# The decarbonisation of buildings: Turning ambition into action

**WEDNESDAY**
**MARCH 20**
**10:00AM CET**

A panel discussion on setting the framework for implementing EPBD and solutions from the RACHP sector.

EPEE

WEDNESDAY
MARCH 20
10:00AM CET

## Introductory Remarks

**Stefan Moser**
Head of unit, DG ENER

# PART 1: SETTING THE FRAMEWORK FOR THE DECARBONISATION OF BUILDINGS

# PART 2: NATIONAL AND LOCAL IMPLEMENTATION CHALLENGES & SOLUTIONS

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# PART 1: SETTING THE FRAMEWORK FOR THE DECARBONISATION OF BUILDINGS

**HVAC designer view on EPBD, concerning new and existing buildings**
EPB Center | Johann Zirngibl

**Letting the sunshine in: New provisions on solar rooftops and solar thermal energy for buildings**
SolarHeatEurope | Valérie Séjourné

**How to empower citizens in the switch to renewables at home: the gap-o-meter of support**
EEB | Davide Sabbadin

*Your service center for information and technical support on the new set of EPB standards*

# HVAC designer views on EPBD recast related to new and existing buildings

Johann Zirngibl

Board Director EPB Center

johann.zirngibl@epb.center

**The decarbonisation of buildings: Turning ambition into action**

March 20th, EPEE online meeting

# About EPB Center

https://epb.center/ - Contact: info@epb.center

## Mission and services

**Service Center** for **information, training** on **EPB standards:**

- provide **interested parties** (MS, industrials) **technical support**
- further **improve** the set of **EPB standards (CEN, ISO)**.

➢ **EPB Center Board Director**

- **REHVA** Vice president
- Convenor in **CEN and ISO standardization committees** related to the energy efficiency of HVAC systems
- Former Head of Division in a French public research center

-

# HVAC designer views on the EPBD recast final text

The **objectives of EPBD** are **clear** and **go in the right direction.**

**But** the **way how to reach these objectives** could be **improved,** (e.g. it sometimes **limits optimisation** of building performance).

**Next steps** (guidelines, delegated acts, national implementation) should be done in **close cooperation with building professionals,** because **ambition level, requested professional skills** are **high.**

**Harmonized implementation is key**
because only harmonization will allow **efficient development:**

- common **software tools** (e.g. for assessment calculation),
- common **training** (upskilling, capacity building),
- common **certification** / **qualification** of skills and professionals

# Why EPBD goes in the right direction?

The EPBD keeps, and enlarge, the **holistic** approach: 👍

- From **building component** to **energy carrier**: **primary energy**
- From **operational** assessment to **Live cycle analysis**
- Considering **all EU targets** by **adequate indicators**: **nZEB, ZEB**

  Energy efficiency first, use of renewables, decarbonation, healthy buildings, energy poverty and affordable buildings

# Why EPBD recast **limits** the **optimisation** of building performance?

**Example ZEB definition:**

By requesting *"not **any** **on-site** carbon emissions from fossil fuels*",

⇨ EPBD recast **reduce** the **possibilities** for building EP **optimisation.**

Example: **No compensation** of **fossil fuel emission** by exporting **renewables**

***The rational of this request is not understood*:**

Example: two technical systems:

- **On-site** technical system (cogeneration unit, boiler, hybrid heatpump) using **99% renewables** (hydrogen, biogas), **1% fossil fuel = not ZEB**
- **Nearby, distant** technical system (cogeneration unit, boiler, hybrid HP) using **1% renewables** (hydrogen, biogas), **99 % fossil fuel** = **possible ZEB**

Consequence: **high cost** for the **building owner**
(especially when "**nearby and distant" solutions** are **not available)**.

# Next steps: EPBD implementation

## Ambition level, professional skills = harmonization

- Calculation of the **life-cycle global warming potential**,
- Design of **ZEB buildings**,
- Defining and reaching optimal **indoor environmental quality**,
- Addressing **carbon removals** associated to **carbon storage.**

**New challenges** must be **put into practise** by **skilled professionals**

Only **harmonized implementation** will allow **efficient development**:

- common **software tools** (e.g. for assessment calculation),
- common **training** (upskilling, capacity building),
- common **certification** / **qualification** of skills

**Cooperation with professional associations in drafting technical support** (guidelines, delegated acts, standards, etc) **is key** for **turning ambition into action**

# Let the sunshine in!

## Decarbonising heat with solar thermal

**EPEE Webinar**

**Valérie Séjourné, Managing Director**

20 March 2024

#HeatIsHalf

# SOLAR HEAT EUROPE – Its members

SOLAR THERMAL NATIONAL ASSOCIATIONS

SUPPLIERS AND MANUFACTURERS OF SOLAR THERMAL EQUIPMENT & STRORAGE

PROJECT DEVELOPPERS & ENGINEERING COMPANIIES & ESCOs

RESEARCHERS, TEST LABS, CONSULTANTS

MEDIA PARTNERS

USERS OF HOT WATER & HEAT (private/ professional)

**Representing the full value chain of the Solar Thermal (ST) sector since 30 years towards EU policy makers/influencers.**

Aurinkoenergiayhdistys
austria solar
Belsolar
ENERPLAN
Syndicat des professionnels de l'énergie solaire
BSW German Solar Association
Holland Solar
EBHEK Cyprus Union of Solar Thermal Industrialists
Svensk Solenergi
Stowarzyszenie Producentów i Importerów Urządzeń Grzewczych
SWISSOLAR
EBHE

European Copper Institute
abora
alanod solar
MAGONTEC
Rheem
DUALSUN
alpak
Naked Energy.
SOLID
GREENoneTEC 1
HELIAC
AKOTEC
Savosolar
ABSOLICON
BDR THERMEA GROUP
TVP SOLAR
newheat
AALBORG CSP
VENMAN

AEE INTEC
cea
Fraunhofer ISE
CENER
trenkner consulting
THE smarter E EUROPE
IGTE
OST Ostschweizer Fachhochschule

Full list available here

# CLEAN HEAT from different solar collectors

**Non concentrated technologies** (T°C < 120-180°C):


Flat Plate (with single-axis tracker)


High-Vacuum Flat Plate


Evacuated Tube

Hybrid / PVT (Photovoltaic-Thermal)

**Concentrated technologies** T°C < 400°C):


Linear fresnel (concentrated solar heat)


Parabolic (concentrated solar heat)

The Solar Keymark
CEN Keymark Scheme

- Certification standards in place since 20 years
- > 1150 certificates
- CEN scheme
- Transparent and open
- +300 stakeholders

# SOLAR THERMAL: Market Segments

**« Small scale/ Buildings»**

**Residential**
(houses, apartments)

**Commercial**
(e.g. hotels, hospitals, leisure centers, shopping centers)

**« Large scale »**

**District heating**
(for cities, villages)

**Industrial**
(eg. paper, food & drinks, textile, chemicals)

# SOLAR THERMAL: Market Developments

- Sales growing since 2018 (except pandemic)
- Total installed capacity growing for 3 decades
- Some markets + 35% or higher **(IT, FR, NL)**
- Total installed capacity grew by 2,6% in 2022

**+12%**
market growth
(2022 vs 2021)

More than **10 million** rooftops in Europe are equipped with solar thermal & thermal storage

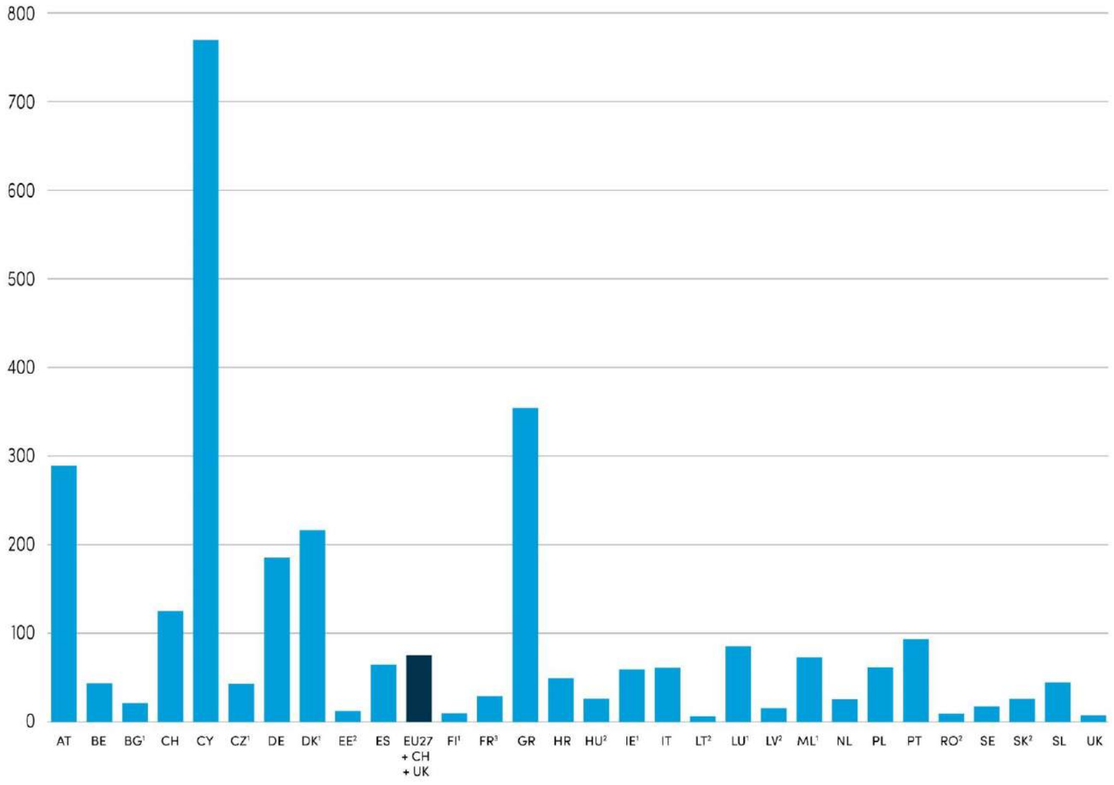
Total installed capacity in Europe (mainland): **40.5 $GW_{th}$**

That's **58 million $m^2$** of collectors

Countries with the largest Solar Thermal installed capacity (in operation):

- **15 470 $MW_{th}$**
- **3 808 $MW_{th}$**
- **3 708 $MW_{th}$**
- **3 053 $MW_{th}$**
- **2 568 $MW_{th}$**

## Use of Solar thermal per capita
in $kW_{th}$ per 1000 capita




1 Based on the EurObserv'ER "Solar thermal and CSP Barometer" (2022).
2 Solar Heat Europe estimations
3 The figures shown here relate to Metropolitan France (mainland). As a reference, in 2021 the newly installed capacity in overseas departments is estimated to be around 60 $MW_{th}$ (86 000 $m^2$).

