

BOSCH TERMOTECNOLOGIA

Global Player in Gas Water Heating



Bosch Termotecnologia Global Player in Gas Water Heating

Bosch Group Facts & Figures

Bosch Group

€ 78.0 billion euros
in sales



400,500
associates



Mobility Solutions

- ▶ One of the world's largest suppliers of mobility solutions



Industrial Technology

- ▶ Leading in drive and control technology, packaging, and process technology



Energy and Building
Technology

- ▶ One of the leading manufacturers of security and communication technology
- ▶ Leading manufacturer of energy-efficient heating products and hot-water solutions



Consumer Goods

- ▶ Leading supplier of power tools and accessories
- ▶ Leading supplier of household appliances

61%



Share of
sales

39%



Bosch Thermotechnology – our business segments



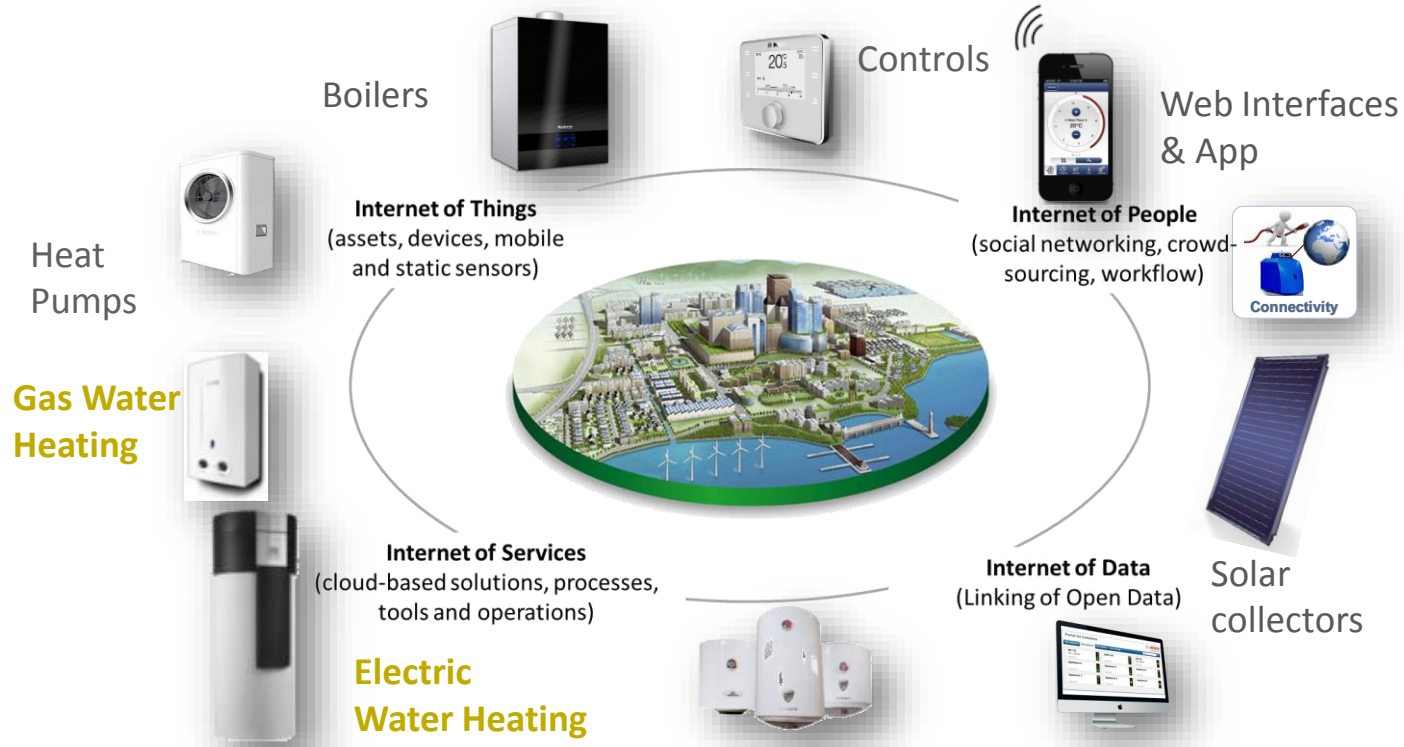
BOSCH
Invented for life

We provide our customers with **simply revolutionary solutions** for a pleasant indoor climate, hot-water supply, and industrial steam generation and energy conversion.



