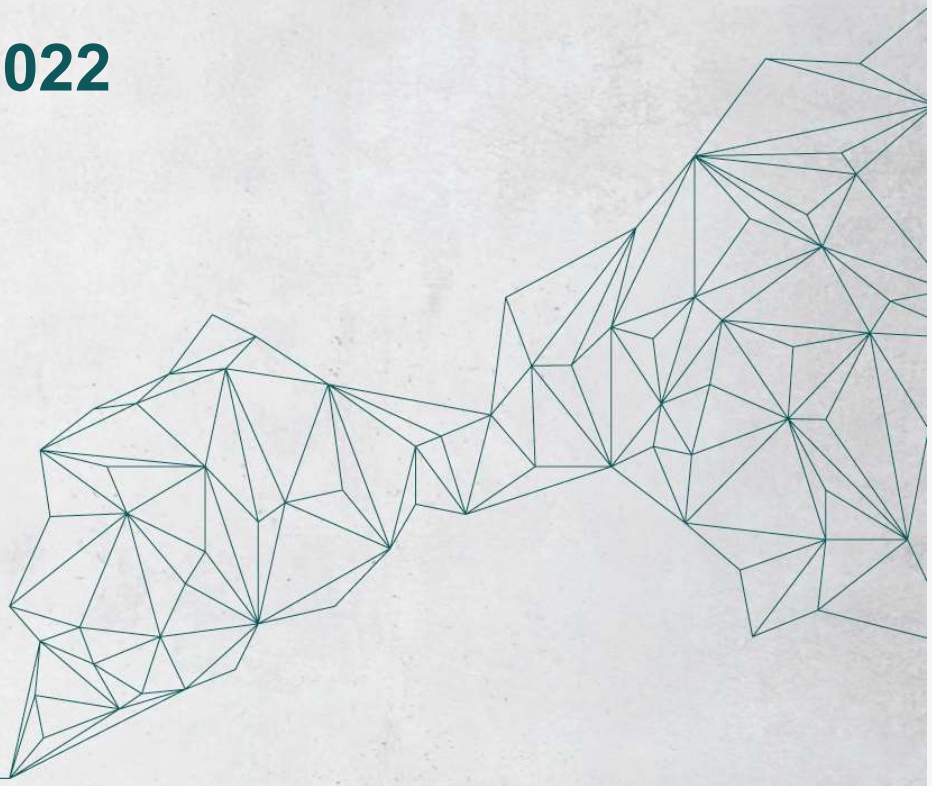
Hall 4A

Chillventa Specialist Forums 2022
Chillventa Fachforen 2022

CONNECTING EXPERTS.