# EU Fit for 55: An opportunity for Solar thermal

| Energy Efficiency Directive | Renewable Energy Directive | Energy Performance of Building Directive |
|---|---|---|
| Adopted 09/2023, into force 10/10/23 | Adopted 10/2023, into force 20/11/23 | *Adoption upcoming (Q1 2024)* |
| **11.7%** reduction of energy consumption by 2030 (vs 2020) (art. 4) | 42.5% target for **RES in 2030** (art. 3)<br>Binding target for **RES in H&C** (art. 23) | Solar Mandate (see next slide) |
| **National comprehensive assessments** for efficient H&C (art. 25) | Indicative **sub-sectoral targets** for:<br>- buildings (art. 15a): 49% RES by 2030<br>- for industry,<br>- and district heating (art., 22a, 24) | Minimum energy performance standards (MEPS) |
| **Mandatory H&C plans for cities** above 45,000 inhabitants (art. 25) | | Phase out financial incentives for stand-alone fossil boilers by 31/12/2024 |
| **Efficient District Heating & Cooling criteria** (art. 26) for new or substantially refurbished systems | Streamlined **permitting** procedures for renewable acceleration areas (art. 15c); and provisions for the installation of solar energy equipment and co-located energy assets (art. 16c) | One-stop-shops |

**THE SOLAR THERMAL SECTOR WILL CONTRIBUTE AND HELP MEET THE TARGETS**

# EPBD: the Solar Mandate (Art 10)

## Making the most of our rooftops with Solar Thermal (ST and PVT)

**On NEW public and non-residential buildings >250 m2**


Dec 24

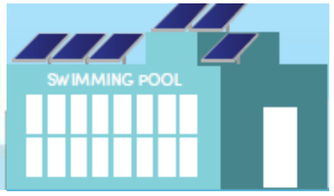
Dec 25

**Dec 26**

**On EXISTING public buildings >2000 m2 & On on-residential buildings > 500 m2***

**Dec 27**

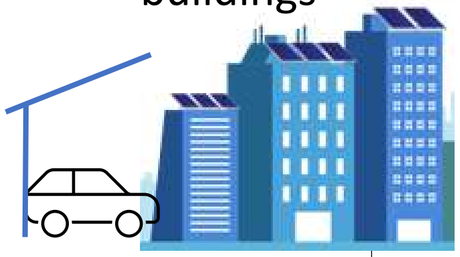
**On EXISTING public buildings > 750 m2**




**Dec 28**

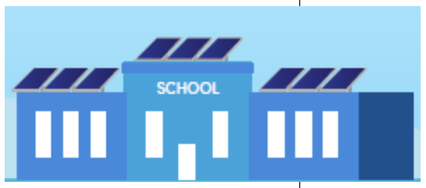
**On NEW residential buildings**

**On NEW roofed carparks** adjacent to buildings



**Dec 29**

**On public buildings > 250 m2**



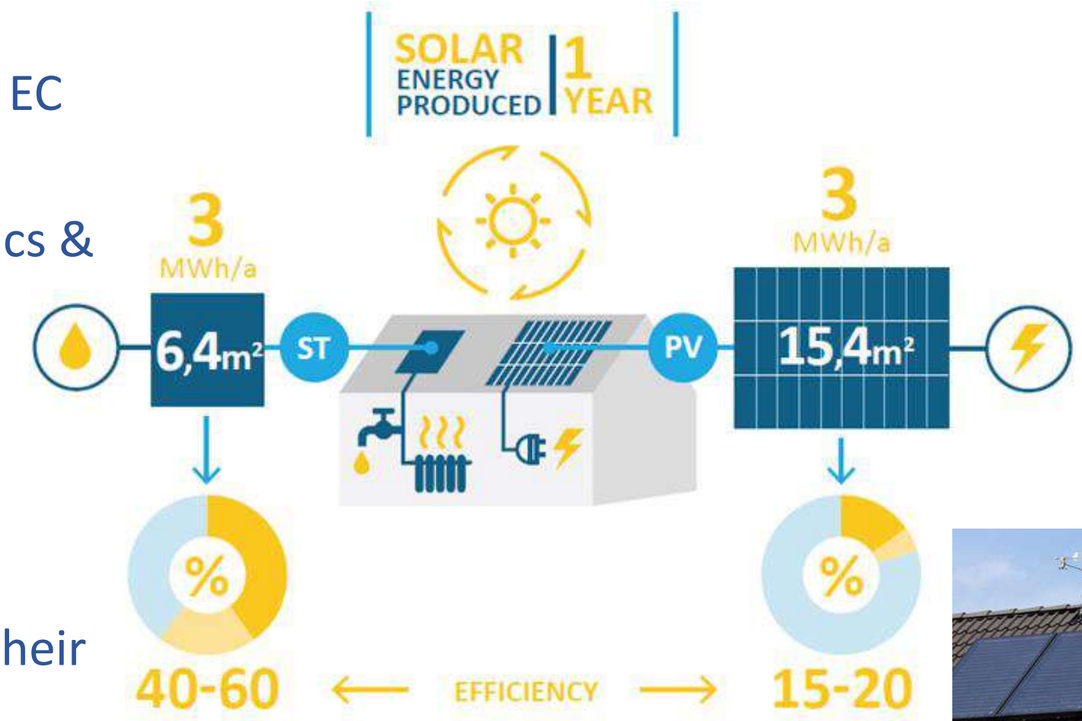

**Dec 30**

*in case of major renovation, action requiring a permit, works on the roof, or installation of a technical building system (i.e. heating system)

# EPBD: the Solar Mandate (Art 10)

## EPBD guidelines:

- Solar Heat Europe will provide input to EC and Member States
- This is a mandate for BOTH photovoltaics & thermal, incl ST and PVT
- Alert about potentially biased interpretation of current text of the Directive
- => Propose options for fair national frameworks to be used when drafting their national transposition




# Solar Thermal can be combined with all energy sources

ENERGY SAVINGS & EFFICIENCY

SOLAR THERMAL

including STORAGE

+

**Fossil fuels**
(gas, oil)

**Other direct renewable heat supplies**
(geothermal, biomass)

**Other heat supplies**
(eg waste heat, biogas etc)

**District heating networks**

**Heat pumps**

**Indirect renewable heat supplies**
(solar PV)

**Other indirect heat supplies**
(electricity eg nuclear)

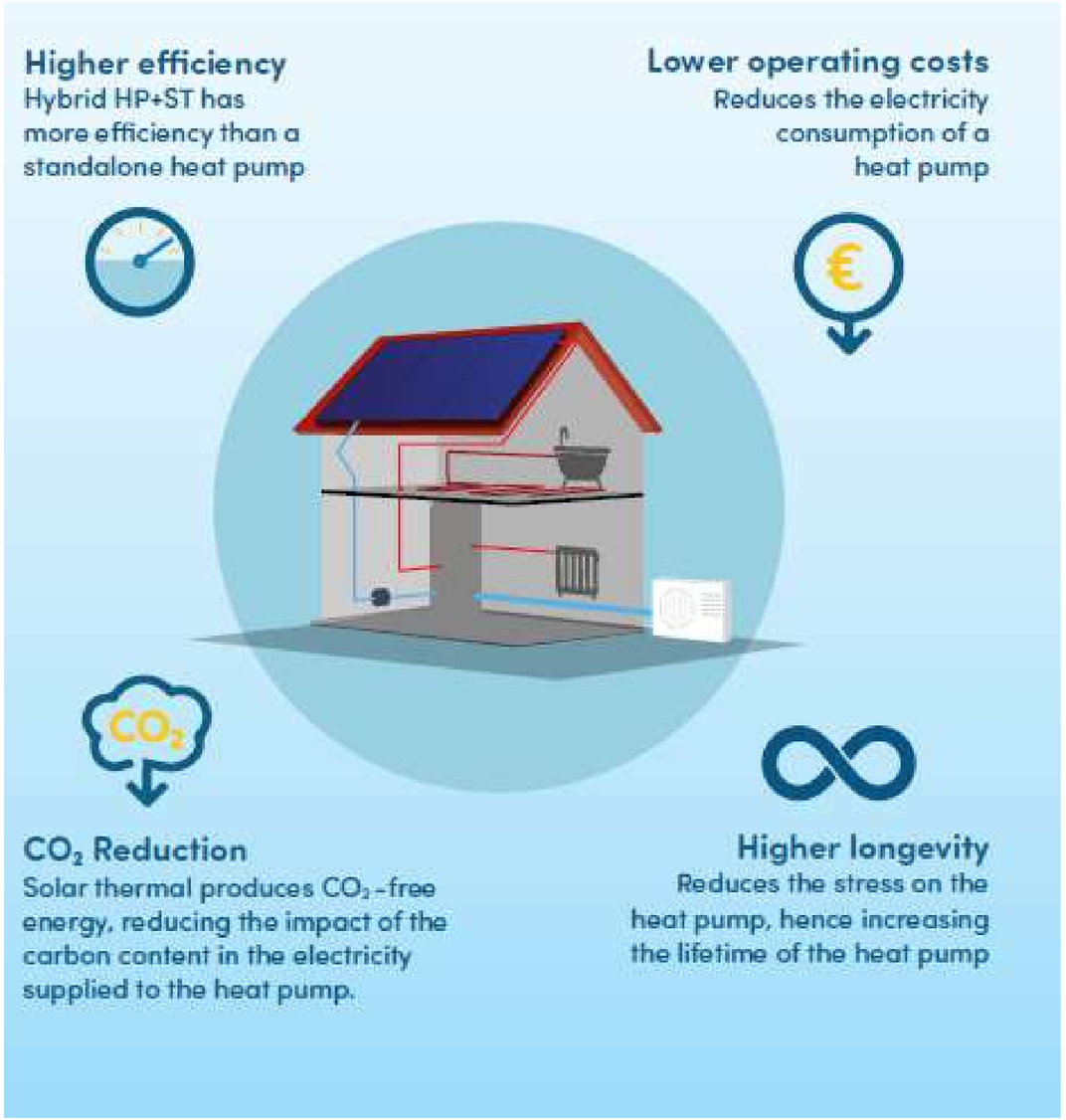
=

CLEAN & RENEWABLE

HEAT

# Solar Thermal can easily hybridise with a Heat Pump

**Increased efficiency and durability of the whole system**



# In conclusion

## Solar Thermal:

- Has its role in the heat decarbonisation agenda
- The current legislative package offers an opportunity for our sector to flourish (buildings, district heating, industry)
- Implementation is critical

- **Fair treatment** of all technologies is key – Fair competition
- **Awareness** is key – Opportunity to work with all partners, with one-stop-shops etc
- **Enabling conditions** to support and encourage the adoption most efficient solutions to be adequately framed (finances, skills)

# Contact us!

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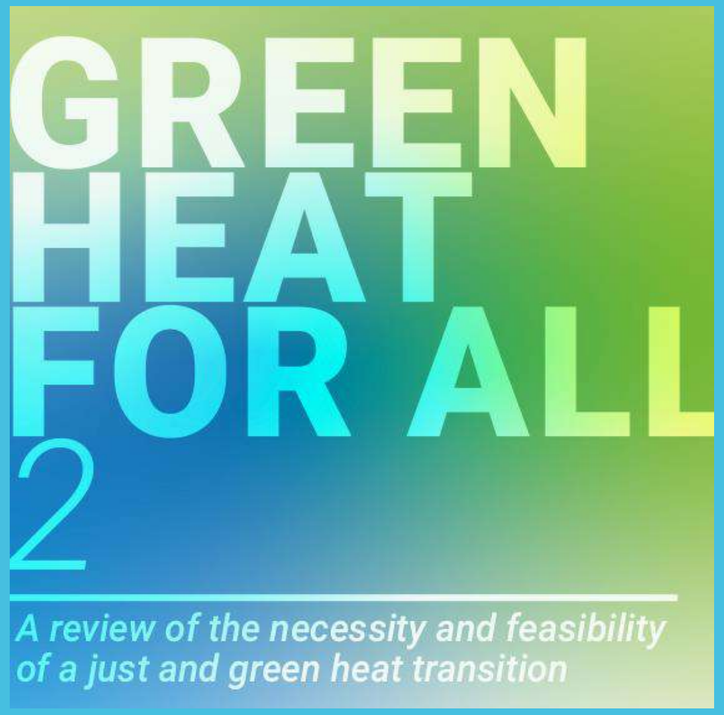


*2 EDITION*

# GREEN HEAT FOR ALL

## A REVIEW OF THE NECESSITY AND FEASIBILITY OF A JUST AND GREEN HEAT TRANSITION

**20.03.2024**

**Davide.sabbadin@eeb.org**

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# Why this study

- the **Ecodesign and Energy labelling** of the space and water heating technologies have been paused
- The **EPBD has just been voted in the EP** -
- Stong negative narrative, in DE and elsewhere, have depicted renewable energy as "too expensive" and have fuelled anti-EU sentiments
- We want to bring a contribution to the debate to give perspective



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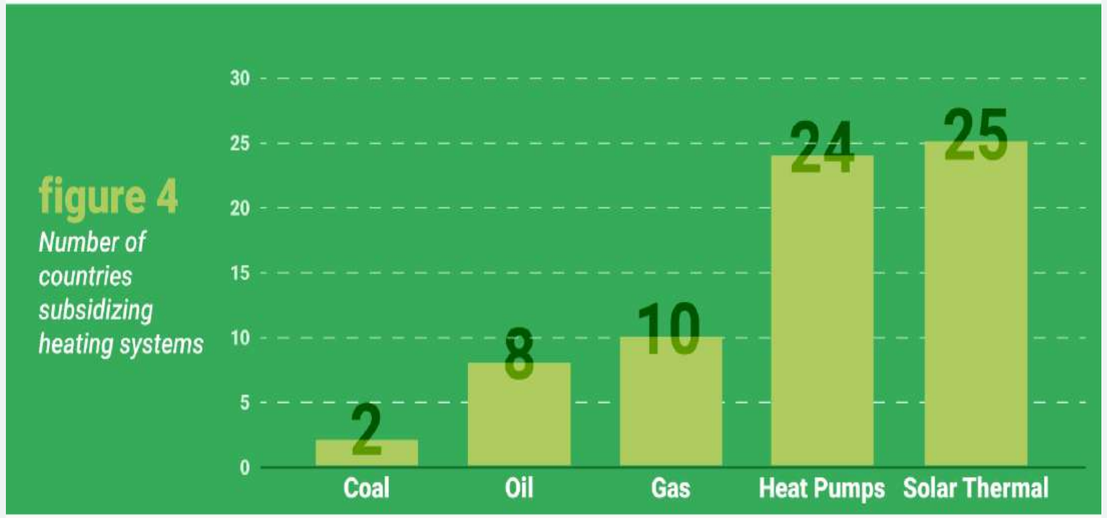
# What did we analyse?