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Product Portfolio of Residential Water Heating




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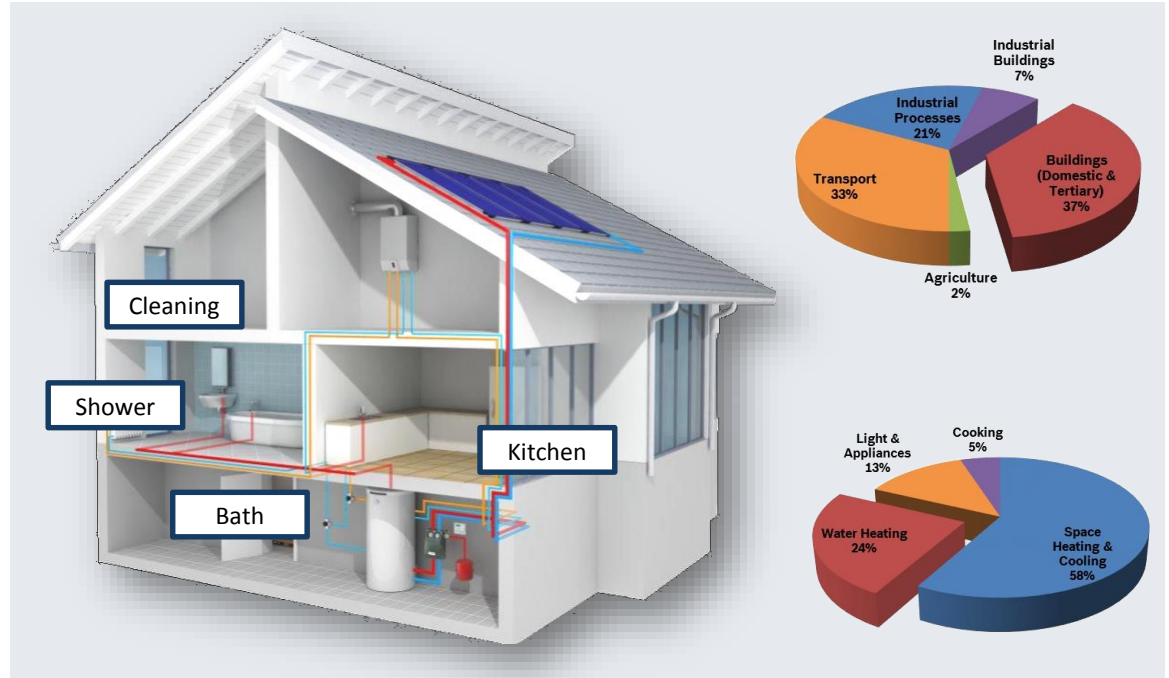
Bosch Residential Water Heating Facts & Figures

