



## The new aroTHERM plus heat pump systems

Product preview

Craig Dolan – Product Manager Renewable Systems



WELCOME  
to our new heat pump:  
**aroTHERM plus**



NEW



aroTHERM plus: Awards innovation ne Mondial du batiment 2019 winner  
aroTHERM Split: redden award 2018 winner (equal casing to aroTHERM plus)

## A perfect team

aroTHERM plus & uniTOWER plus

- High performance SCOP up to 4.9 accord. to EN 14825:2018
- Silent operation
  - Sound power level 54 dB(A)\*\*
  - Sound Safe System
- Fast to install
- Suitable for coastal areas
- Operation down to -25°C
- Flow Temperature up to 75°C



3 kW\*

5 kW\*

7 kW\*

10 kW\*

12 kW\*



## A perfect team

aroTHERM plus & uniTOWER plus

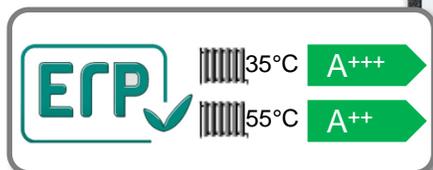


- Easy expansion and component integration
- Compact installation with integrated DHW solution
- More than 200 litres hot water a day (40°C)
- Increase of hot water tapping up to +25% possible\*
- DHW COP 2,6 (Load profile XL)
- Simple transport and installation with Split Mounting Concept
- Heating expansion vessel size 15 L inside (one of the biggest in the market) for houses up to 160 m<sup>2</sup>



## Meets high domestic hot water demands

aroTHERM plus & MEH 97



- Flexible adaptation on all kind of applications e.g.:
  - coverage of higher DHW demand
  - integration of solar thermal
  - integration of existing DHW cylinders
- Heating expansion vessel size 10 litre inside
- High modulating back up heater up to 9kW
- Integrated 3-way valve
- Connection of 230V and 400V possible
- Installation wizard



3 kW\*

5 kW\*

7 kW\*

10 kW\*

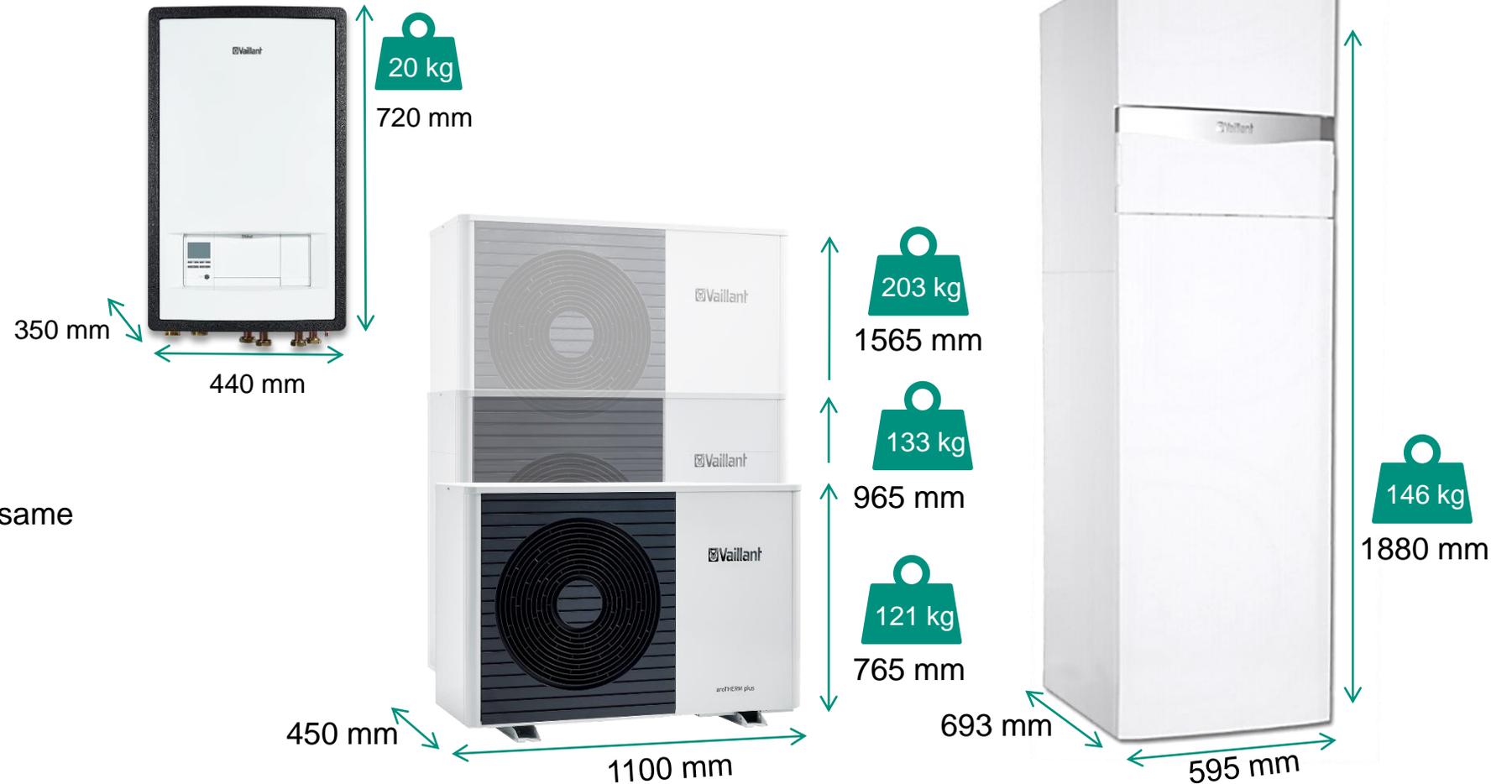
12 kW\*



## Product dimensions

Different outputs, same footprint

- The footprint of the outdoor unit remains the same, whatever the type of house
- Option to choose a more powerful unit without having an impact on construction and installation planning
- Connections are always the same position, to standardize the installation