- **Member States' National Energy and Climate Plans 2030 drafts,** where we analyzed approach to heating in terms of emissions and renewables (*not included in this presentation*)
- **Subsidies and incentives** for the purchase of **heat pumps** and solar for energy decarbonization
- The **gap** between **subsidies in place** and the **amount needed to support** even the most disadvantaged households by addressing upfront costs that are often unaffordable for them.

# Incentives for RE and fossil heating tech in EU

"Italy and Poland still generously finance fossil fuels' boilers"




Supporting fossil in Sept 23

- 9 national gov. + 2 local gov.
- BE and HU supports coal*

Supporting Renewable heat

- 24 countries (for solar 25)

- RO and EE did not support either fossil or RE heating.



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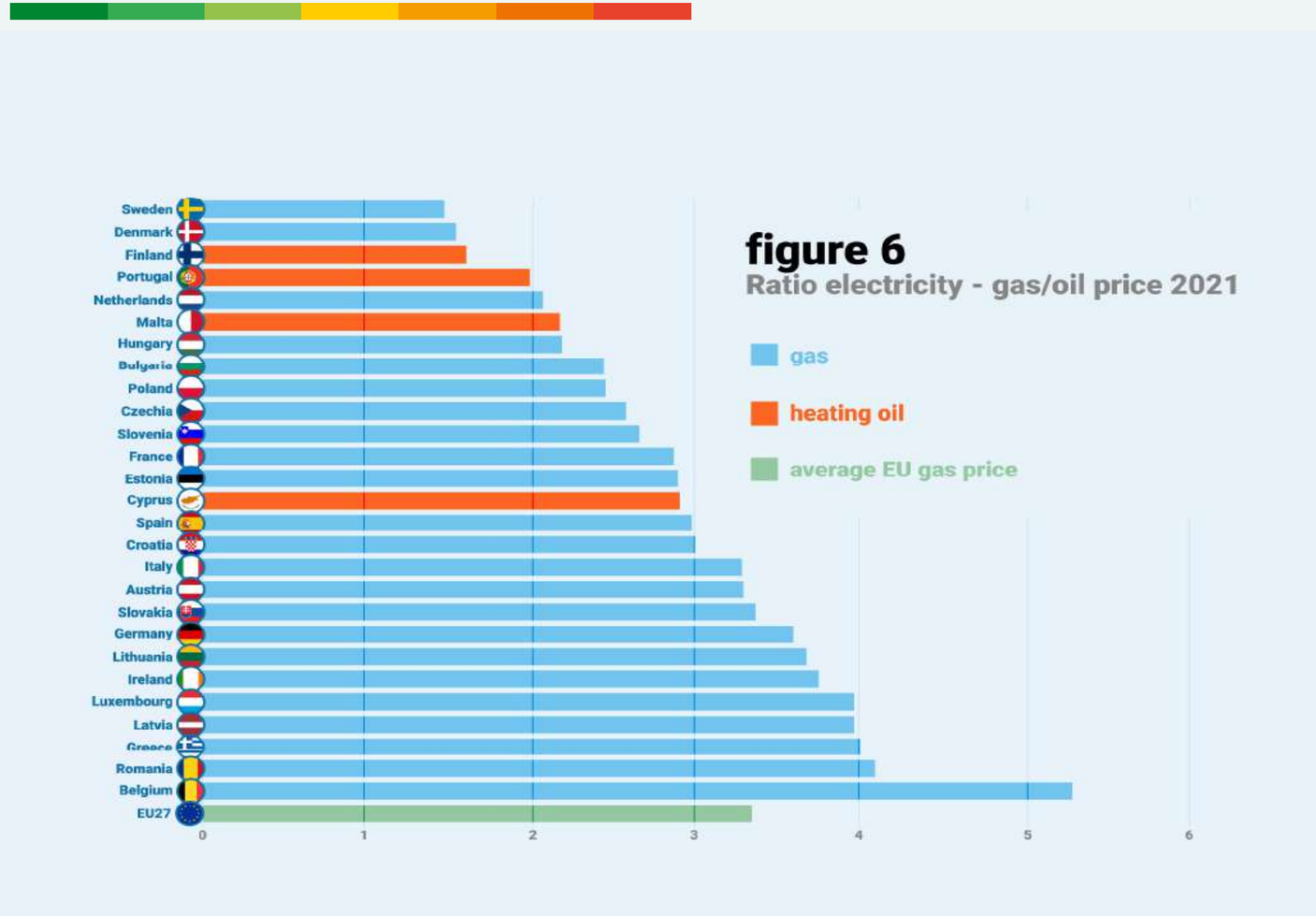
# Ratio electricity – gas/oil price 2021




- The ratio exceeds 3.6 in 6 countries and is close in one country
- When the ratio exceeds 3.6 the fuel cost is higher for an air source heat pump than for a gas or oil boiler
- Several countries are past that ratio in the EU at 2021 prices.
- Luckily the calculations must be **carried out over the lifespan of the product**



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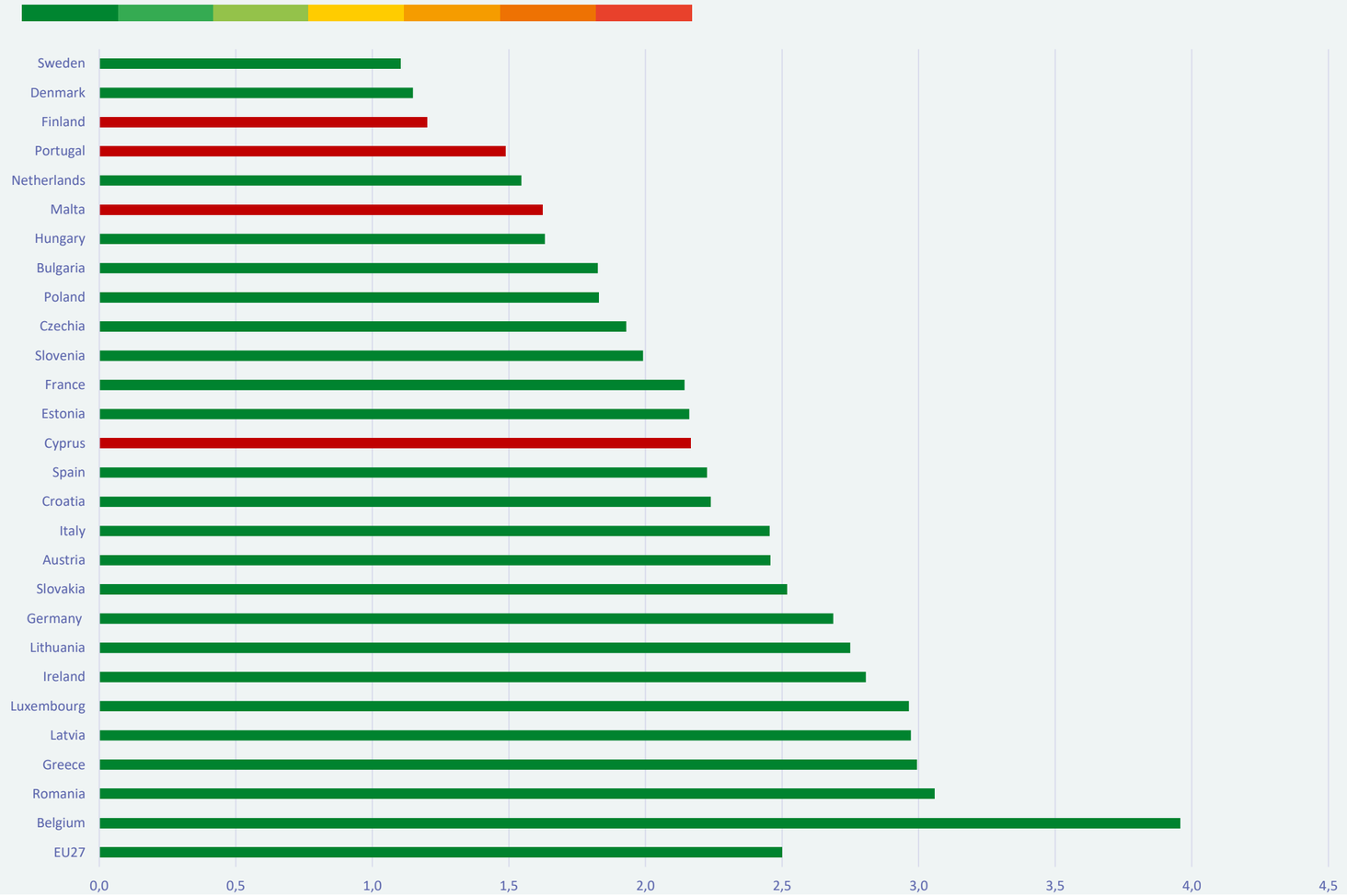
# Ratio electricity – gas/oil price 2023-2040




- The ratio exceeds 3.6 **only in Belgium**
- Countries in red is where oil is used for comparison
- Our ratio differs from others because **it includes subsidies** for purchase/install.



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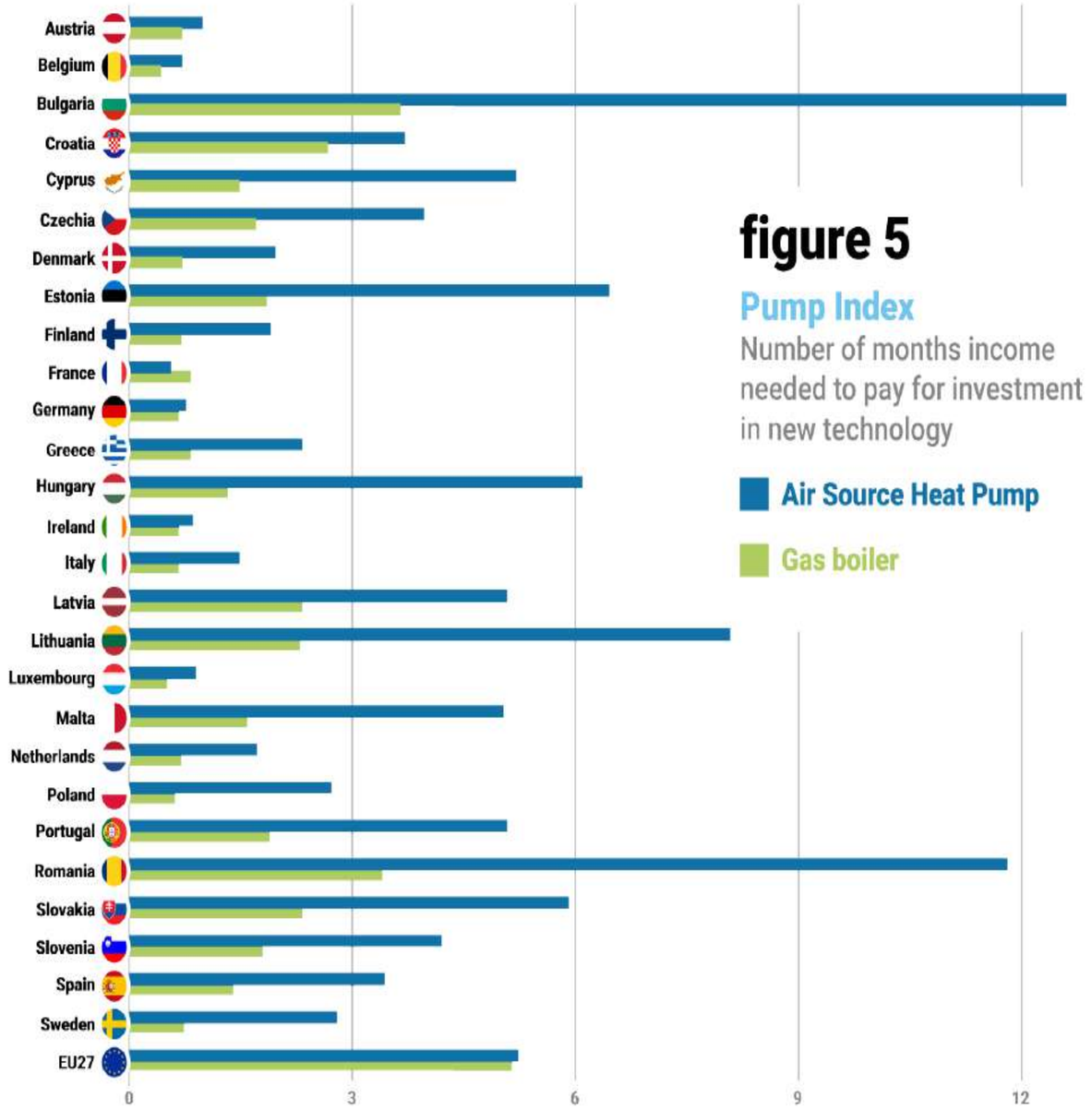