 **300 liters**
Daily average consumption

 **12 kWh**
Energy consumption

 **1h00**
Appliance working

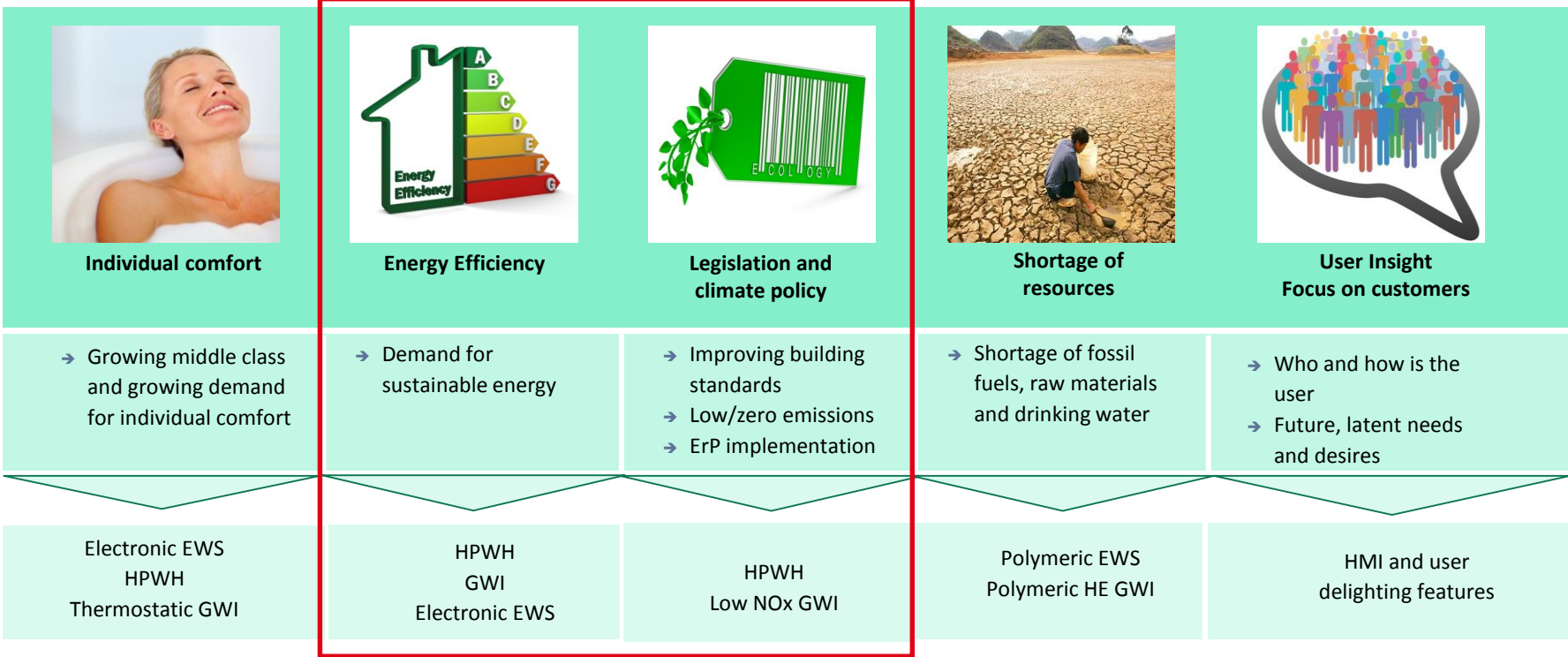
 **1,3 kg**
CO₂ Emissions



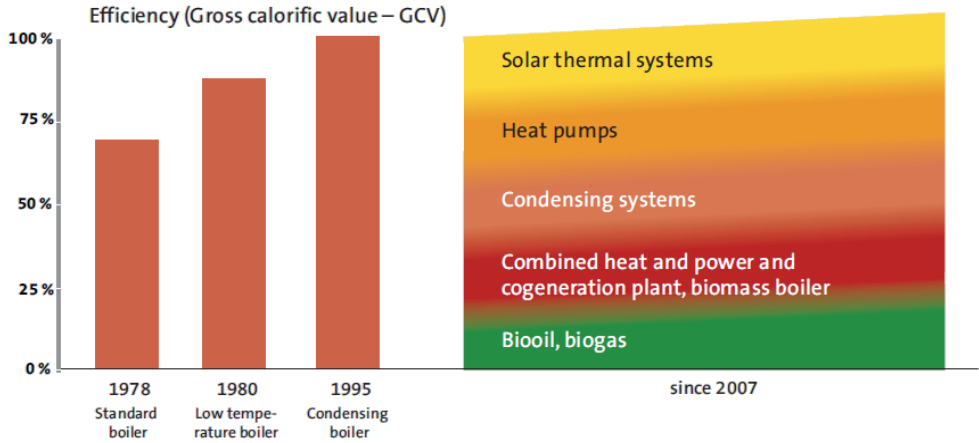
Water heating has a relevant role in domestic energy and water budget