# Optional accessories to be optional integrated

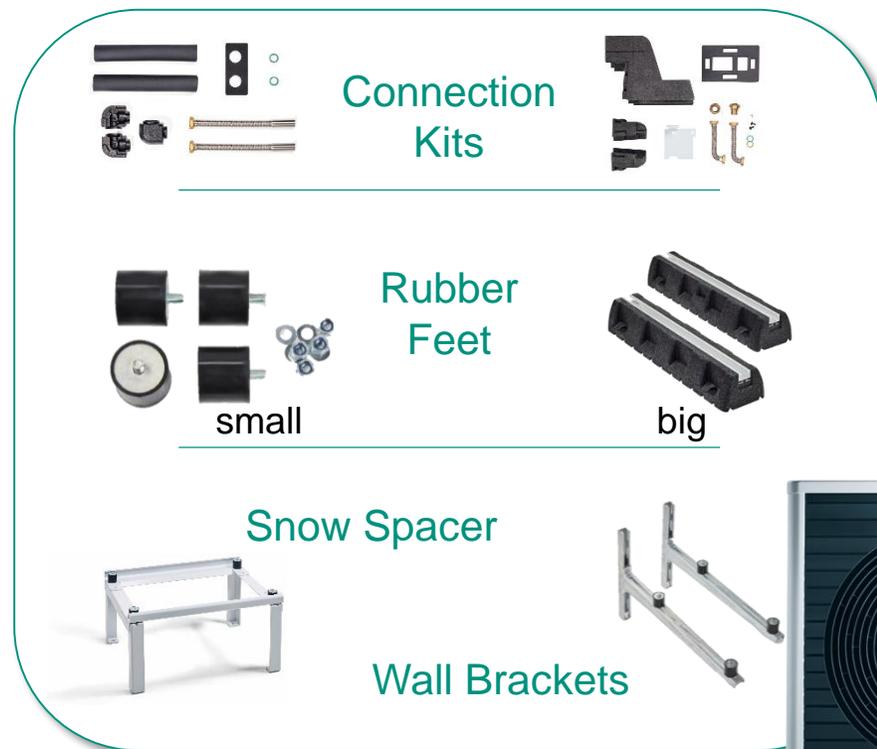
For quick and easy installation

**Connection Kits**

**Rubber Feet**  
small      big

**Snow Spacer**

**Wall Brackets**



**DHW expansion vessel**



**Anti legionella and circulation pumps**



**Buffer tank or 1-2 circuits kits**



**Current anode**

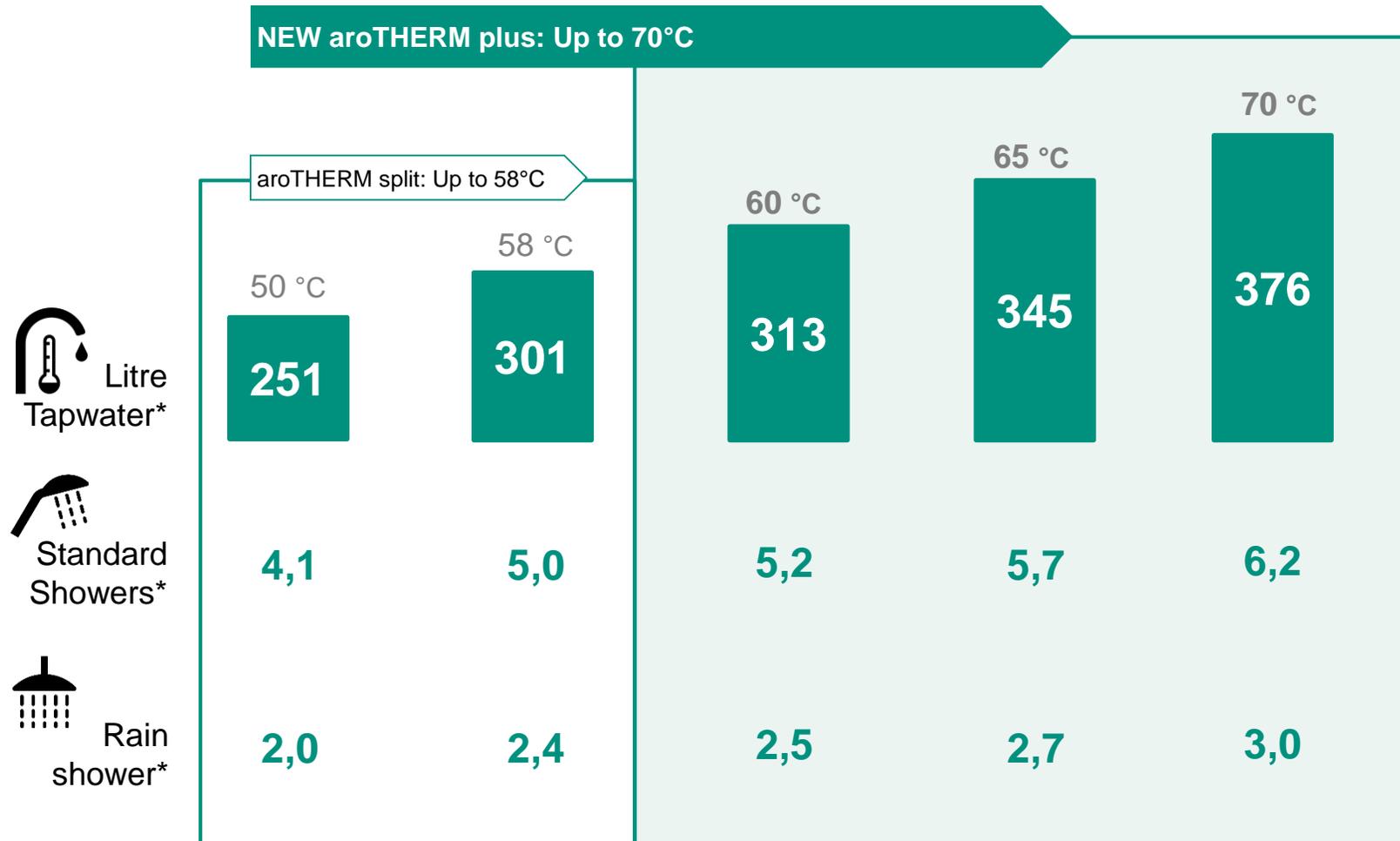


**De-coupling module**



# Meets highest domestic hot water demands

Serve rain showers also with our compact uniTOWER plus system



Tapping volume increase of **25%** compared to aroTHERM split



## 2. Product comparisons

# Improvements of aroTHERM plus

Current vs. new aroTHERM with monobloc technology

## Performance

Heating capacity  
(A-7/W35)



4,9 to 11,8 kW

3,0 to 12,0 kW

COP (A7/W35)

4,7  
EN 14511:2013

5,4  
EN 14511:2018

Max Flow Temp.

62°C

75°C

## Sound

ErP Sound Power

58 dB(A)

55 dB(A)

Silent mode

55 dB(A)

48 dB(A)



# Improvements of aroTHERM plus

Current vs. new aroTHERM with monobloc technology

## Ecology

Refrigerant/  
GWP

R410a  
GWP = 2088

R290  
GWP = 3

Refrigerant charge

1,8 to 4,4 kg

0,6 to 1,3 kg

CO2 Equivalent

3758 kg

1,8 kg

## Installation

Placement restrictions

none

Distance to cellar  
windows required



### 3. Natural refrigerant

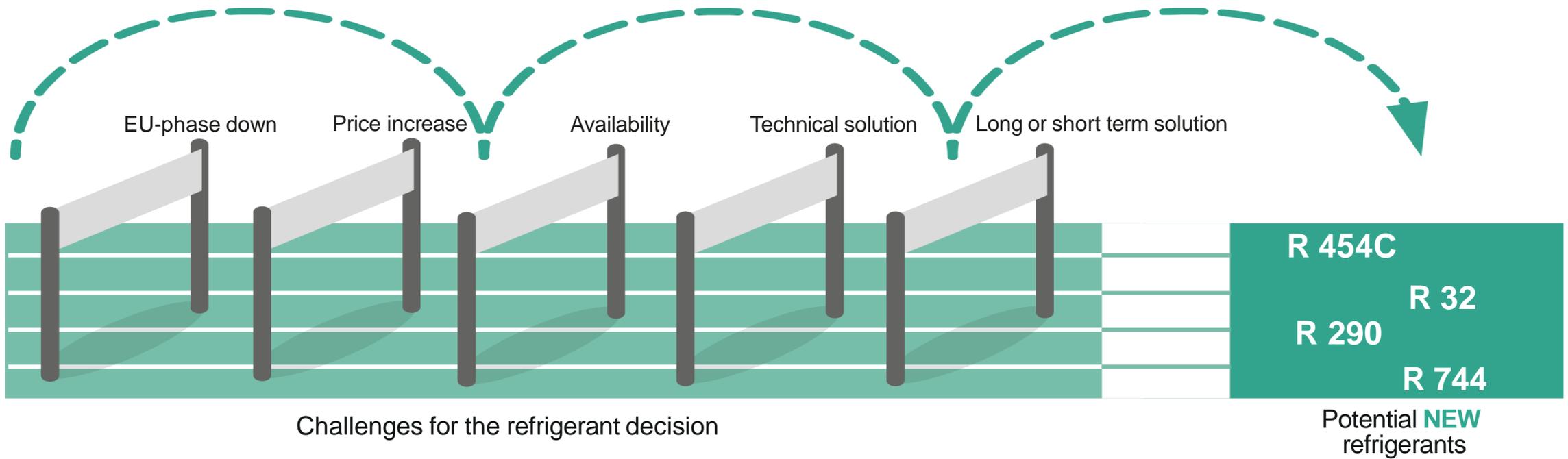
## Always moving forward

Our promise

- Vaillant will upgrade its heat pump portfolio to **natural refrigerant**; for you and our environment
- The aroTHERM plus system is the **1st heat pump** to use natural refrigerant
- The new **aroTHERM** system is **super quiet**, can be **installed in just one day** and provides **outstanding levels of comfort**
- Drawing on **over 140 years of experience** in the manufacture of heating and hot water products we will deliver this change with you