# HP vs Salary

- Upfront costs are still higher for an air source heat pump compared to a gas boiler in most countries: support is needed
- In Bulgaria and Romania the cost is equal to a 1 year salary for a mid-to-low-income household.
- These two countries are also among the ones with the least support for HPs and solar



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# Results

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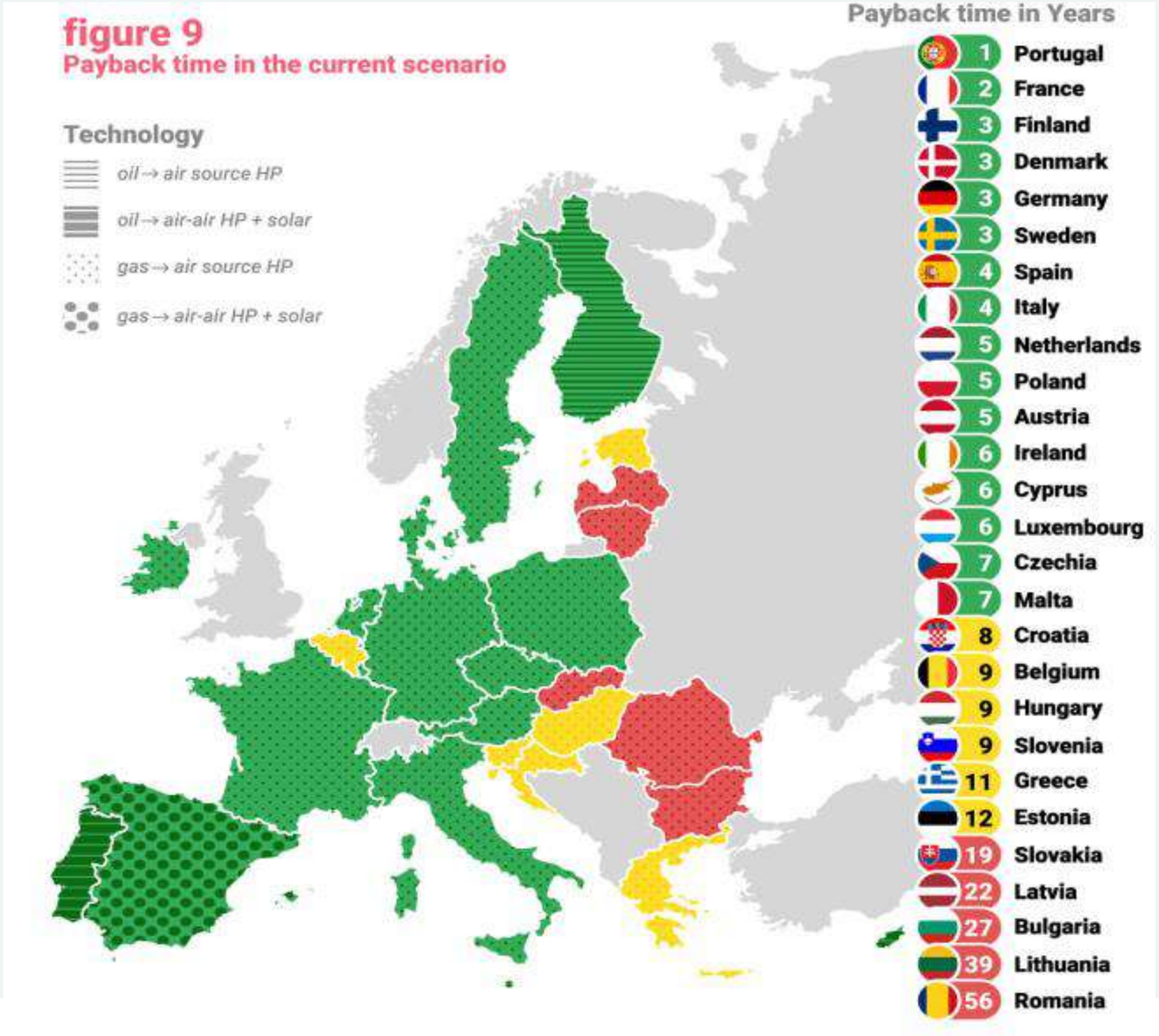


# FINANCIAL CHALLENGES

- The initial cost of heat pumps is still much higher than that of gas boilers in many countries, making the payback period **more than 7 years**, sometimes even with incentives.

- In 4 countries in particular, the payback time of the investment is longer than the average life of the product.

- The differences between member countries are very marked, and are determined by both average income and the absence or presence of incentives.

- **Subsidies are a key aid** for those households wishing to decarbonize their heating, but **sometimes they are not enough.**



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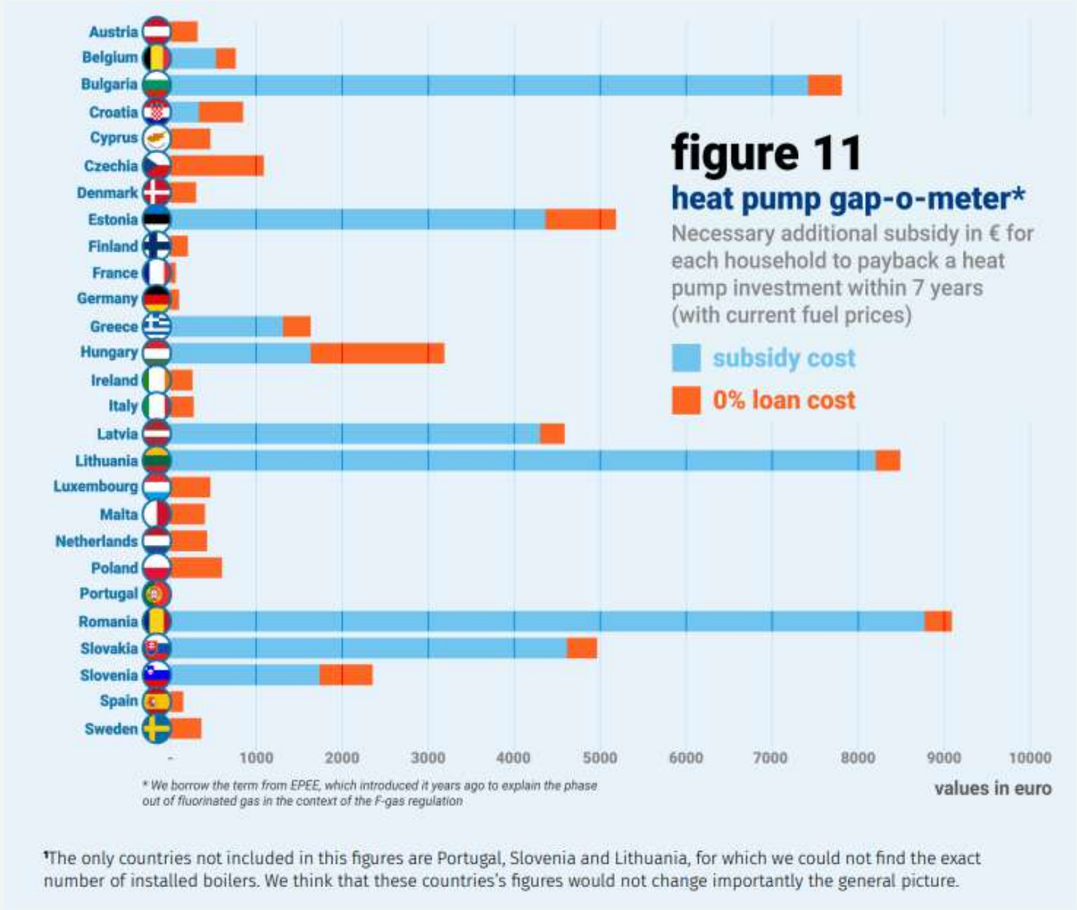
# THE HEAT PUMP GAP-O-METER*




With the **"heat pump gap-o-meter"** we quantified the number of boilers in different countries and calculated the expenditure needed to make the heating sector carbon neutral by 2040.

The total projected cost of achieving this goal, excluding biomass and district heating, is about €21.3 billion.

This includes the cost of a 0% loan to 30% of the households to cover all upfront costs.

*GAP-O-METER is a term originally invented by EPEE



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# Conclusions

How can we put this all into perspective?

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# To put this all into perspective

- The total amount of Extra investment is 21.3B. Divided into 15 years, that makes some **1.4B/year**
- Our latest report "mission possible" by trinomics, indicated that the subsidies for fossil boilers in 2022 were in the order of 3.2B
- **This means that if we re-direct the fossil subsidies to extra support for RES heating & cooling, that would more than enough to allow everyone to be onboard.**

# Our suggestions

- Immediate stop to fossil fuels heating tech incentives
- Stage phase-out of fossil boilers from the market ASAP
- Redirect funds to HPs and Solar
- Earmark the Social Climate Funds largely to low-income
- Introduce HP tarifs in all Member States
- Promote different business model to spread the technology (pay per use, leasing, heat as a service etc).

# PART 2: NATIONAL AND LOCAL IMPLEMENTATION CHALLENGES & SOLUTIONS

**Integration of renewable energy in district heating and cooling networks, and the role of large heat pumps**

EHPA | Jozefien Vanbecelaere

**The decarbonisation of all buildings: Heating and cooling solutions from the RACHP sector**

EPEE Working Group Chair | Christina von Westernhagen

# Integration of renewable energy in DHC & the role of large HP

Jozefien Vanbecelaere, EHPA Head of EU Affairs

20 March 2024

# About EHPA

**Our vision:**

In a fully decarbonised Europe, heat pump technologies are the number one heating and cooling solution. They are a central part of a renewable, sustainable and smart energy system.