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Bosch Residential Water Heating Drivers



Bosch Thermotecnologia Global Player in Gas Water Heating Efficiency – Historic overview

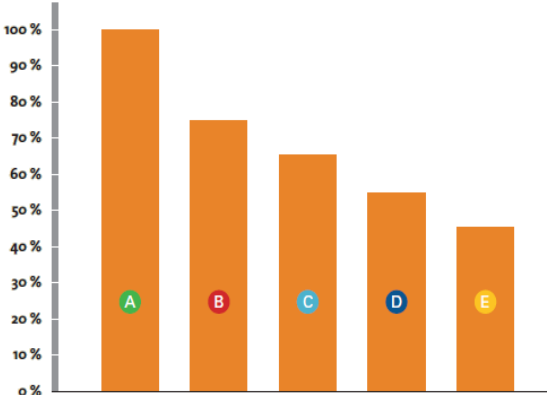


Appliance efficiency Reached near 100% limit 20+ years ago

Further improvements are done at system level

Carbon-dioxide emissions

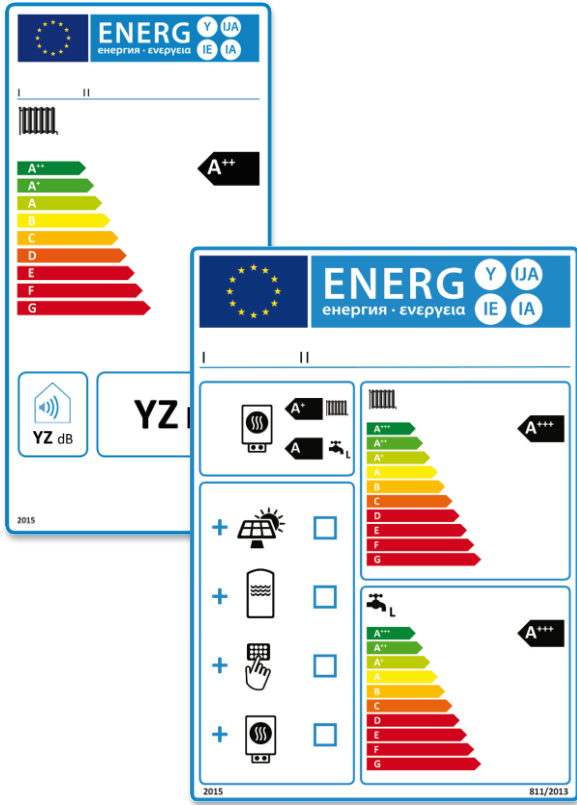
- A** Standard boiler (before 1978)
- B** Low temperature boiler
- C** Natural gas condensing boiler
- D** Natural gas condensing boiler + solar energy (heated drinking water)
- E** Natural gas condensing boiler + solar energy (heated drinking water and supplement to heating)



Bosch Thermotecnologia Global Player in Gas Water Heating Ecodesign



Ecodesign Directive 
 of the European Parliament and of the Council of 21 October 2009



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Ecodesign – Why?