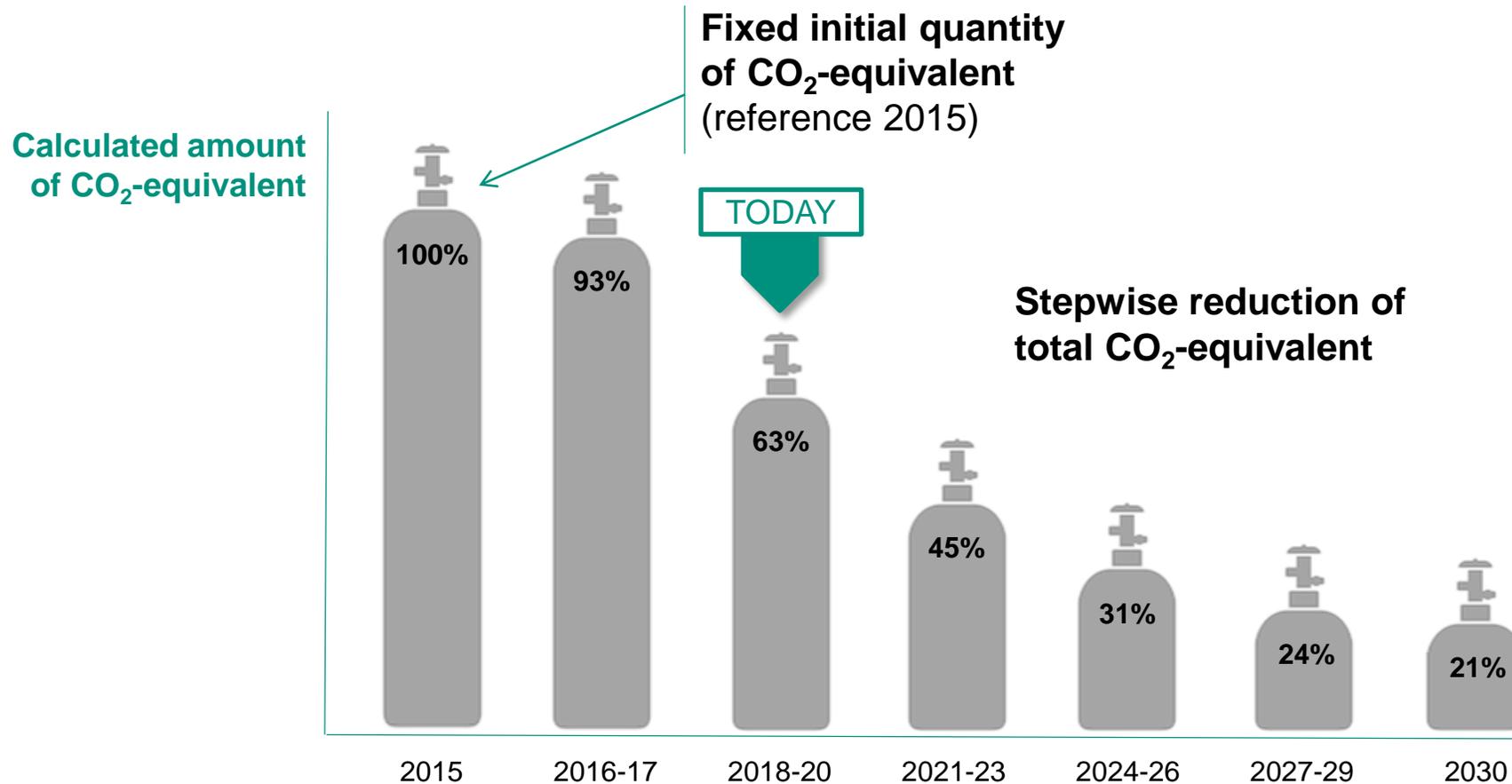


# Why we need to change the refrigerant?



# F-Gas regulation “phase down”

European-wide reduction of fluorine based refrigerants

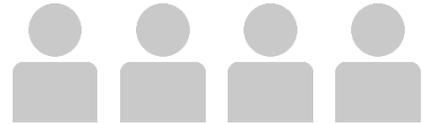


In the long-term, only low GWP refrigerants will remain in the market!

# One ton of CO<sub>2</sub> ...

A little bit of context

... is emitted by



4 adults breathing  
in one year

or



400 litres petrol

or

or



6 hours flight per  
passenger

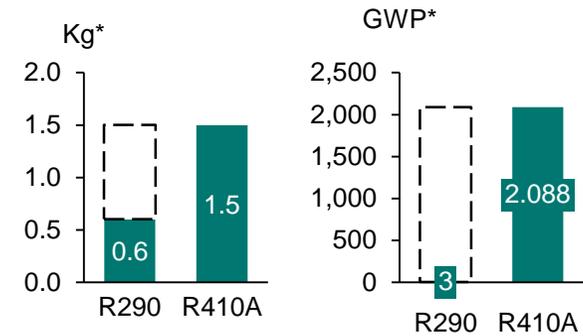
EMITTING

... can be absorbed by

ABSORBING



## Why we chose R290 instead of R410a

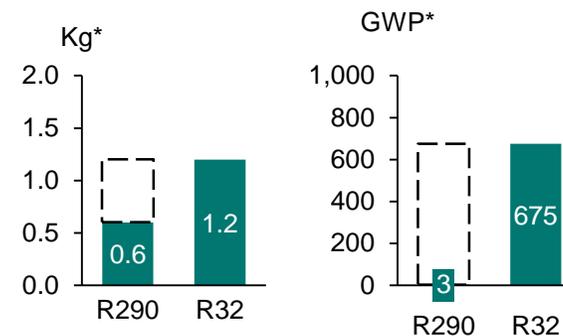


### What's in for you!

Refrigerant specifics			-
Installation area	Min. distance to doors, windows and light shafts	No restrictions for outdoor units	<i>Min. distance needs to be considered</i>
Special Tools	Spark free tools needed	No extra tools needed	
Availability (Production & Service)	High	Low to middle (depending on market development)	Our Product will have a <b>stable</b> refrigerant <b>price</b> level and <b>availability</b> for servicing
GWP	3	2088	Our Product is <b>future proof</b>
Refrigerant charge*	0,6 kg	1,5 kg	Our Product reduces the <b>refrigerant charge by - 60%</b>
Carbon Footprint	0.83 kg/CO <sub>2</sub> eq	11.85 kg/CO <sub>2</sub> eq	Our System runs with a <b>natural refrigerant</b>
Life time impact*	14,402 kg/CO <sub>2</sub>	17,141 kg/CO <sub>2</sub>	Our System <b>reduces</b> the <b>CO2 emission</b> by 2.8 tones. = <b>106 lights switched to LEDs</b>



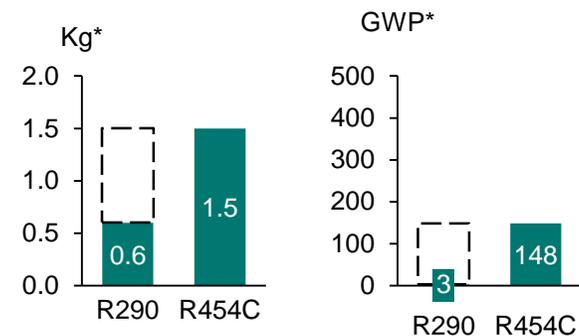
## Why we chose R290 instead of R32



### What's in for you!

Refrigerant specifics			-
Installation area	Min. distance to doors, windows and light shafts	No restrictions for outdoor units	<i>Min. distance needs to be considered</i>
Special Tools	Spark free tools needed	Spark free tools needed	<i>Both systems require the same equipment</i>
Availability (Production & Service)	High	Middle to high (depending on market development)	<i>Both systems will have a high availability in the near future. Our product is also a <b>long term solution</b></i>
GWP	3	675	Our Product is a long term solution and is <b>future proof</b>
Refrigerant charge*	0,6 kg	1,2 kg	Our Product reduces the <b>refrigerant charge by - 50%</b>
Carbon Footprint	0.83 kg/CO <sub>2</sub> eq	9.28 kg/CO <sub>2</sub> eq	Our System runs with a <b>natural refrigerant</b>
Life time impact*	14,403 kg/CO <sub>2</sub>	14,423 kg/CO <sub>2</sub>	Our System <b>reduces the CO<sub>2</sub> emission</b> by 38 kg = <b>1,4 lights switched to LEDs</b>

## Why we chose R290 instead of R454c



### What's in for you!

Refrigerant specifics		Temperature Glid of 6K	-
Installation area	Min. distance to doors, windows and light shafts	No restrictions for outdoor units	<i>Min. distance needs to be considered</i>
Special Tools	Spark free tools needed	Spark free tools needed	<i>Both systems require the same equipment</i>
Availability (Production & Service)	High	High	<i>Both systems are long term solutions</i>
GWP	3	148	<i>Both systems are long term solutions</i>
Refrigerant charge*	0,6 kg	1,5 kg	Our Product reduces the <b>refrigerant charge by - 60%</b>
Carbon Footprint	0.83 kg/CO <sub>2</sub> eq	8.62 kg/CO <sub>2</sub> eq	Our System runs with a <b>natural refrigerant</b>
Life time impact*	14,403 kg/CO <sub>2</sub>	14,594 kg/CO <sub>2</sub>	Our System <b>reduces the CO2 emission</b> by 171 kg = <b>6,5 lights switched to LEDs</b>

## 4. Product benefits

## Installation within one day

Grow your heat pump business by maximising your technician manpower planning

Installation within

**1 DAY**

with 2 engineers

- Two people for transport, one technician for installation
- No refrigerant certification for installation needed
- Fast installation with comprehensive accessories
- Tidy installation - happy customers