More: ehpa.org

**Founded in 2000**

**218 members representing the entire value chain**

- Heat pump and component manufacturers
- National associations
- Test labs
- Utilities and consultancies
- Research institutes and universities

**39 countries**

**International cooperation with**

Comprehensive Economic Cooperation Agreement (CECA)
International Energy Agency - Heat Pump Centre (IEA HPC)
International Renewable Energy Agency (IRENA)
Heat Pump and Thermal Storage Centre of Japan (HPTCJ)

# Heat pumps are mature and used everywhere

White goods and cars

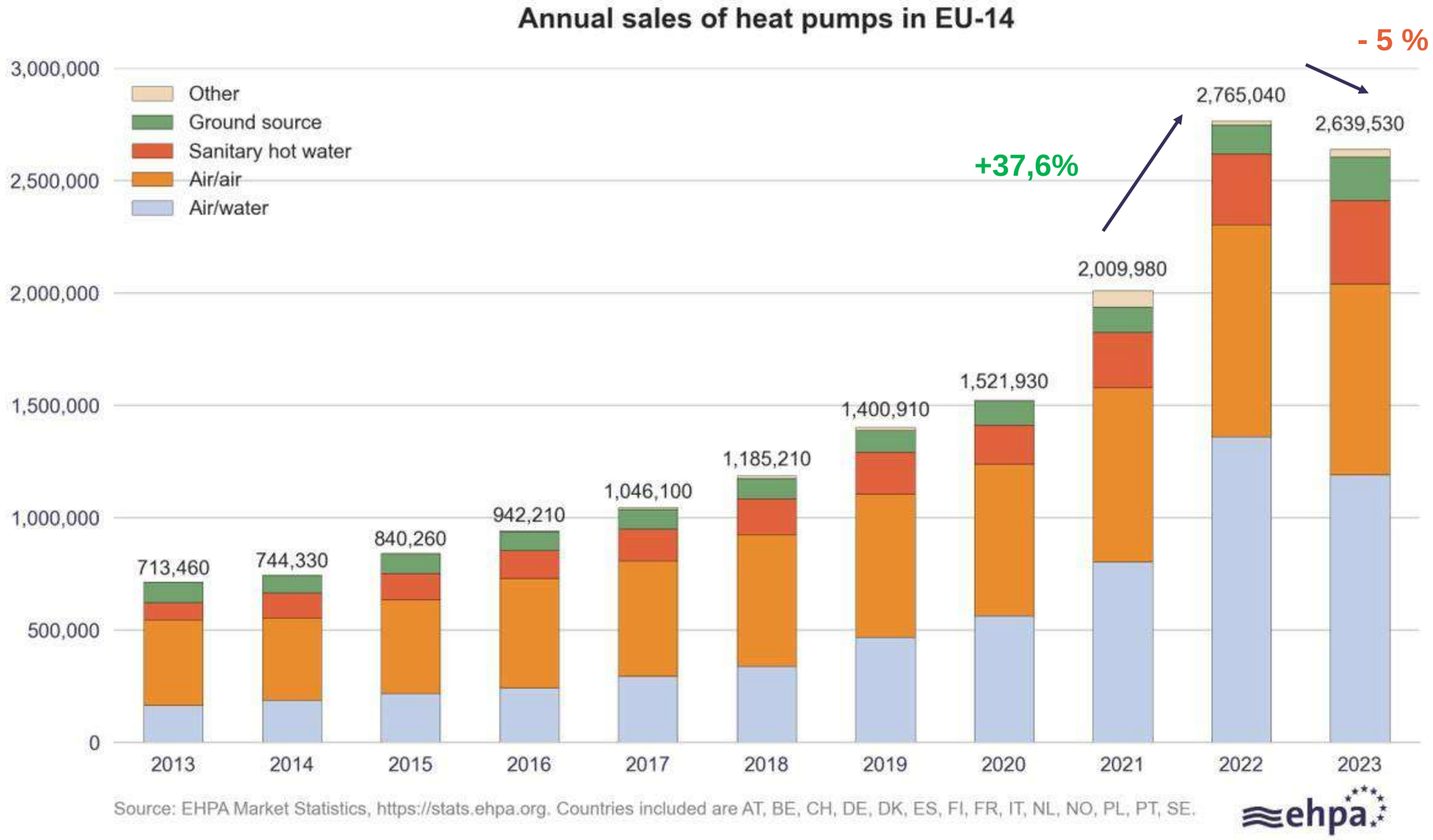
Commercial applications

Residential applications

Industrial applications and district heating

Big buildings

# Heat pump sales fall by 5% in 2023



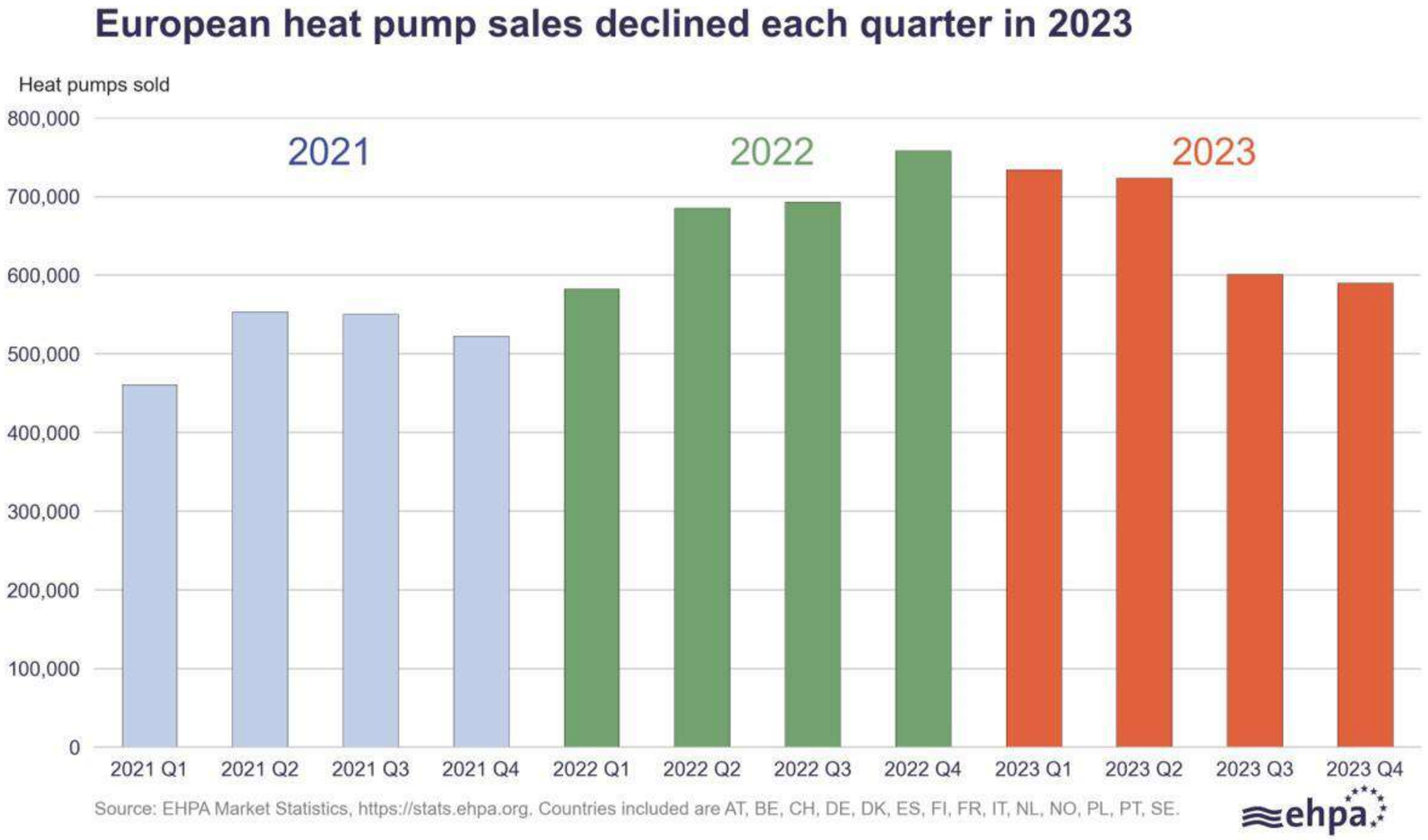

**Reasons**

- Gas price
- Electricity price
- High interest rates
- Political debate
- Reduced ambition
- Uncertain subsidy schemes



ehpa

# A cautious outlook for 2024?



# HVAC companies – cost down actions taken to face HP slow down

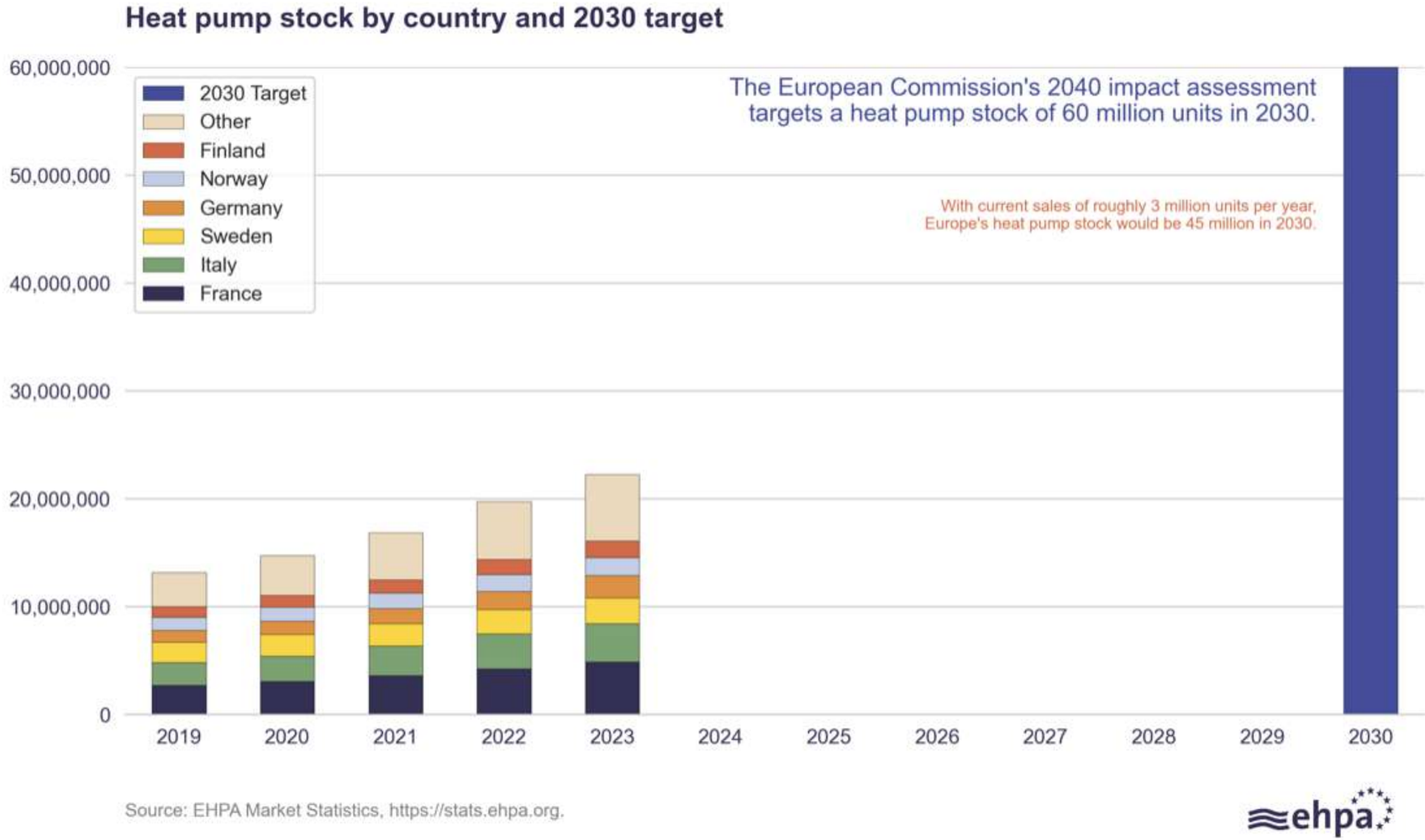
| Company | Cost down actions | Country impacted | Date of the information |
|---|---|---|---|
| DAIKIN | • Daikin to cut **500 jobs** as heat pump demand falls<br>• In addition, the company will ask 870 permanent Ostend workers to take 12 days of economic unemployment before the end of December. link |  | SEPT 21st 2023 |
| Vaillant | • Vaillant Group has introduced short-time work for around **100 employees** at their factory in Remscheid<br>• The production shifts there have been reduced. link |  | OCT 2023 |
| Saunier Duval | • Partial unemployment started end of October 2023 at the Saunier Duval industrial site<br>• Around **500 employees** (production operators, team leaders, support functions) are affected by this forced rest<br>• Lasting "twelve days to twenty-two days". The use of temporary workers is also frozen. link |  | OCT 20th 2023 |
| NIBE | • Nibe has implemented a programme to reduce staff and other fixed costs as well as reduction of inventories and balancing of investment.<br>• The programme, which is expected to bring annual savings of around SEK600m (€53.2m), primarily aims to streamline the full organisation and will, affect around **500 employees.** link | Not provided | FEB 17th 2024 |
| STIEBEL ELTRON | • short-time work for some of the employees at the company's headquarters in Holzminden.<br>• Short-time work is scheduled to start in March for the approximately 800 employees. link |  | FEB 18th 2024 |
| GROUPE ATLANTIC | • Factory in north of France operating only 2 days per week<br>Production of 250 units per day instead of 500<br>• Partial unemployment put in place<br>**500 employees** impacted (100 employees currently working instead usual 600 ) link |  | FEB 19th 2024 |

# Market is reflection of policy - EU

## Q2 2022


## Q4 2023

# We need average growth of 17% to achieve 60 million heat pumps by 2030



# HEAT PUMPS: THE HEART OF EUROPE'S ENERGY FUTURE

## European Heat Pump Association - EU policy priorities 2024-2029

Heat pumps offer a clean, cost-effective way to decarbonise heating and cooling. Three to five times more efficient than gas boilers, they slash energy imports, energy use, and greenhouse gas emissions. Heat pumps also provide stability against fluctuating energy bills.