- Changes in the global climate
- Rising environmental pollution
- Growing dependence on the import of fossil fuels
- Rising energy costs in European Union

EU climate protection goals for 2020

20 %

rise in energy
efficiency

20 %

reduction in CO₂






20 %

renewable
energies

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Ecodesign – Efficiency classes

		η_s [%]*	Fuel oil 	Natural gas 	Power 
A+++	From 2019	≥ 150	System only		Brine/water heat pump Water to water heat pump
A++		≥ 125	System only		Air to water heat pump
A+		≥ 98	CHP	CHP / GHP	
A		≥ 90	Condensing boiler\water heater		Direct electric + smart
B		≥ 82	non-condensing boiler\water heater		
C		≥ 75	non-condensing boiler\water heater		Direct electric
D	N/A	≥ 36	non-condensing boiler\water heater		
E	N/A	≥ 34			

* - Depends on Appliance size\power

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Primary energy factor

How is efficiency calculated:

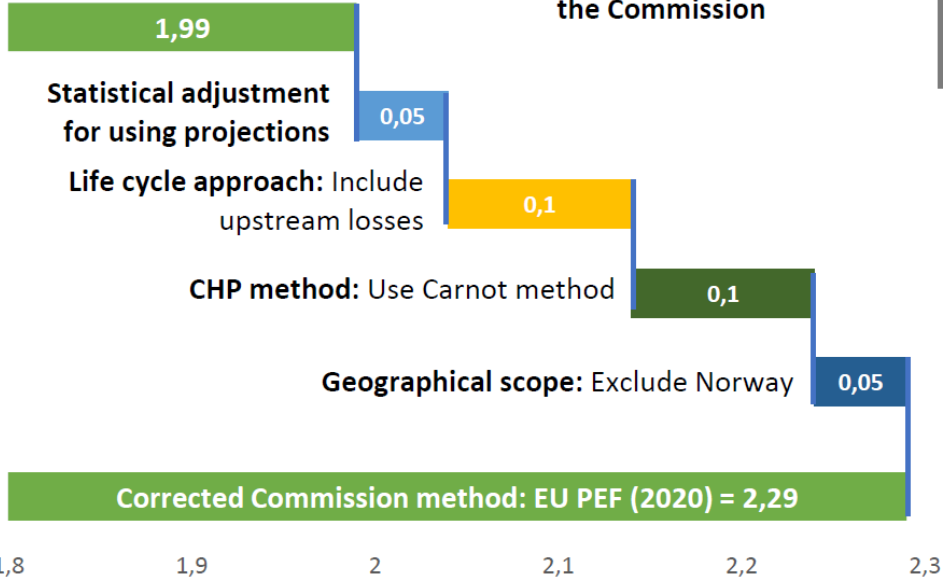
$$\eta_{wh} = \frac{Q_{ref}}{(Q_{fuel} + CC \cdot Q_{elec})(1 - SCF \cdot smart) + Q_{cor}}$$

CC – Is the primary energy factor. Relates electric power to the primary source (gas, coal, ...)

Currently the value is 2.5 which means the maximum power for a direct heating electric appliance is 40%