aroTHERM plus



uniTOWER plus



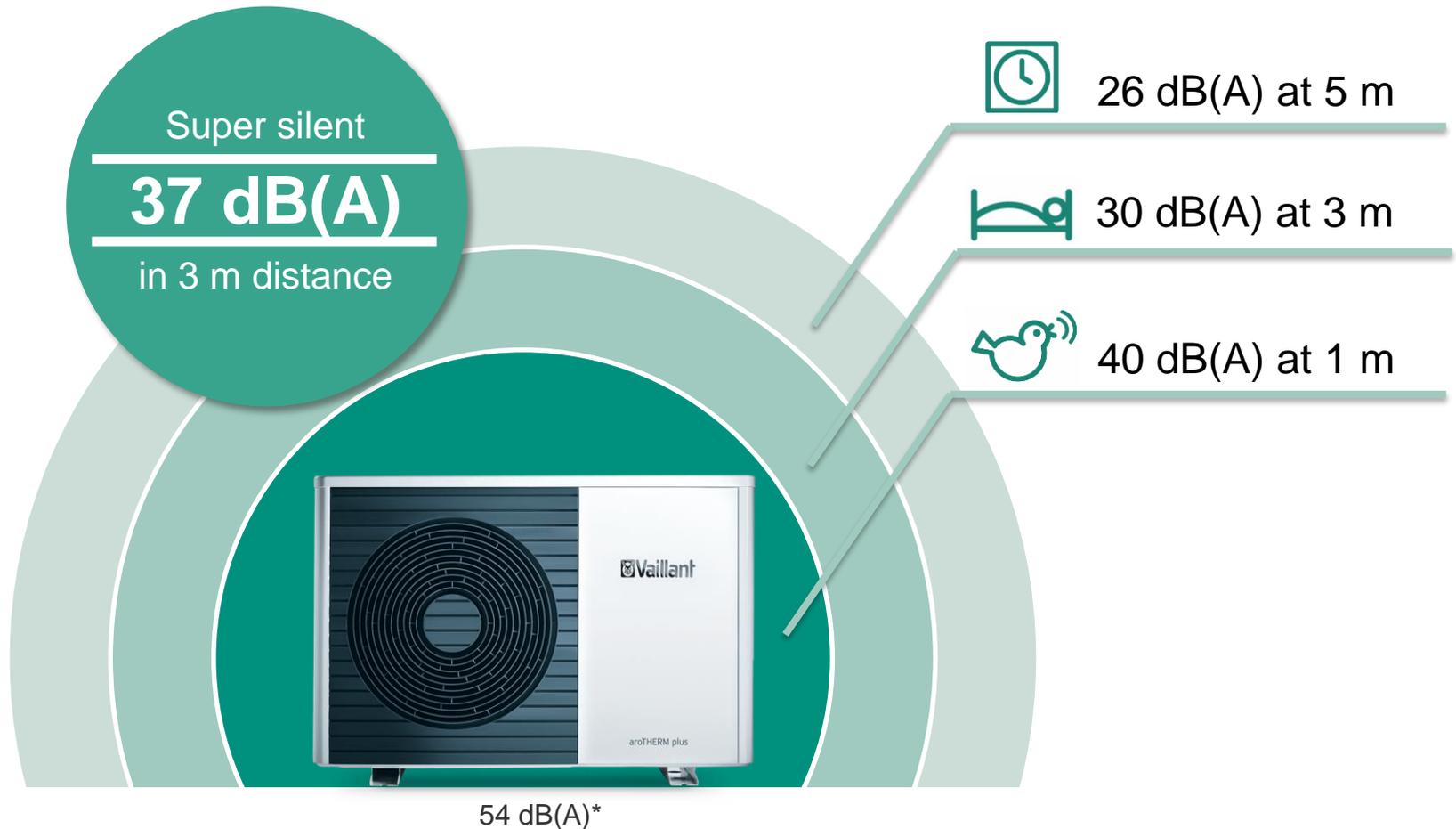
sensoCOMFORT



## Super silent

Install aroTHERM plus even in dense terraced houses close to the house of the neighbours

- One of our quietest outdoor heat pumps
- Total flexibility for locating the heat pump outside
- New air flow conception and SoundSafeSystem to minimize sound emissions



# Energy savings more than 10 %\* possible in new-build and modernization<sup>1</sup>

Super efficient system with COP of up to 5,4



## The Golden Rule

Reducing energy consumption and lowering running costs

**The golden rule for heating systems:**  
The lower the heating flow temperature,  
the more efficient the **heating system!**

### **In consequence:**

Reducing the flow temperature always means an efficiency improvement and with that a reduction of energy consumption and costs.



Modernization



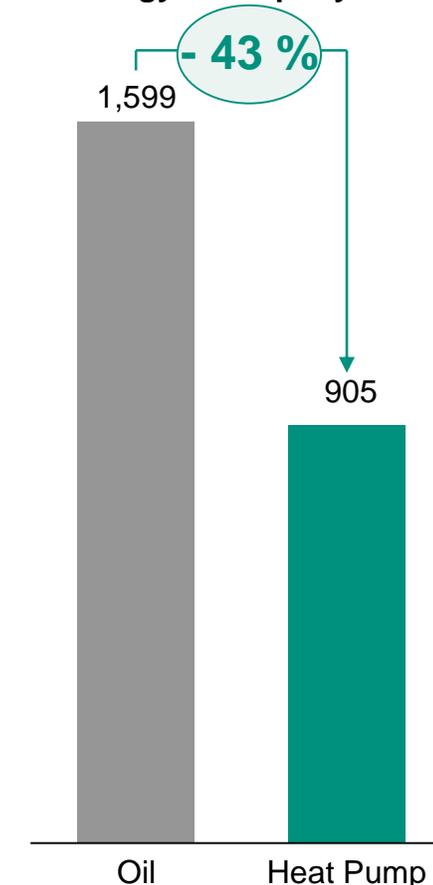
Radiators

# Achieve energy cost savings of 43%\*

In modernization projects compared to oil heater replacements

Heating		Oil heating	aroTHERM plus VWL 125/6
Heating demand building DIN EN 12831	kW	12	12
Running hours per year MIS 3005	h/a	1.641	1.641
Heat generator & distribution efficiency	%	0,893	0,95
SCOP	-	0.92	3.66
Energy consumption heat generator	kWh/a	23,969	5,664
Energy price heat generator	p/kWh	6	14
<b>Energy cost heating</b>	<b>£/a</b>	<b>1,438</b>	<b>793</b>
<b>DHW</b>			
Person	P	4	4
DHW demand per person and day	l/P*d	45	45
Heat generator & distribution efficiency	%	0.86	0.95
SCOP*	-	1	3.00
Energy consumption DHW	kWh/a	2,681	804
<b>Energy cost DHW</b>	<b>£/a</b>	<b>161</b>	<b>113</b>
<b>Energy cost total**</b>	<b>£/a</b>	<b>1,599</b>	<b>905</b>

Energy costs per year



Vaillant

\* The actual achievable or achieved energy savings depend on a number of factors which may vary, in particular the locally available electricity prices, the installed predecessor unit, the heating configuration, the usage, the installation site and the average outdoor temperature at the installation site of the new aroTHERM plus.

\*\* Energy cost and SCOP calculation based MIS 3005 midlands. Fossil heat generator efficiency of 92%. Heat pump SCOP according to MCS SCoP (aroTHERM plus VWL 125/6, flow temp. 55°C, Heating outdoor temp. start 15°C, 10 K Delta T, Monovalent, 18% DHW). Heat distribution efficiency 95%.



Modernization



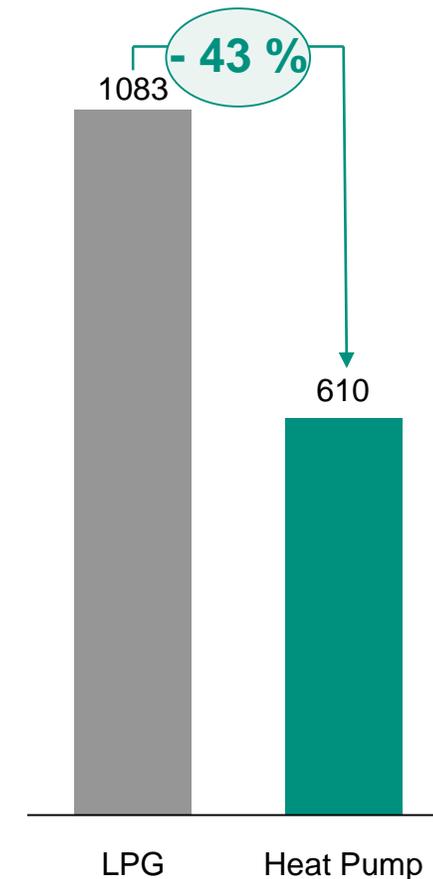
Radiators

## Achieve energy cost savings of 43 %\*

In modernization projects compared to LPG heater replacements

Heating		LPG heating	aroTHERM plus VWL 75/6
Heating demand building DIN EN 12831	kW	7	7
Running hours per year (MIS 3005)	h/a	1.641	1.641
Heat generator & distribution efficiency	%	0,893	0,95
SCOP	-	0.92	3.4
Energy consumption heat generator	kWh/a	13,982	3,556
Energy price heat generator	p/kWh	6.5	14
<b>Energy cost heating</b>	<b>£/a</b>	<b>909</b>	<b>498</b>
<b>DHW</b>			
Person	P	4	4
DHW demand per person and day	l/P*d	45	45
Heat generator & distribution efficiency	%	0,86	0,95
SCOP*	-	1	3
Energy consumption DHW	kWh/a	2,681	804
<b>Energy cost DHW</b>	<b>£/a</b>	<b>174</b>	<b>113</b>
<b>Energy cost total**</b>	<b>£/a</b>	<b>1083</b>	<b>610</b>

Energy costs per year



\* The actual achievable or achieved energy savings depend on a number of factors which may vary, in particular the locally available electricity prices, the installed predecessor unit, the heating configuration, the usage, the installation site and the average outdoor temperature at the installation site of the new aroTHERM plus.

\*\* Energy cost and SCOP calculation based on MIS 3005 midlands. Fossil heat generator efficiency of 92%. Heat pump SCOPs according to MCS 3005 (VWL 75/6, flow temp. 55°C, Heating outdoor temp. start 15°C, 10 K Delta T, Monovalent, 18% DHW). Heat distribution efficiency 95%.