R290
REFRIGERANT HEAT PUMPS
A wave of building renovation

R290 heat pumps – renovation wave

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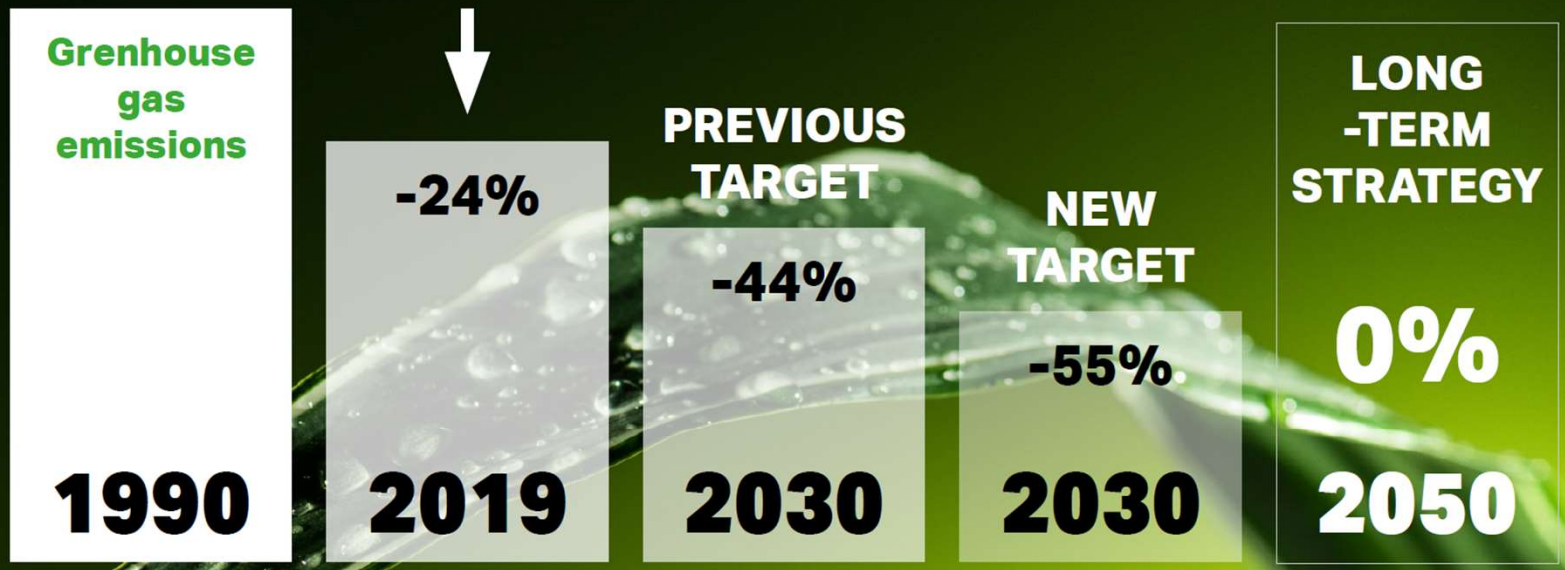
Climate Target Plan 2030 to cut net greenhouse gas emissions in the EU by at least 55% by 2030 compared to 1990.
To achieve the **55%** emission reduction target, by 2030 the EU should reduce buildings' greenhouse gas emissions by **60%**, their final energy consumption by **14%** and energy consumption for heating and cooling by **18%.**