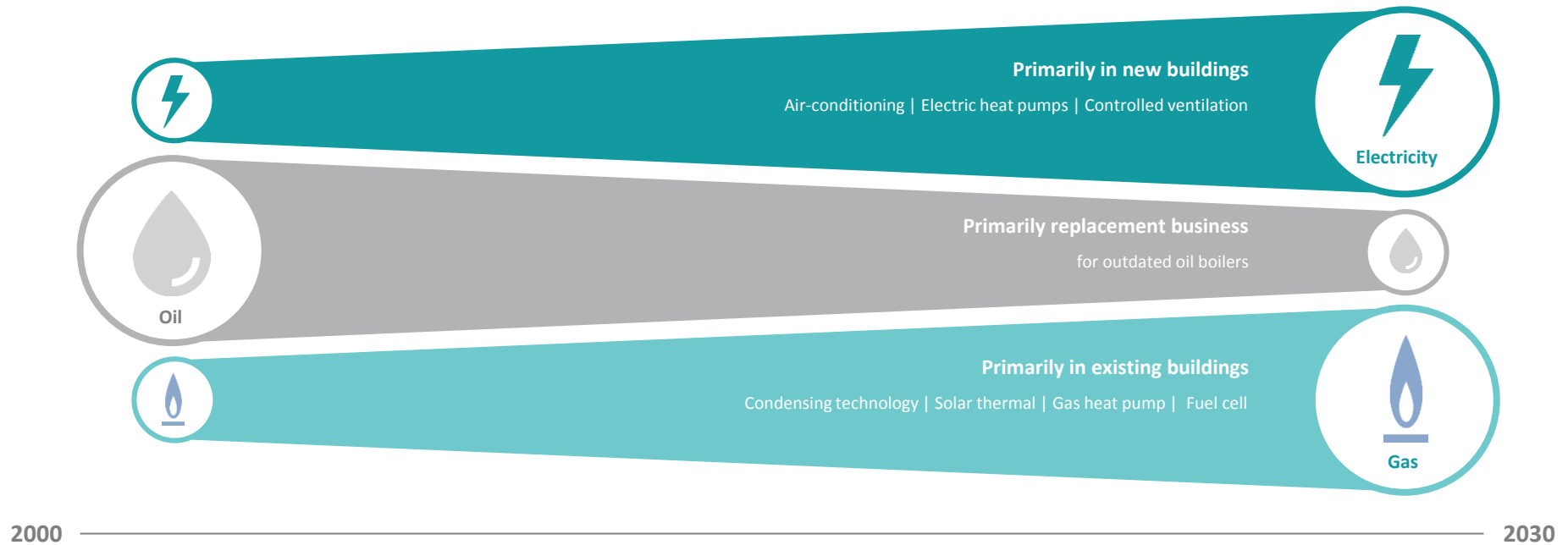
New proposed value is 2.3 which means the maximum power for a direct heating electric appliance is 44%

Commission method: EU PEF (2020) = 1,99 ~ 2.0 proposed by the Commission



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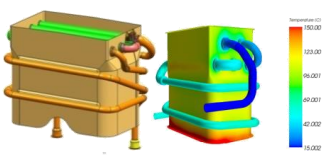
Looking Forward: Trends of Energy Forms and Technologies



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Core Technologies and Technical Trends in water heating

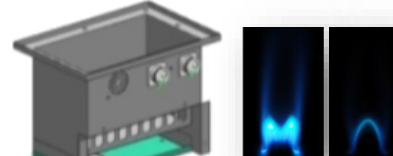
Heat Transfer



**Flue gas Heat Exchanger
Heat Pump Evaporator**

High efficiency - Condensing


Combustion



Gas burners

Low Nox - Premix

Electronic Controllers



**Gas water heater controller
Heat Pump controller
Boiler controller**

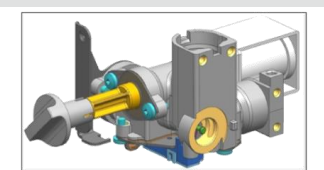
Comfort and Energy management

IoT connectivity and Apps



Remote access, online visualization

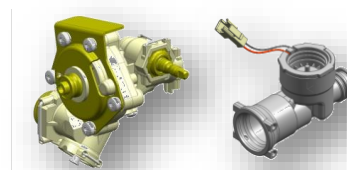
Fluid mechanics



**Mechanical gas valves
Electronic modulation gas valves**

Temperature and emissions control


Hydraulics



**Water valves
Hidrogenerator**

Temperature and water flow stability


Refrigeration



**Heat pump for Domestic
Water & Space Heating modules**

High Efficiency - COP

Big Data Modelling




Optimization and predictive models

Residential Hot Water: We want to take a leading market position

Gas water heaters: milestone in technology and design

- ▶ **Maximum hot water comfort** and optimised energy efficiency
- ▶ Comfortable operation with **remote access**
- ▶ Easy to install
- ▶ Easy to operate and maintain
- ▶ Extreme temperature stability
- ▶ Wi-Fi connectivity
- ▶ High energy efficiency (EF 0.98)
- ▶ High modulation range (3kW-63kW)
- ▶ Low NOx (20 PPM)



Intuitive
touch operation
with colour display

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Future of Gas Technologies in Residential Water Heating



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THANK YOU!