To unlock their full potential, EU legislators and decision-makers must take the lead in developing the necessary policy and financial conditions for the acceleration of the clean energy transition.

The European Heat Pump Association (EHPA) has outlined **five key priorities to put clean heating and cooling at the heart of Europe's energy system today for a brighter tomorrow**. Here's an overview:

### Set clear policy direction and targets

Ensuring consistent, streamlined and ambitious long-term policies on heat pumps is vital for attracting demand for them and investments in the EU's manufacturing and workforce.

### Make heat pumps affordable for all

There is an urgent need to shield low-income households from high energy prices and support their access to cleaner and, ultimately, cheaper to run heating and cooling solutions like heat pumps.

### Strengthen industrial leadership and skills

Europe's heat pump sector is a world leader. It provides more than 161,000 direct jobs already today, with the potential for many more.

### Unlock the full potential of large heat pumps

Large heat pumps serve a crucial role in industrial electrification and energy integration. Able to reach 200°C, they can efficiently utilise waste heat from industrial processes, wastewater, and other sources for district heating and industrial applications, so boosting circularity.

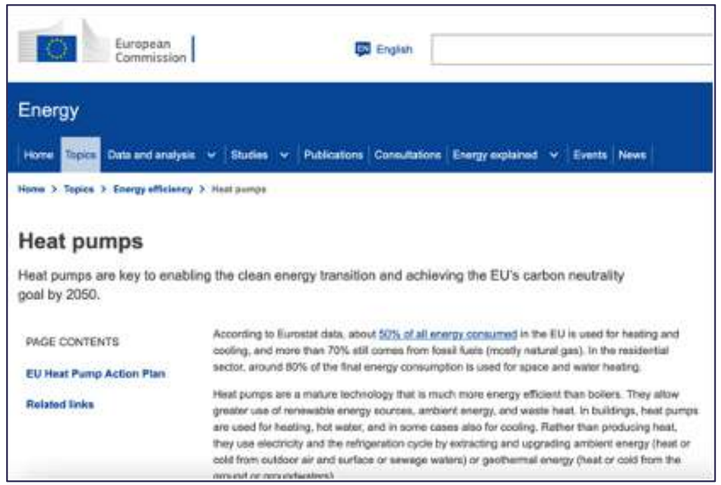
### Use heat pumps' flexibility to support the energy system

Heat pumps provide flexibility by heating when electricity costs are low and shutting off during peak times, reducing costs for the EU's energy system and consumers.

**Read EHPA's manifesto in full**

# 1. Set clear policy direction: EU heat pump action plan without delay


From mid 2022: EHPA stresses: "**We need a heat pump accelerator**"

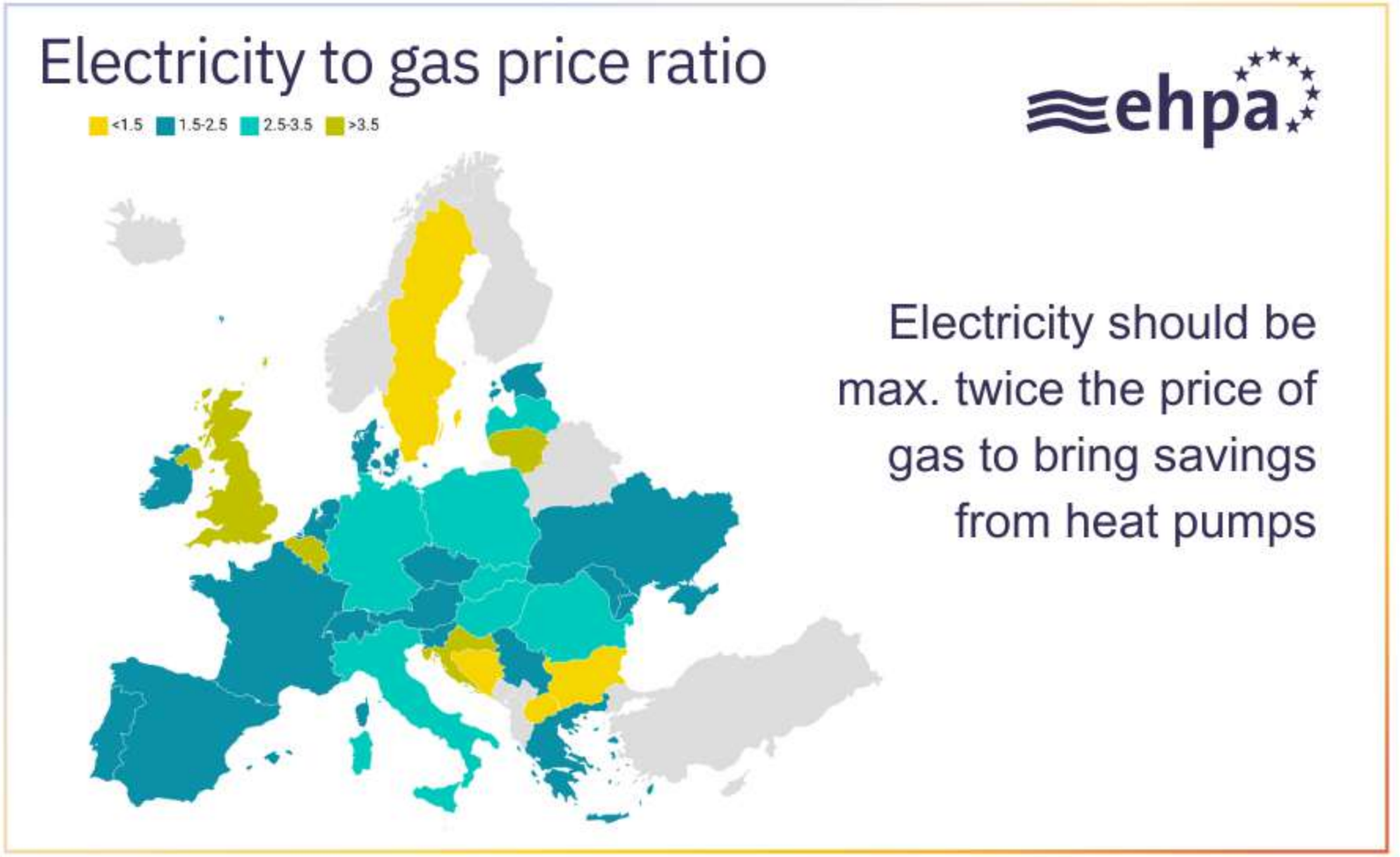



**Q1 2023:** EC endorses and announces Heat Pump Action Plan + dedicated webpage


**June 2023**: EHPA launches Heat Pump Accelerator

**Q4 2023**: EC postpones Heat Pump Action Plan until after EU elections ….

# 2. Make heat pumps affordable for all

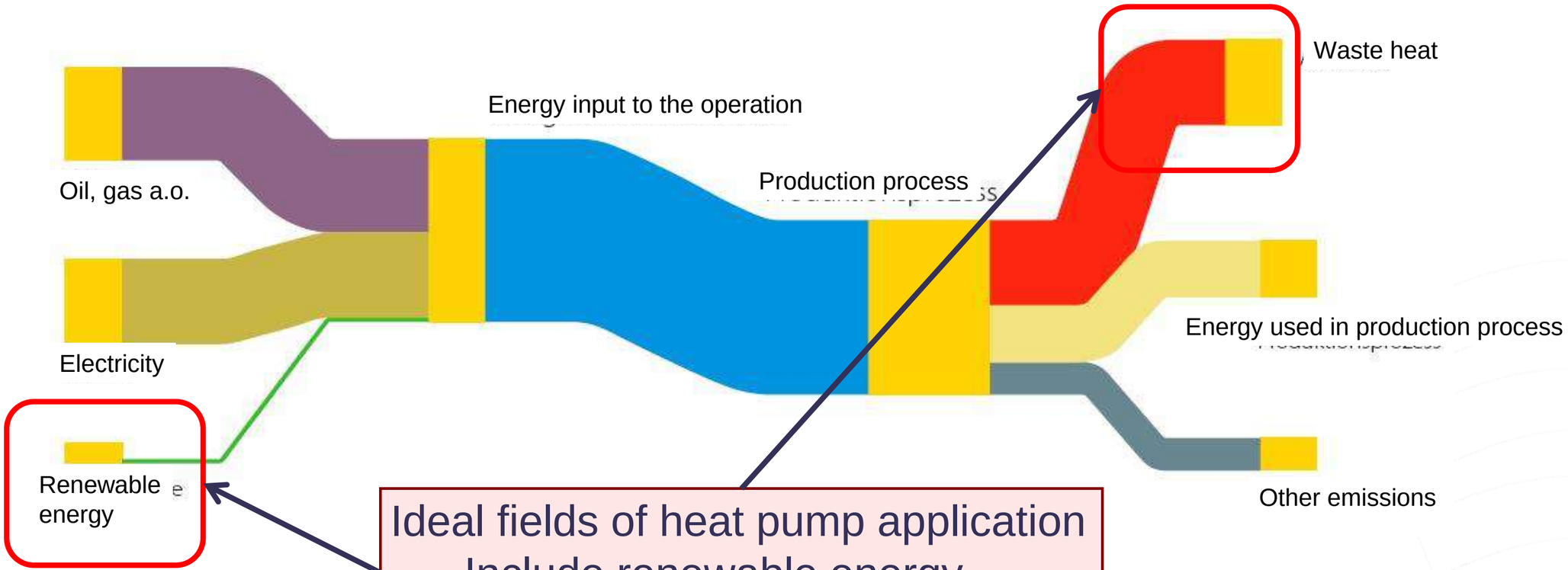


# 3. Unlock the full potential of Industrial/Large heat pumps

- High temperature: 80°C to 200°C (soon 250°C)
  - DHC: 90°C
  - industrial HPs: 120 – 200°C
  - current prototypes expected to deliver beyond 200°C
- High capacity: 100kW – 50MW



# Heat pumps in industrial applications (and district systems) = „closing energy cycles“

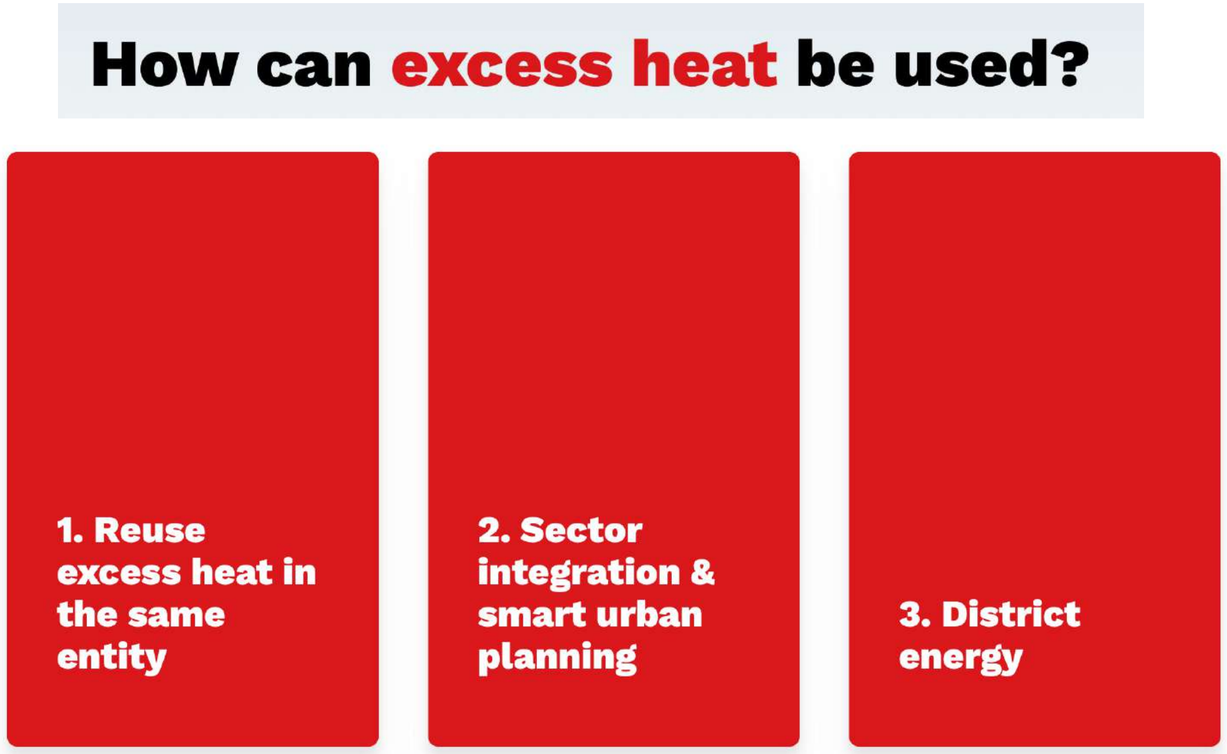



Ideal fields of heat pump application
- Include renewable energy
- Make use of waste heat