R290 refrigerant heat pumps

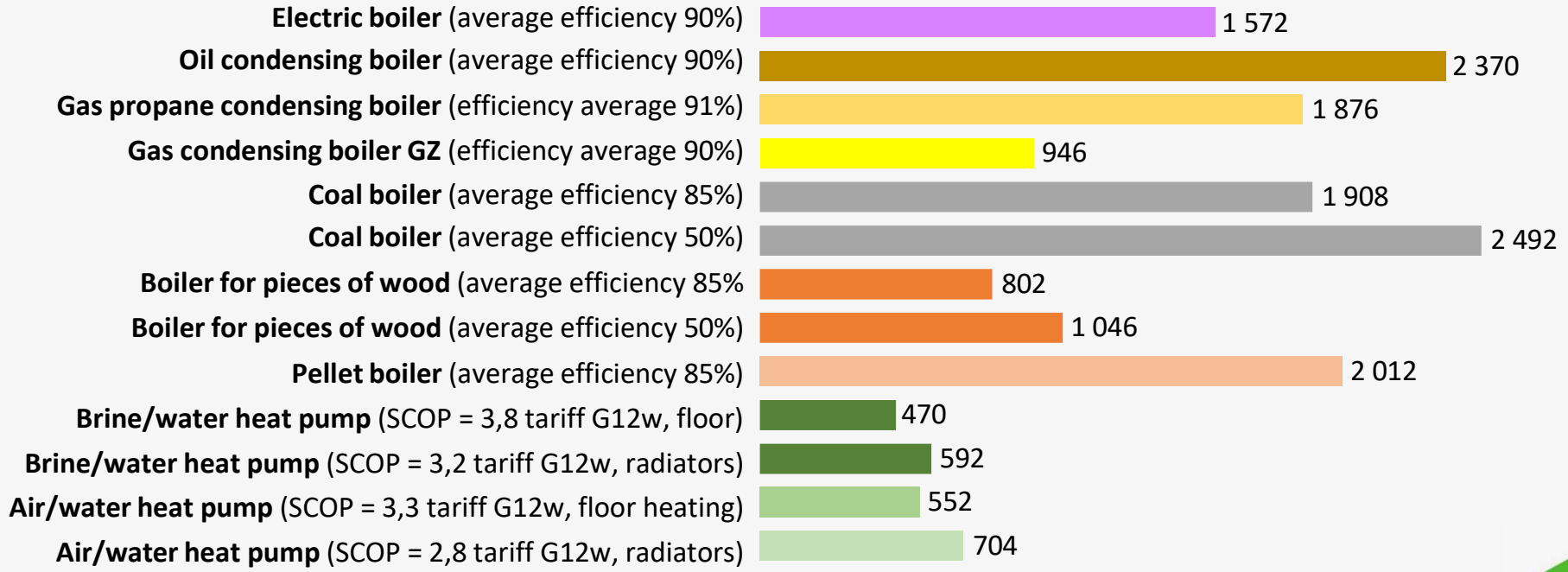
R290 heat pumps

Deep renovation in three steps

- reducing the demand for **usable energy**: wall insulation, replacement of windows, doors, etc.
- reducing the demand for **final energy** demand: insulation of central heating and hot water pipes, regulation f the heating system and heaters and receivers, and replacement of the heat source
- reducing the demand for **primary energy** - using a renewable energy source, e.g. PV, heat pump

R290 heat pumps

The annual cost of heating a building with an area of 150 m²
(in the WT 2017 standard and EU = 80 kWh/m² per year) and domestic hot water preparation (number of people: 4)

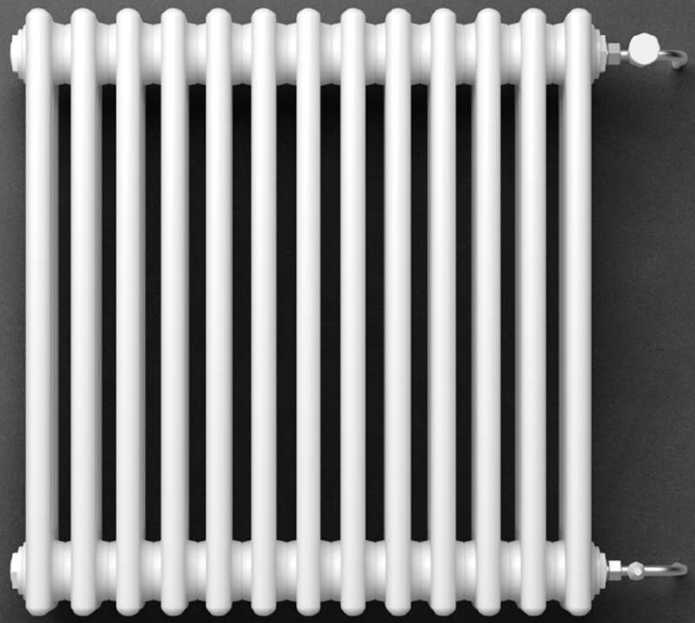


Source: Industry Agreement for Energy Efficiency - POBE

R290 heat pumps

Building characteristics - facilities subject to deep renovation require devices with higher power supply parameters

R290 refrigerant heat pumps



- Existing piping with diameters designed for higher supply temperature and greater difference between supply and return
- Radiators selected for high temperatures.
  Area smaller than for low temperature heating.
- Tends to low emission of CO_2 and using more environmentally friendly energy sources.
- Searching for a heat pump with higher efficiencies at low outdoor temperatures and increased system supply water temperatures.