# Achieve energy cost savings of 13 %\*

In modernization projects compared to Gas heater replacements



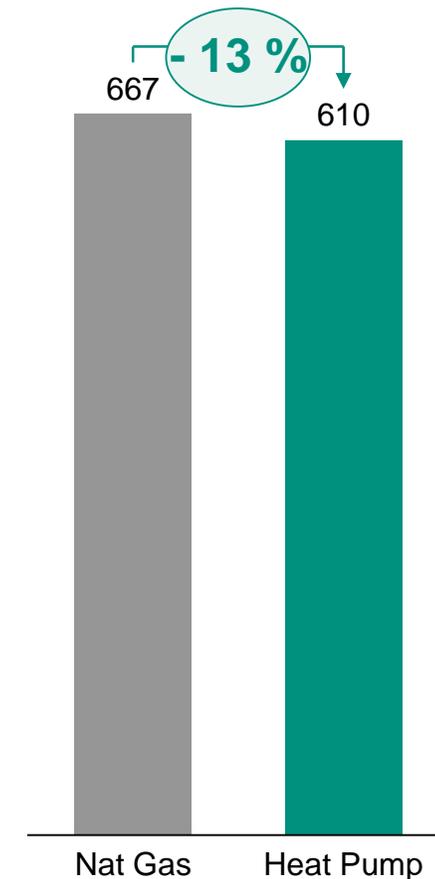
Modernization



Radiators

Heating		Nat Gas heating	aroTHERM plus VWL 75/6
Heating demand building DIN EN 12831	kW	7	7
Running hours per year (MIS 3005)	h/a	1.641	1.641
Heat generator & distribution efficiency	%	0,893	0,95
SCOP	-	0.92	3.4
Energy consumption heat generator	kWh/a	13,982	3,556
Energy price heat generator	p/kWh	4	14
<b>Energy cost heating</b>	<b>£/a</b>	<b>559</b>	<b>498</b>
<b>DHW</b>			
Person	P	4	4
DHW demand per person and day	l/P*d	45	45
Heat generator & distribution efficiency	%	0,86	0,95
SCOP*	-	1	3
Energy consumption DHW	kWh/a	2,681	804
<b>Energy cost DHW</b>	<b>£/a</b>	<b>107</b>	<b>113</b>
<b>Energy cost total**</b>	<b>£/a</b>	<b>667</b>	<b>610</b>

Energy costs per year



\* The actual achievable or achieved energy savings depend on a number of factors which may vary, in particular the locally available electricity prices, the installed predecessor unit, the heating configuration, the usage, the installation site and the average outdoor temperature at the installation site of the new aroTHERM plus.

\*\* Energy cost and SCOP calculation based on MIS 3005 midlands. Fossil heat generator efficiency of 92%. Heat pump SCOPs according to MCS 3005 (VWL 75/6, flow temp. 55°C, Heating outdoor temp. start 15°C, 10 K Delta T, Monovalent, 18% DHW). Heat distribution efficiency 95%.

## The Golden Rule

Reducing energy consumption and lowering running costs

**The golden rule for heating systems:**  
The lower the heating flow temperature,  
the more efficient the **heating system!**

### **In consequence:**

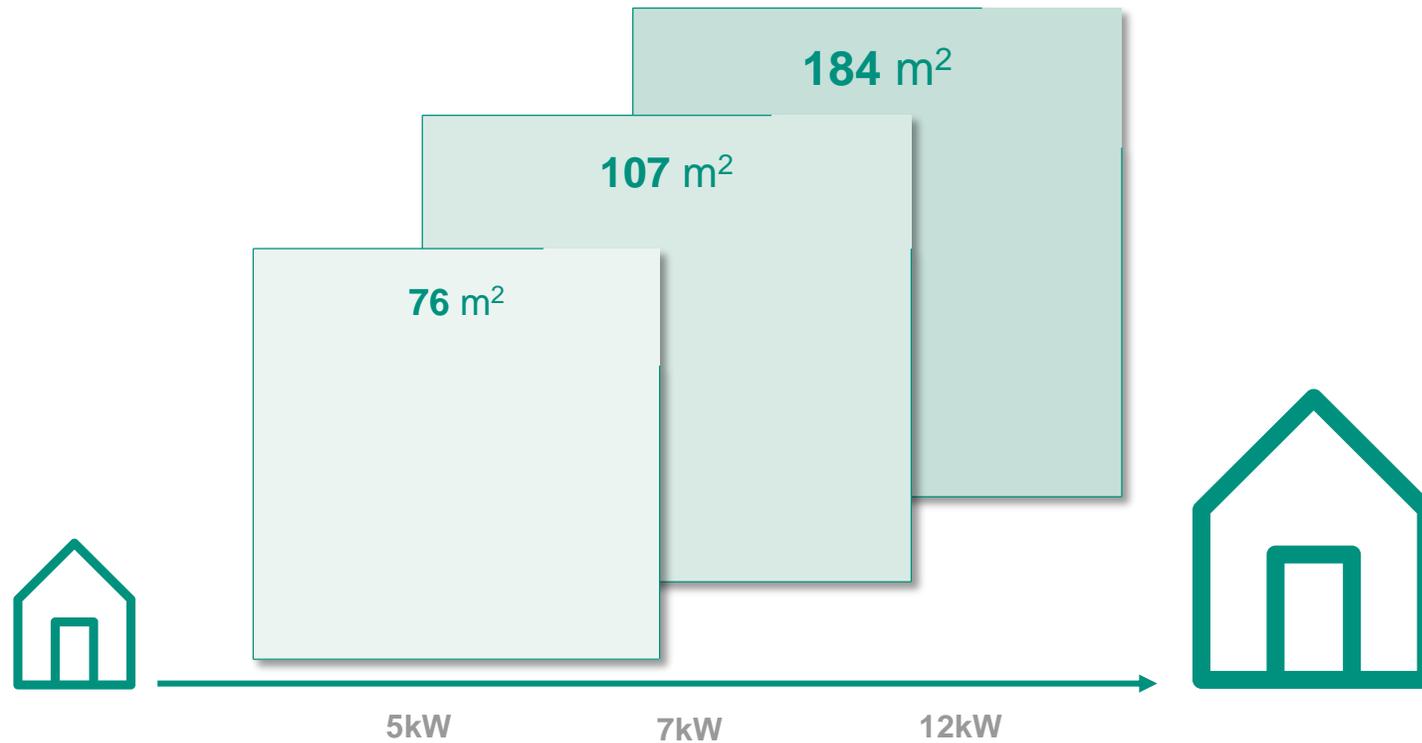
Reducing the flow temperature always means an efficiency improvement and with that a reduction of energy consumption and costs.



Radiators

## Homes built between 1970-1984 assumed peak heating requirement of 65W/m<sup>2</sup>

Home with new heating system to comply with new Part L building regulations



With  
flow temperature  
of 55°C:  
**RADIATOR  
READY**



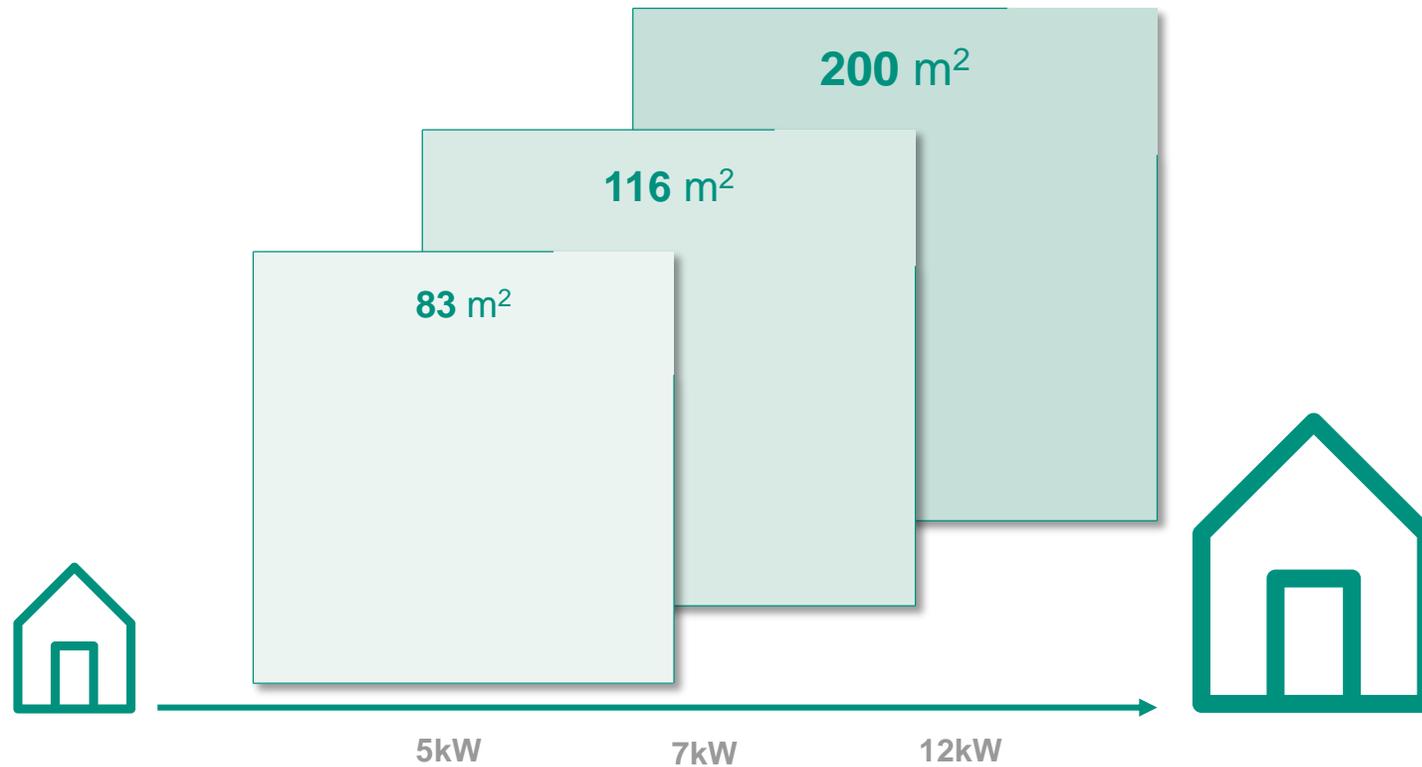
\* This is a assumed Peak heat loss, actually heat loss needs to be calculated and will vary regional and due to the type of build construction, assumption that insulation and double glazing has been fitted