# Regulate the re-use of waste heat

On waste heat from cooling:

- Each installed MW of cooling capacity results in 1,2 MW of waste heat capacity
- At 3000 operating hours/year, this means 3,6 GWh of excess heat that is discharged wasted to the environment “Thermal waste or thermal pollution”
- Generating this amount of heat with gas-based heat plants, requires about 400 000 $m^3$ of fossil gas




*Source: Danfoss*

# FIT for 55 PACKAGE

## THE MAIN WAYS IT WILL BOOST HEAT PUMPS

### RED
**RENEWABLE ENERGY DIRECTIVE**

- 42,5% renewable energy in total energy consumption by 2030*
- Faster permitting process for heat pumps
- EU countries should reduce fossil fuels & increase renewables in industrial heating <200°C
- EU countries should promote (electrified) renewable heating & cooling to reach 49% renewables in buildings by 2030*
- Increase renewables in heating & cooling by 0.8 percentage points / year to 2025; 1.1 / year from 2026-2030*
- Possibility to include renewable electricity for heating and cooling in annual targets

**Binding*

### EED
**ENERGY EFFICIENCY DIRECTIVE**

- 11.7% reduction in energy consumption by 2030*
- Policies promoting direct fossil fuel combustion not counted toward energy savings from 2024
- Waste heat recovery required for data centres with an energy input over 1 MW
- Gradual increase of national energy savings obligations: 1.3% (2024-2025), 1.5% (2026-2027), 1.9% (2028-2030)
- For savings in kWh electricity, the Primary Energy Factor is set to 1.9, revised every four years*

**Binding*

### EPBD
**ENERGY PERFORMANCE OF BUILDINGS DIRECTIVE**

- By 2030, all new buildings should be Zero Emission Buildings and by 2050 all buildings
- National building renovation plans shall include measures to phase out fossil fuels in heating and cooling, with a view to phasing out all fossil fuel boilers by 2040*
- EU countries shall not provide financial incentives for the installation of stand-alone fossil fuel boilers*
- EU countries may encourage the switch to non-fossil fuel based systems
- Minimum energy performance standards are established, addressing the worst performing buildings first

Definition of Zero Emission Buildings: "A building with a very high energy performance [..], requiring zero or a very low amount of energy, producing zero on-site carbon emissions from fossil fuels and producing zero or a very low amount of operational greenhouse gas emissions".

### EMD - ELECTRICITY MARKET DESIGN

**The reformed Electricity Market Design should help increase the use of the flexibility offered by heat pumps. It focuses on higher grid investments, non-fossil flexibility support options for Member States, and increased assessments of EU flexibility needs.**

### ETS2 - EUROPEAN EMISSION TRADING SYSTEM

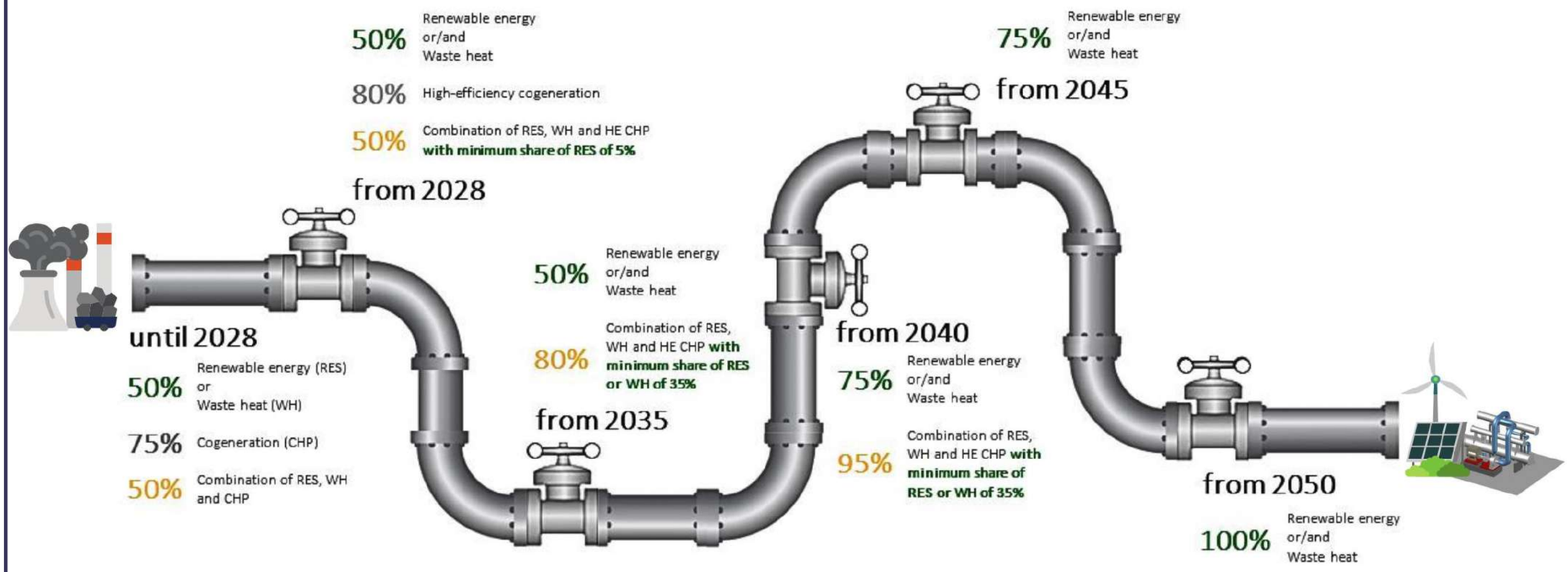
**Starting 2027, the expanded ETS2 includes buildings and transport in the 'polluter pays' principle. It will raise costs for fossil fuel heating emissions. Revenues will go to the Social Climate Fund, aiding vulnerable groups in green transitions, such as supporting renovations with heat pumps.**

# Energy Efficiency Directive: Decarbonisation pathway for DHC

## DHC networks: Getting to Net Zero

EUROHEAT & POWER

The Energy Efficiency Directive introduce a new definition of Efficient DHC networks.
It includes milestones to get to net zero by 2050, excluding the addition of new fossil fuel capacity from 2030 onwards.

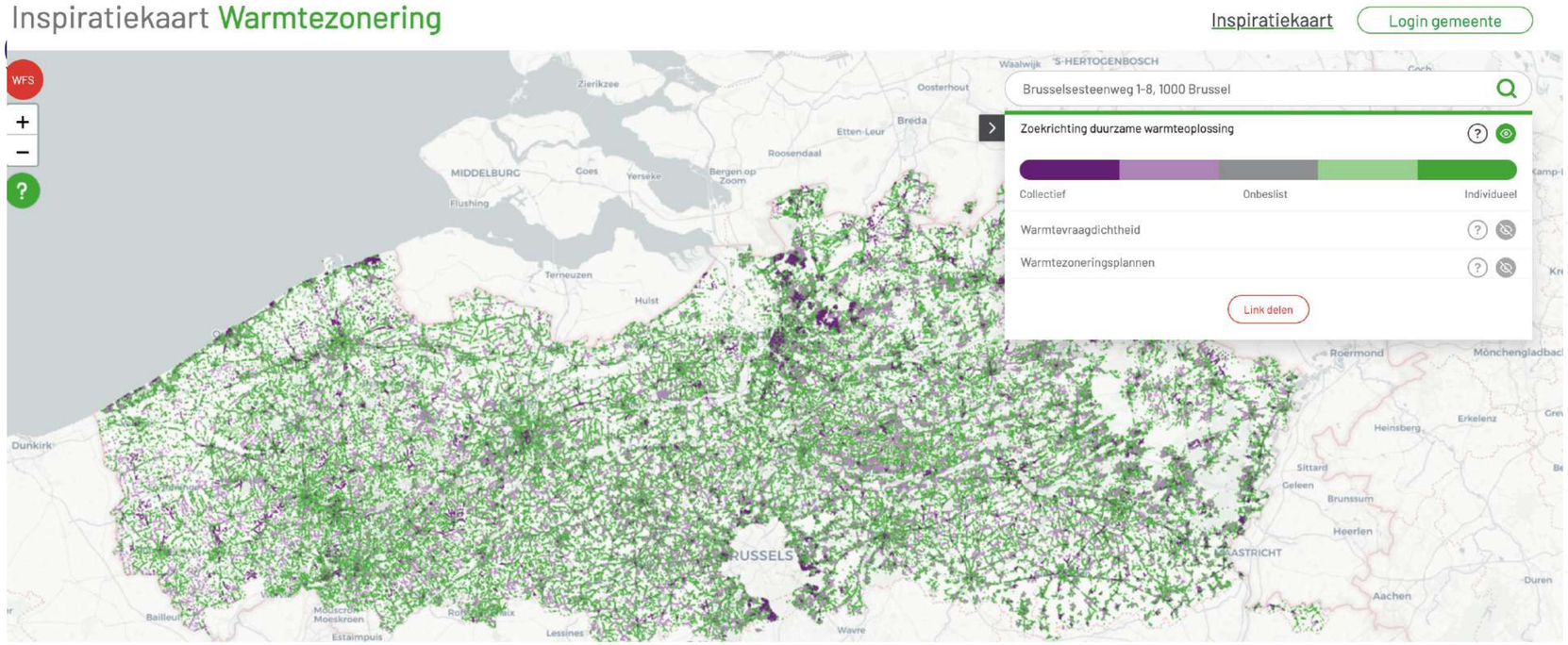





ehpa

# Energy Efficiency Directive: Local heating and cooling plans

- Mandatory as from > 45.000 inhabitants
- To provide mapping of potential for increasing energy efficiency (incl. via low-temperature district heating readiness, high-efficiency cogeneration, waste heat recovery, and renewable energy in heating and coolin
- To include strategy for the use of the identified efficiency potential




*Source: https://www.inspiratiekaartwarmtezonering.be/*

# EU Renewable energy directive EU 2023/2413

- Article 15 (3) Member States shall ensure … provisions for the integration and deployment of renewable energy … and for the use of unavoidable waste heat.
- Article 22a **Mainstreaming renewable energy in industry:** Member States shall endeavour to increase the share of renewable sources … in the industry sector by … at least 1.6 pp as an annual average (2021-2030)
- When electrification is considered to be a cost-effective option, those policies and measures shall promote the renewable-based electrification of industrial processes. … **Policies and measures shall create market conditions, for the availability of economically viable and technically feasible renewable energy alternatives to replace fossil fuels used for industrial heating … in which the temperature is below 200°C.**

# Barriers and solutions to wider use of large heat pumps

| Business case | Knowledge and trust | Complex integration | Infra-structure |
|---|---|---|---|

Subsidies

**Electricity price**

Access to finance

Flexible electricity tariffs

ETS I /II

Energy taxation

Information dissemination

Education & training

Projects

Commitment to electrification

Anticipatory investment

+ regulate waste heat recovery

# Example: District heating with sewage water heat pump in Budapest




| 250 $m^3/h$ | 1 690 kW | 1748 kW | 3.85 |
|---|---|---|---|
| Flow of Sewage | Heat Pump capacity (heating) | Heat Pump capacity (cooling) | Efficiency (COP) |

- 1,7 MW heating and cooling system for mayor's office and other buildings
- Wastewater heat recovery
- Wastewater of 15-20°C => water heating up to 63°C

https://thermowatt-global.com/project-items/ujpest-municipal-building/

# Do you want to join the heat pump community?

Check out how to become an EHPA member!