R290 heat pumps – R290 vs R410A

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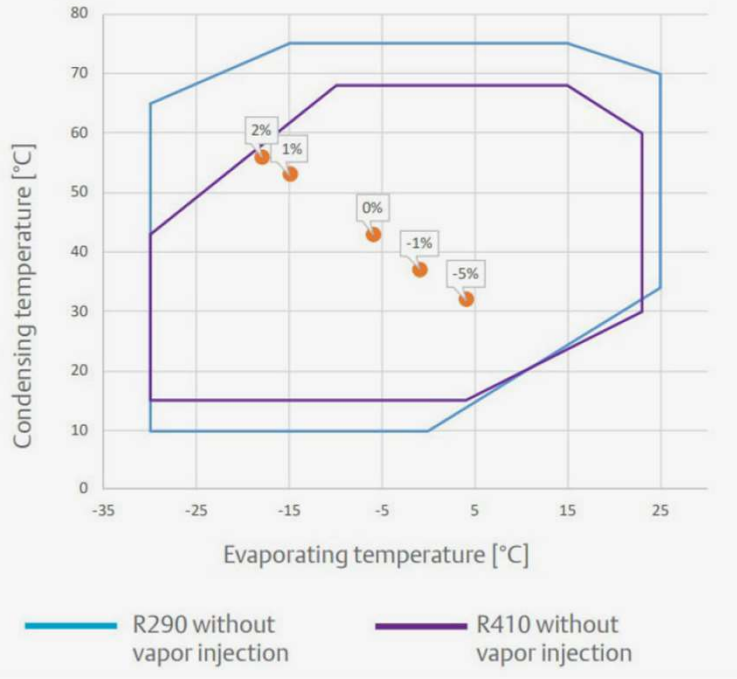
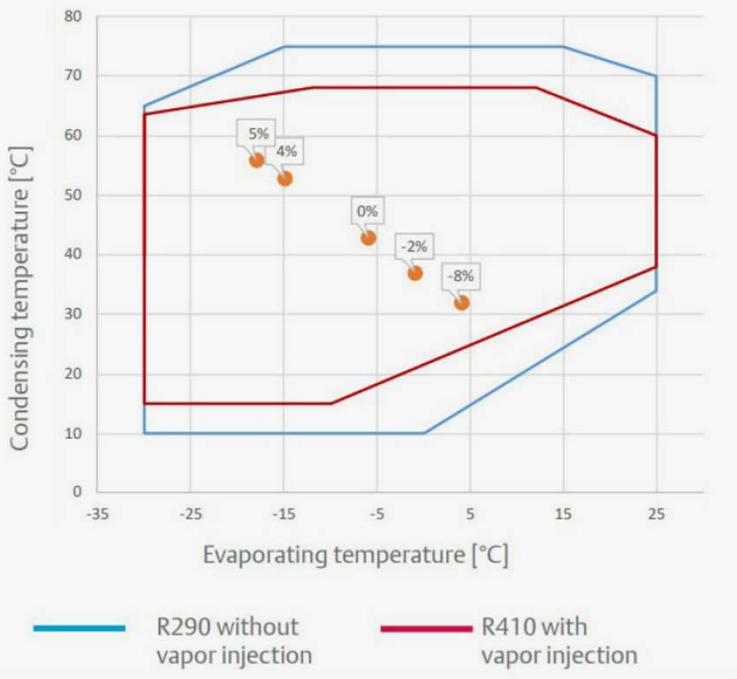
Comparison of R290
and R410 envelope