Radiators

## Homes built between 1985-1995 assumed peak heating requirement of 60W/m<sup>2</sup>

Home with new heating system to comply with new Part L building regulations



With  
flow temperature  
of 55°C:  
**RADIATOR  
READY**



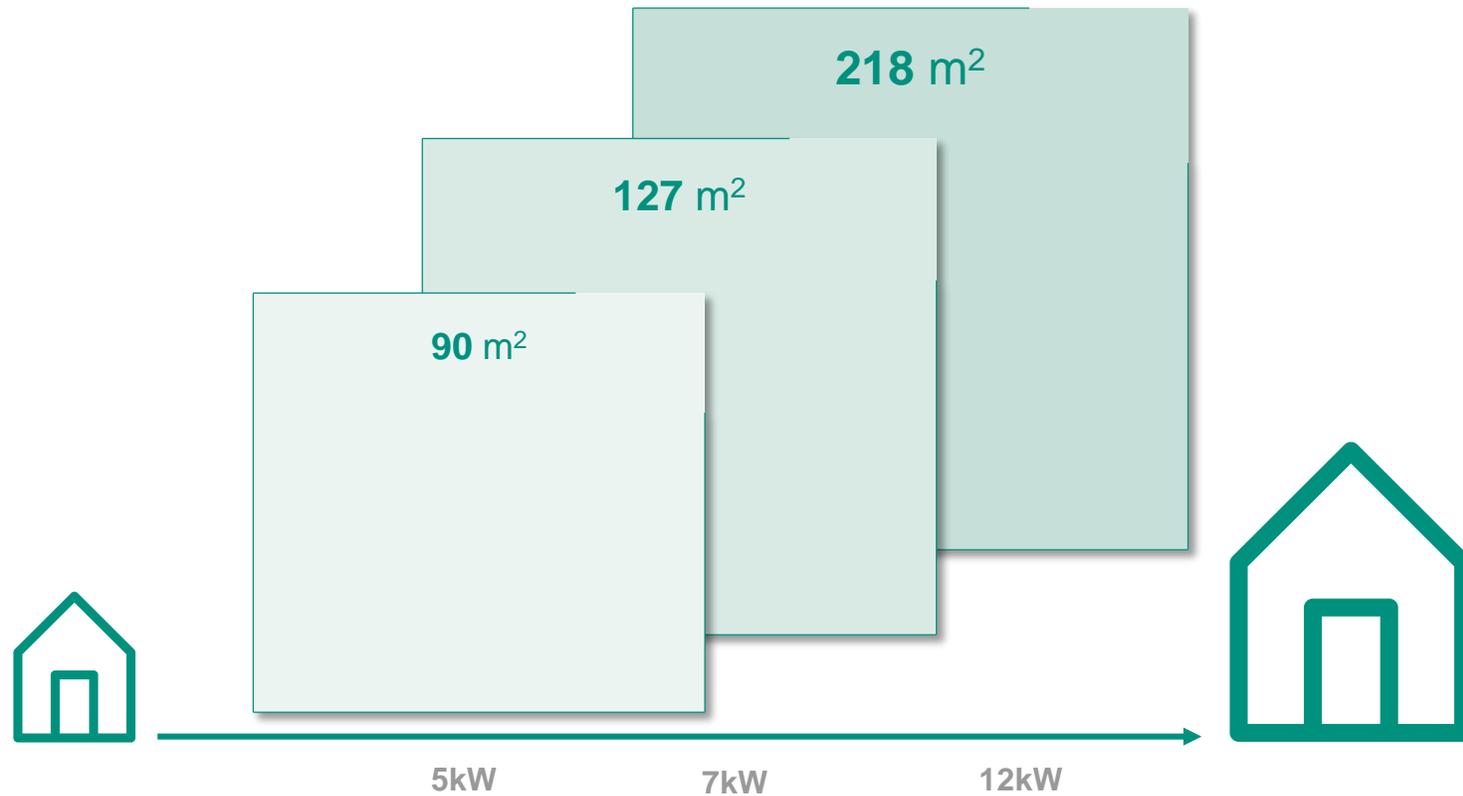
\* This is a assumed Peak heat loss, actually heat loss needs to be calculated and will vary regional and due to the type of build construction, assumption that insulation and double glazing has been fitted



Radiators

# Homes built between 1996-2005 assumed peak heating requirement of 55W/m<sup>2</sup>

Home with new heating system to comply with new Part L building regulations



With  
flow temperature  
of 55°C:

**RADIATOR  
READY**



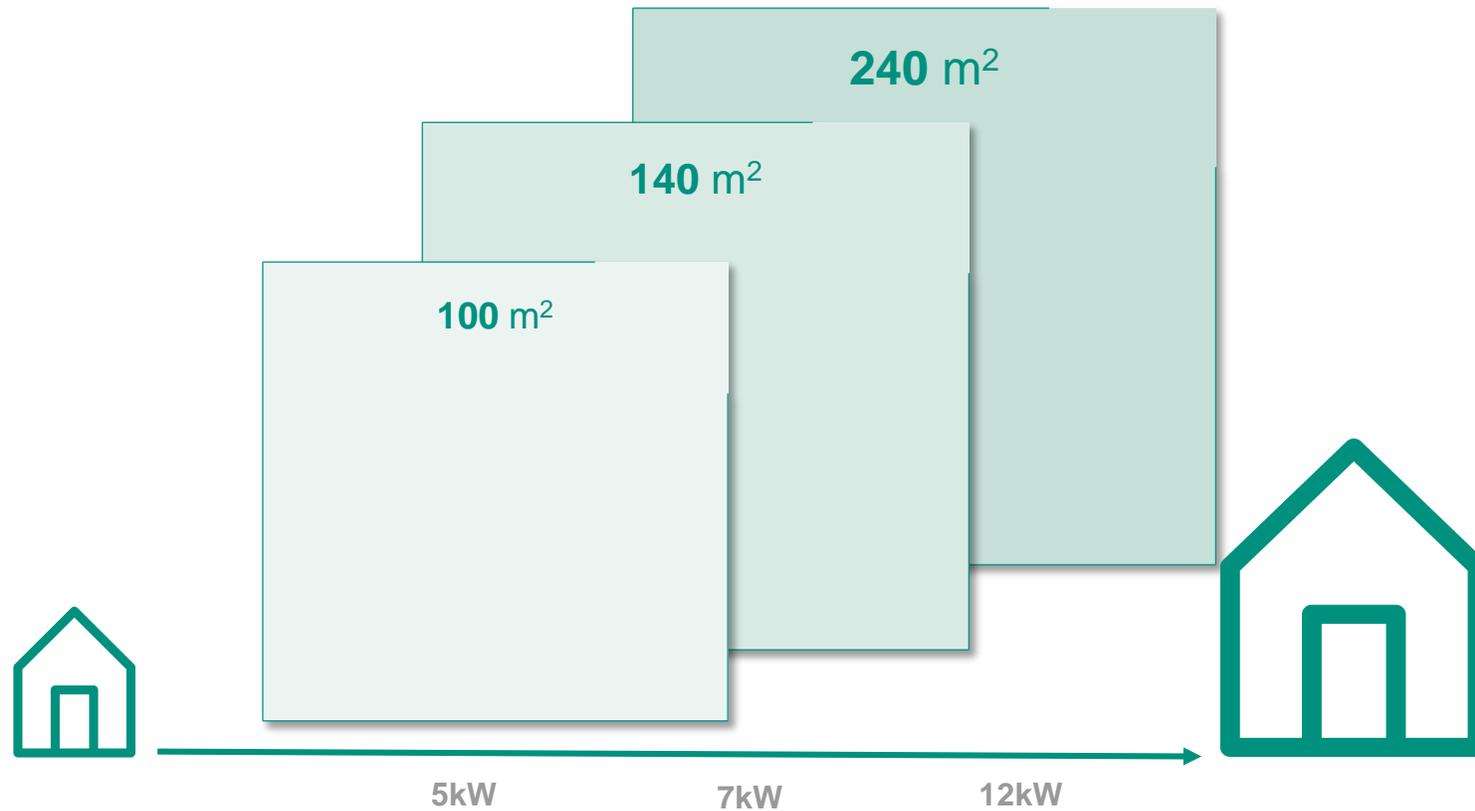
\* This is a assumed Peak heat loss, actually heat loss needs to be calculated and will vary regional and due to the type of build construction, assumption that insulation and double glazing has been fitted



