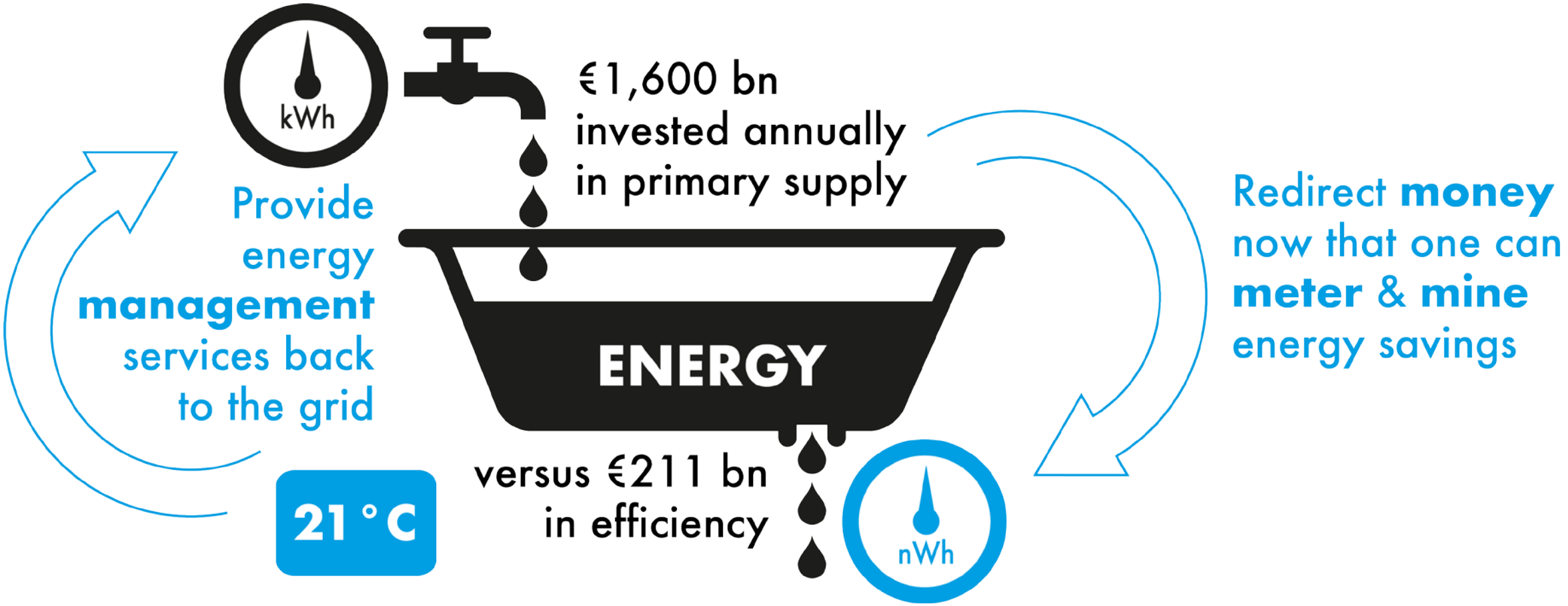
3 Opening-Up New Finance Structures



Feed-Out-Tariffs offer:

- Simplified support based on the real ‘quantum’ of energy saved
- An open ended support structure to upscale residential renovation
- Upfront low interest financing
- Easy bundling of support and finance
- Well suited to private residential market

3 Ushering in 21st Century Energy Companies



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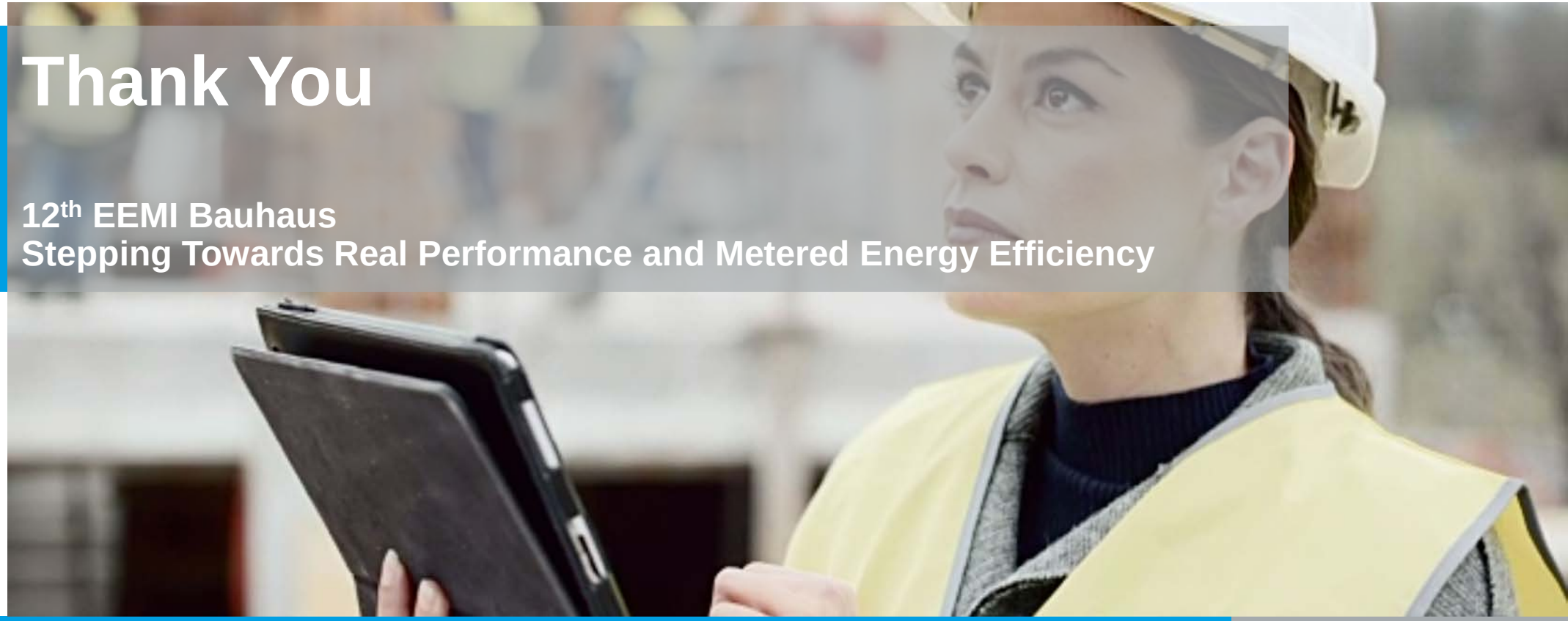
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