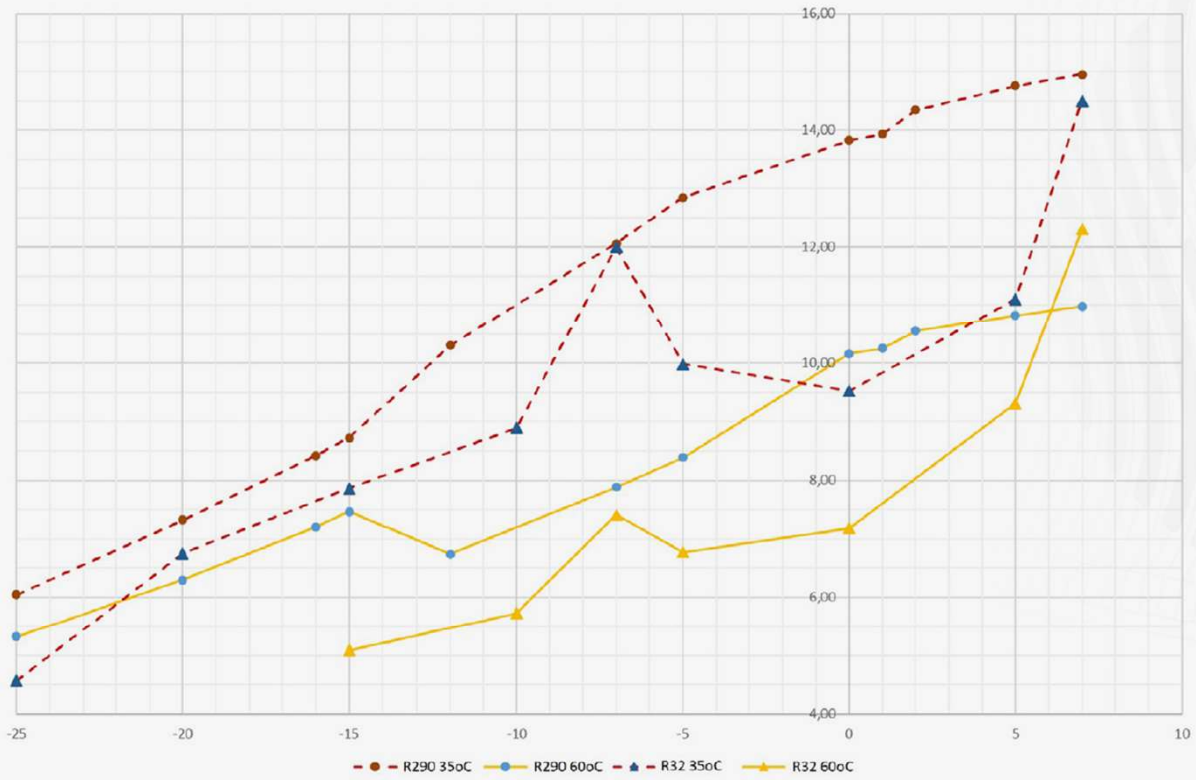


Comparison of R290 envelope (no injection)
and R410A envelope (with injection)



Source: „Copeland Scroll™ for R290 applications"