Radiators

# Homes built between 2006-2010 assumed peak heating requirement of 50W/m<sup>2</sup>

Home with new heating system to comply with new Part L building regulations



With flow temperature of 55°C:  
**RADIATOR READY**



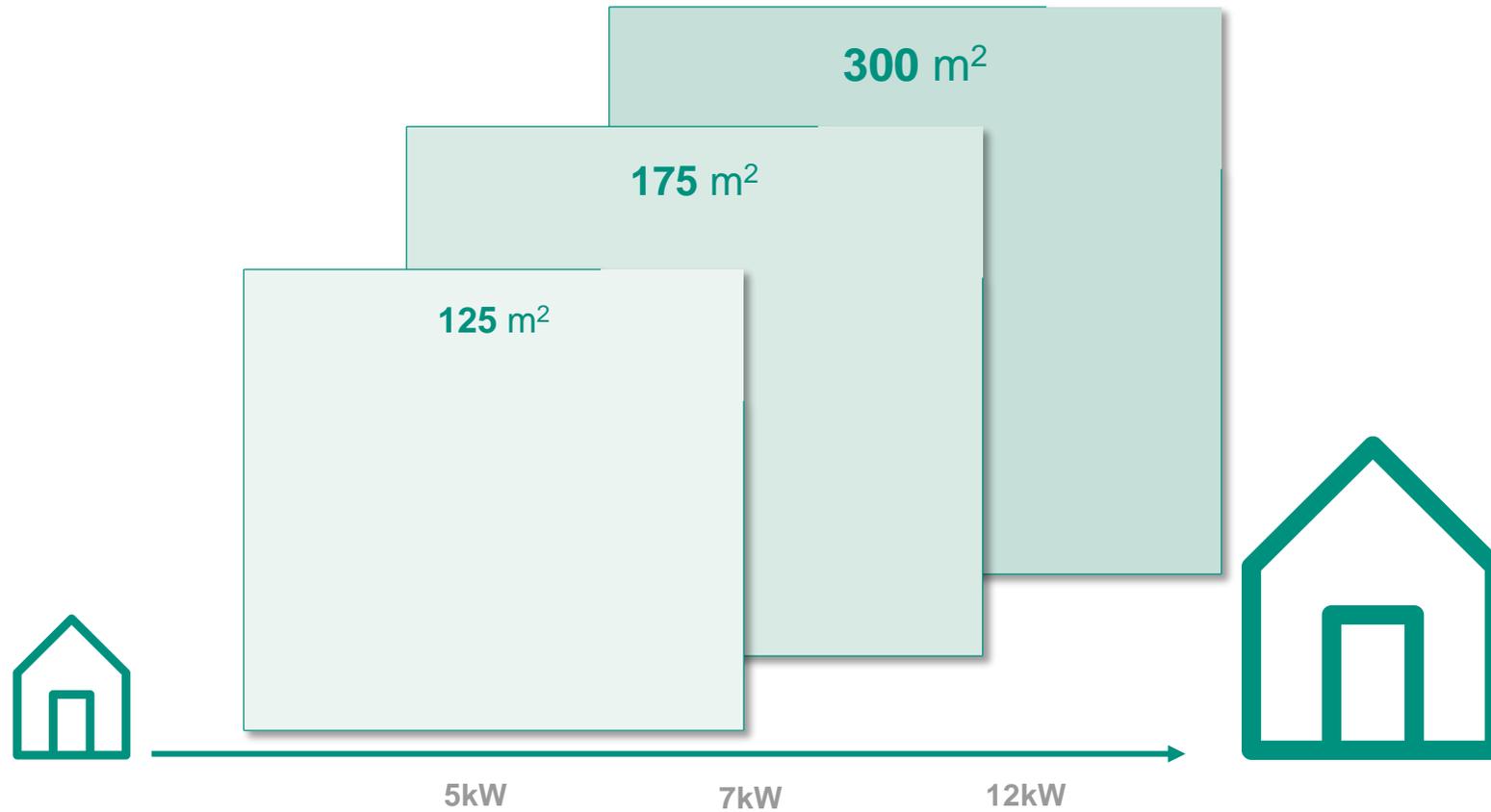
\* This is a assumed Peak heat loss, actually heat loss needs to be calculated and will vary regional and due to the type of build construction, assumption that insulation and double glazing has been fitted



Radiators

# Homes built between 2010+ assumed peak heating requirement of 40W/m<sup>2</sup>

Home with new heating system to comply with new Part L building regulations



With flow temperature of 55°C:

**RADIATOR READY**



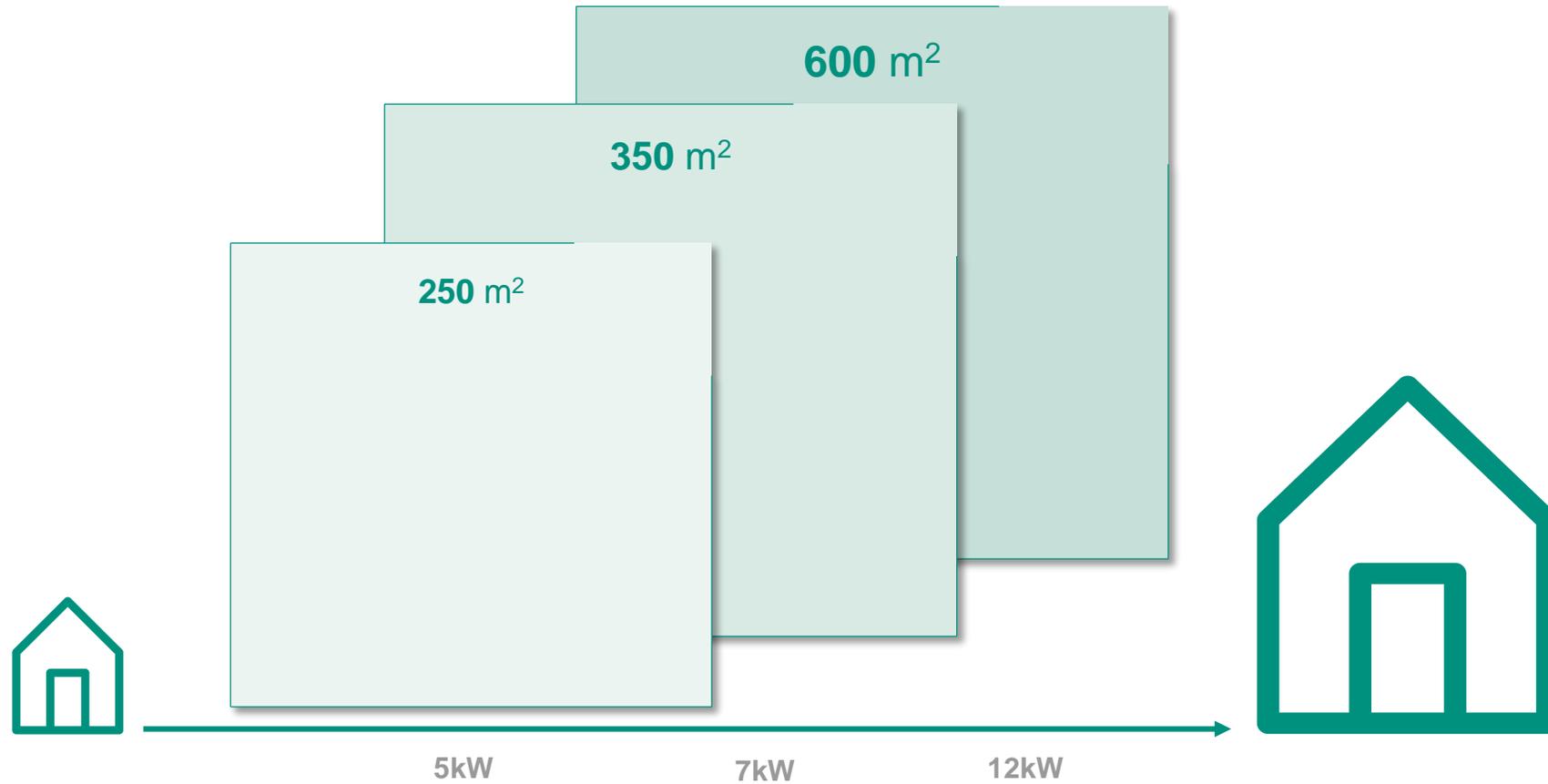
\* This is a assumed Peak heat loss, actually heat loss needs to be calculated and will vary regional and due to the type of build construction, assumption that insulation and double glazing has been fitted



Radiators

# Passive Home assumed peak heat heating requirement of of 20W/m<sup>2</sup>

Home with new heating system to comply with new Part L building regulations



With flow temperature of 55°C:

**RADIATOR READY**

*A Passive home would not have a radiator a system at 55°C this is show the size of home which can work with a heat pump*



\* This is a assumed Peak heat loss, actually heat loss needs to be calculated and will vary regional and due to the type of build construction, assumption that insulation and double glazing has been fitted

## Be ready for the energy change

And help your customers to reduce their CO<sub>2</sub> footprint

Natural  
refrigerant with

**GWP\*: 3**

\*global warming  
potential



Already fulfils the next NZEB requirements



GWP reduced from 2088 to 3\*



Going green with natural refrigerant



Even more energy independent with PV



## High quality & long lifetime

The wide range of development and production tests ensure a long lifetime - in all climate conditions



**23** Climate chambers  
with all conditions



**1** Super silent  
acoustic center



**100%** Production  
tests



## Full testing

High quality & long lifetime



### Salt water test

Spraying the heat pump continuously with salt water to test long-term impact.