R290 heat pumps – heating power R290 vs R32

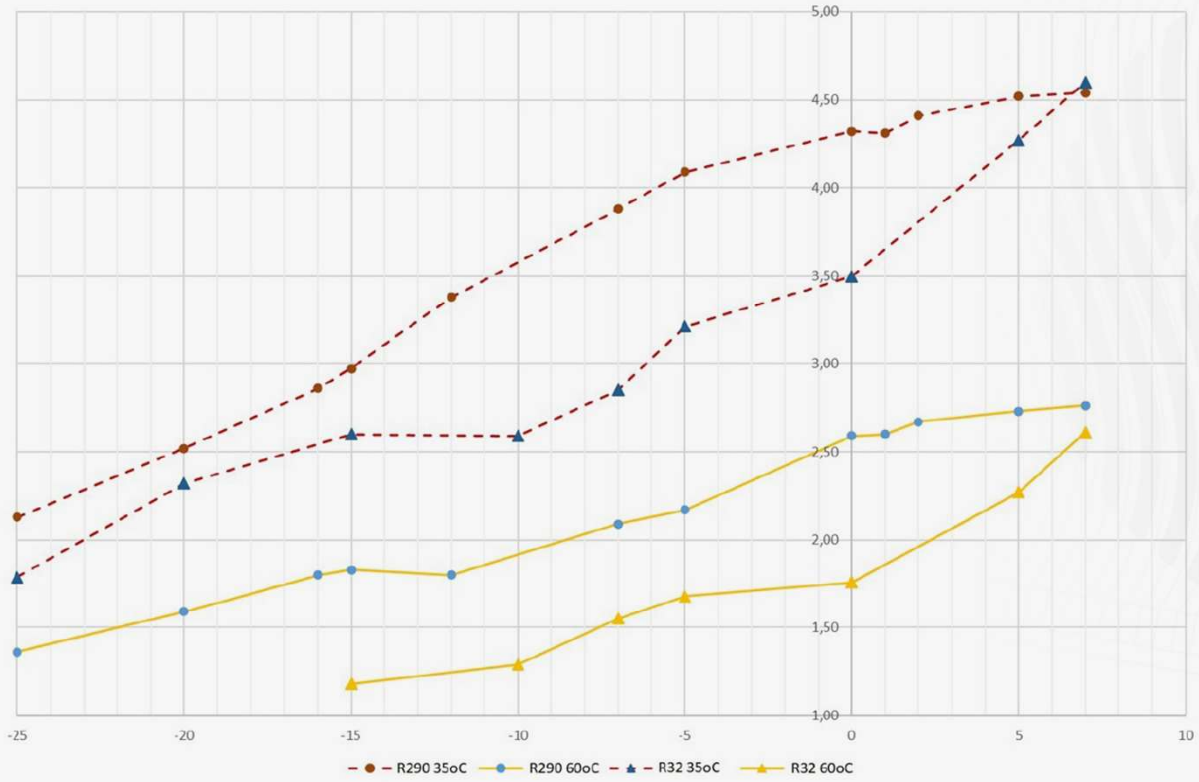


The comparison applies to:

- **15kW** monoblock heat pumps for **R290**
- **14,5kW** monoblock heat pumps for **R32**

Look at defrost time!

R290 heat pumps – COP R290 vs R32



The comparison applies to:

- **15kW** monoblock heat pumps for **R290**
- **14,5kW** monoblock heat pumps for **R32**

Where is the **bivalent point?**

Is an auxiliary **electric heater necessary?**

R290 heat pumps – work safety and requirements

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Refrigerant	Safety class	GWP	Self-igniton temperature C	Maximum surface temperature allowed C
R290	A3	3	470	370
R454C	A2L	148	444	344
R454B	A2L	466	496	396
R32	A2L	675	648	548
R134A	A1	1 430	743	not applicable
R407C	A1	1 774	704	not applicable
R410A	A1	2 088	not defined	not applicable
R404A	A1	3 922	728	not applicable

R290 heat pumps

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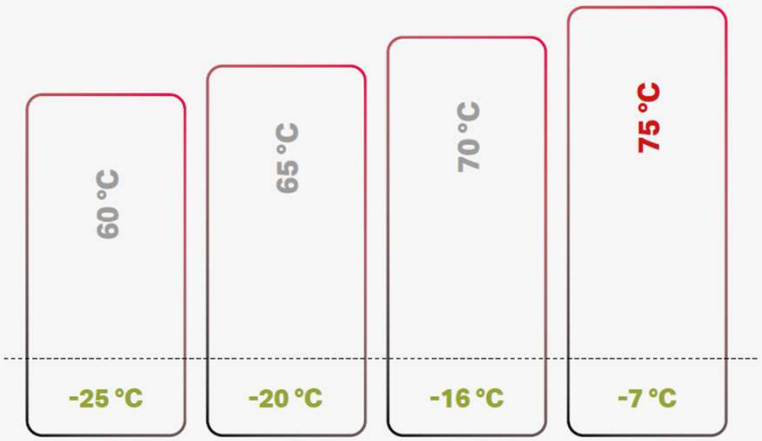
WATER OUTLET TEMPERATURE



OUTSIDE TEMPERATURE

VERY HIGH WATER
OUTLET TEMPERATURE

without auxiliary electric heater

INTELLIGENT
DEFROST

CENTRALIZED
CONTROL

INTUITIVE
CONTROL

INVERTER
TECHNOLOGY

ENERGY-SAVING
CIRCULATION
WATER PUMP

COLOURFUL
TOUCH DISPLAY


WE
CARE
ABOUT
AIR

Hall 4A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