### Acoustic test centre

Chasing of vibrations within the metal casing.

### 1 electrical interference test lab

Check for electrical interferences generated by the aroTHERM plus/ uniTOWER plus or impacts caused by external generated interferences.



### 23 climate chambers

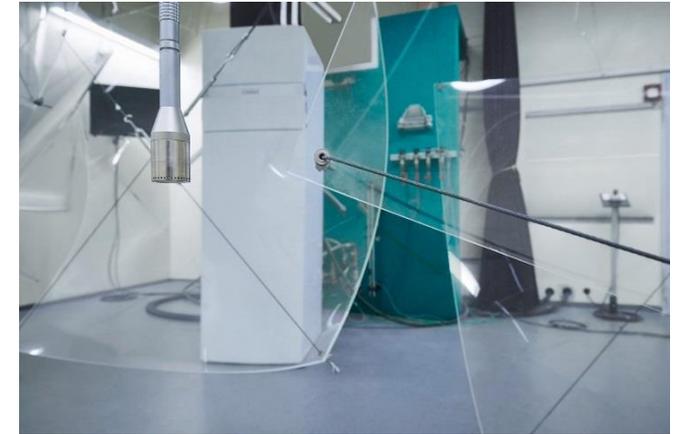
Test of operations even beyond standard working temperatures.

### Snow storm

Simulating snow storms in the climate chamber to ensure stable operations.

### Hail test

Dropping 1cm metal balls on casing to simulate hail impact.



## Long-term protection

High quality & long lifetime



### Easy clean nano coating

Ensuring long-term clean white casing by avoiding dirt deposit on the casing and continuous cleaning by rain water.

*(Colour coating with specific structure which avoid dirt depositing or growth of algae.)*



### Blue fin coating

Ensuring long life and efficiency by avoiding corrosion and blocking of evaporator.

*(Corrosion on the evaporator surface reduces the energy transfer resulting in heating and efficiency losses. Leakages could result in a break down!)*

*(Approx. 60% of all heat pumps have no evaporator coating, 35% have blue fin coating while 5% (e.g.: LG manufacturer) come with "golden" coating which is slightly better but disproportionally more expensive.)*

## High quality & long lifetime

From the seaside to the mountains: Designed to be used in all situations



### Mountains

Severe conditions  
down to -25°C and snow  
accessories



### Countryside

Large installations  
up to 12 kw units and  
15 m distance



### Cities

Really silent and  
compact even with small  
terraced houses



### Seaside

Salt resistant  
construction:  
C5 class (ISO 12944-6)



## Easy to understand control

Easy for you to set up the system control. Easy to use for your customers to use

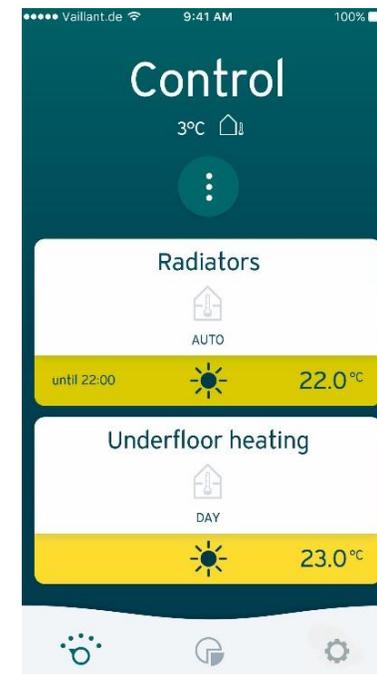
Appliance Interface



sensoCOMFORT



sensoAPP



Commissioning  
with  
**EASY**  
system control  
& Appliance  
Interface

- **Control installation wizard** guides you through the configuration process to avoid multiple visits just for control adjustments
- **One system control for the complete system** even with system extensions like ventilation
- **Connectivity options** allow remote maintenance



## Easy maintenance

Designed for easy maintenance – everything accessible from the front

- All major components for service accessible from the front
- Warranty period of **7 years**
- **15 years** guaranteed spare parts availability
- Additional **how-to video** support

Easy to

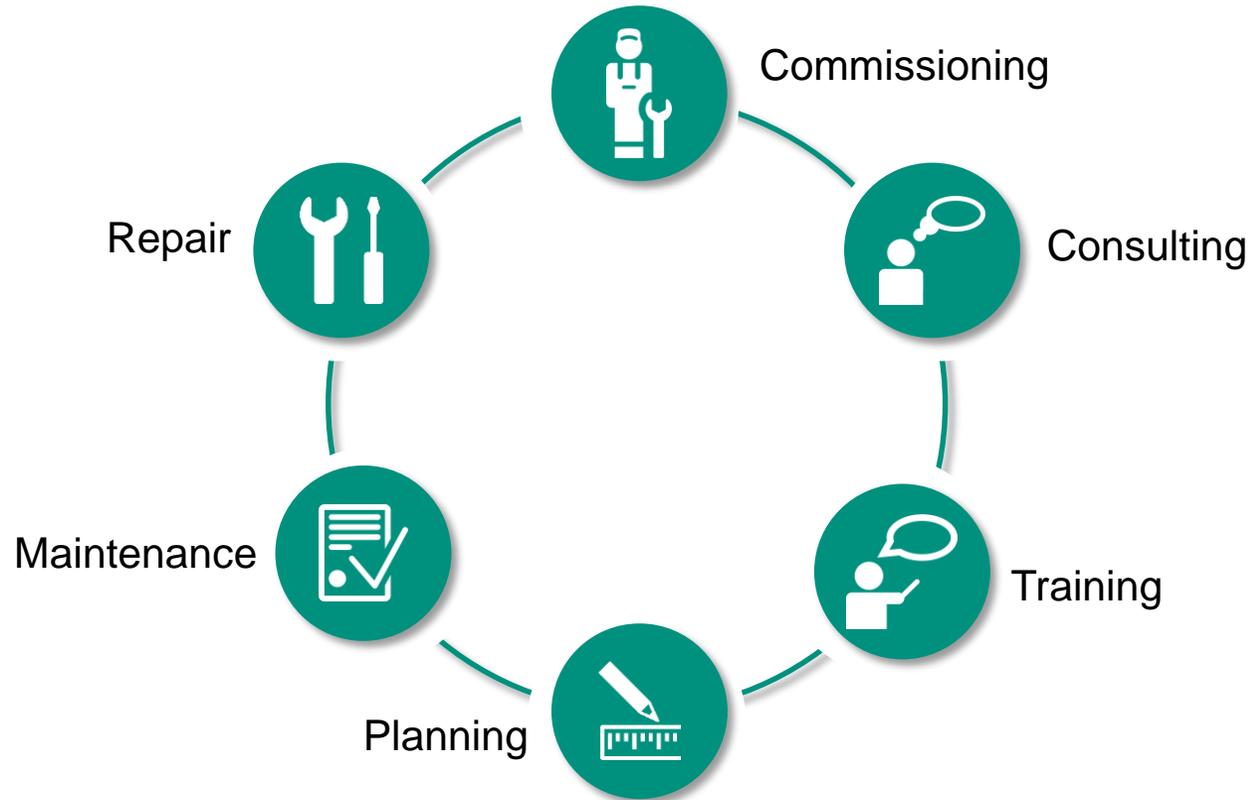
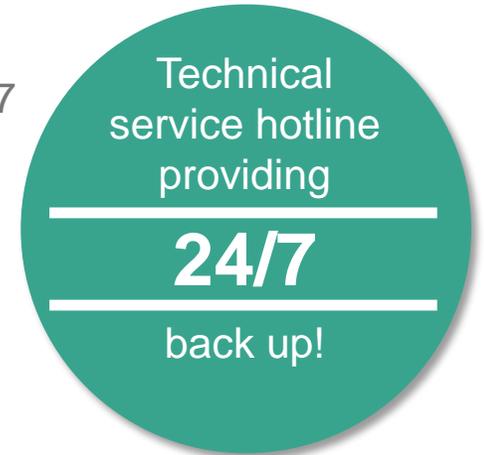
**MAINTAIN**

With straightforward  
piping and easy  
access



## Strong partnerships

Vaillant's extensive service network and technical service hotline backs you up in all situations - 24/7



- System planning and commissioning **support**
- **Technical service hotline available 24/7**
- **Nationwide** service organization
- **15 years** guaranteed spare parts availability
- **7 years warranty**