**www.ehpa.org/about-ehpa/join-us/**

jozefien.vanbecelaere@ehpa.org

@helloheatpumps

European Heat Pump Association

@EuropeanHeatPumpAssociation

**www.ehpa.org**

# Heating and cooling solutions of RACHP sector

Christina von Westernhagen, Johnson Controls

EPEE EEE Working Group Chair

March 20, 2024

EPEE

# Agenda for today

1. EPEE: members and contributions to heating and cooling
2. Focus on commercial heat pumps
3. Legislation as an enabling factor
4. District heating and cooling
5. Data Centers
6. Conclusion

# OUR MEMBERS

CORPORATE MEMBERS


ASSOCIATION MEMBERS


EPEE's membership is comprised of 46 member companies and national associations across Europe realising a turnover of over 30 billion Euros and employing more than 200,000 people in Europe.

EPEE

# OUR PRODUCTS

**Air-Conditioners**

**Heat Pumps**

**Refrigeration**

From less than 1 kW to a couple hundred kW

Including different technologies, such as “split” types and “self-contained” types

EPEE

# EPEE represents the full product range of refrigeration, AC and heat pump equipment…
# … using a diversity of refrigerants – HFCs, HFOs and natural refrigerants

Residential Heat Pumps, e.g. hydronic

Air/Air Heat Pumps for residential and commercial use

Large AC and heat pumps (chillers, VRFs, rooftops, …)

Commercial Refrigeration

Industrial Refrigeration

Transport refrigeration

District Heating and Cooling

# Our products come in many different forms and sizes to support heating and cooling …

Our products are used for comfort cooling/heating, they are used in all types of applications from residential, commercial, industrial
And have a capacity  from less than 1 kW up to several megawatts !

Single and multi-split systems

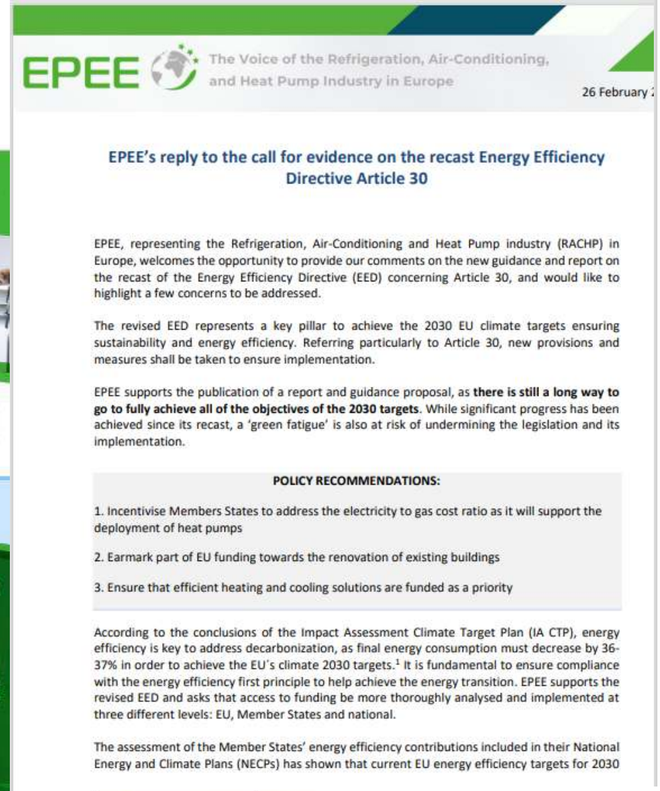
Monobloc air to water heat pump

Ground source heat pump

Rooftop unit

Chiller

# We support the EU GREEN DEAL …
# and our products help to achieve the EU climate target

EPEE The Voice of the Refrigeration, Air-Conditioning, and Heat Pump Industry in Europe

26 February

**EPEE's reply to the call for evidence on the recast Energy Efficiency Directive Article 30**

EPEE, representing the Refrigeration, Air-Conditioning and Heat Pump industry (RACHP) in Europe, welcomes the opportunity to provide our comments on the new guidance and report on the recast of the Energy Efficiency Directive (EED) concerning Article 30, and would like to highlight a few concerns to be addressed.

The revised EED represents a key pillar to achieve the 2030 EU climate targets ensuring sustainability and energy efficiency. Referring particularly to Article 30, new provisions and measures shall be taken to ensure implementation.

EPEE supports the publication of a report and guidance proposal, as **there is still a long way to go to fully achieve all of the objectives of the 2030 targets**. While significant progress has been achieved since its recast, a 'green fatigue' is also at risk of undermining the legislation and its implementation.

**POLICY RECOMMENDATIONS:**

1. Incentivise Members States to address the electricity to gas cost ratio as it will support the deployment of heat pumps

2. Earmark part of EU funding towards the renovation of existing buildings

3. Ensure that efficient heating and cooling solutions are funded as a priority

According to the conclusions of the Impact Assessment Climate Target Plan (IA CTP), energy efficiency is key to address decarbonization, as final energy consumption must decrease by 36-37% in order to achieve the EU´s climate 2030 targets.[1] It is fundamental to ensure compliance with the energy efficiency first principle to help achieve the energy transition. EPEE supports the revised EED and asks that access to funding be more thoroughly analysed and implemented at three different levels: EU, Member States and national.

The assessment of the Member States' energy efficiency contributions included in their National Energy and Climate Plans (NECPs) has shown that current EU energy efficiency targets for 2030

[1] Impact Assessment Report on energy efficiency

1

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THE VOICE OF THE REFRIGERATION, AIR-CONDITIONING AND HEAT-PUMP INDUSTRY IN EUROPE

January 2024

**EPEE's reply to the EED draft delegated act on Data Centers**

EPEE, representing the Refrigeration, Air-Conditioning and Heat Pump Industry (RACHP) in Europe, welcomes the provisions on data centre efficiency and sustainability included in the European Commission's proposal for a revised Energy Efficiency Directive (EED).

The number and size of data centres are expected to grow steadily due to the constant digitalization of more and more aspects of daily life. The high computational capacity of data centres translates into high quantities of energy used. In Europe alone, data centres are projected to generate 3.2% of the total electricity demand in the EU by 2030[1]. In addition, the role of data computing technologies as contributors to the green transition will require ever larger volumes of data to be stored and processed, e.g. in the Green Deal Data Space, the Digital Product Passport, and to support the proliferation of the Internet of Things/connected devices/products.

EPEE proposes that the delegated act **should prioritize and facilitate the integration of local heat sources**, particularly **waste heat from data centers**, into heating and cooling plans. This incorporation is essential for maximizing the utilization of available heat resources within the community. Municipalities should be enabled to assess the feasibility and potential benefits of integrating waste heat from data centers into their local heating plans, consequently contributing to enhanced energy efficiency and sustainable heat management.

Additionally, we emphasize the significance of developing comprehensive community energy master plans for large-scale systems, encompassing the mapping of network plans that prioritize proximity to existing optimal heat sources, including data centers. Such initiatives not only promote resource efficiency but also support the transition towards more sustainable and environmentally conscious practices.

Moreover, our association supports the adoption of local heating and cooling plans that prioritize the utilization of available free heat sources. This strategy aims to promote sustainable and energy-efficient systems within local communities by encouraging the incorporation of renewable energy sources and innovative technologies. Municipalities can effectively allocate resources and subsidies to facilitate the integration of sustainable energy infrastructure, further contributing to environmental and energy conservation initiatives within the locality.

In relation to this, it is crucial that the delegated act incorporates the Carbon Usage Effectiveness (CUE) as a vital indicator for evaluating the sustainability of the data center "industry". We firmly believe that this indicator offers a more encompassing view of the environmental impact of data center operations, surpassing traditional metrics like Power Usage Effectiveness (PUE). Inclusion

[1] Environment Agency Austria & Borderstep Institute (2020): Energy-efficient Cloud Computing Technologies and Policies for an Eco-friendly Cloud Market

1

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# What is driving the carbon reduction policy in Europe and the EU Green Deal

EU Green deal
Net Zero by 2050
Renovation Wave
Climate law
Fit for 55 package
Energy Performance of Buildings Directive

## Buildings account for:

**40%** of energy consumed

**36%** of energy-related greenhouse gas emissions

**75%** of EU buildings are not energy efficient

**85-95%** of EU buildings are expected to still be standing in 2050

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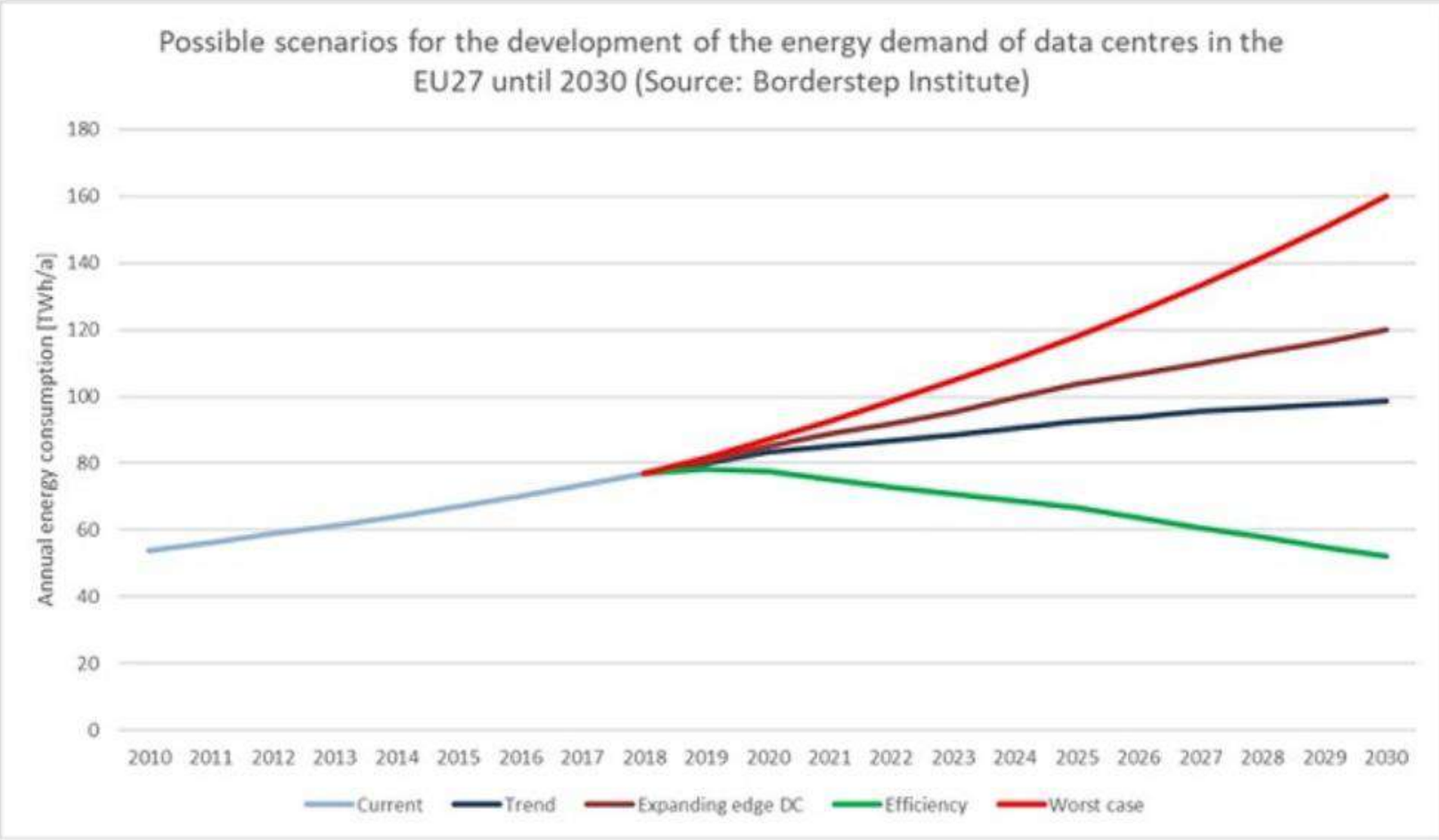
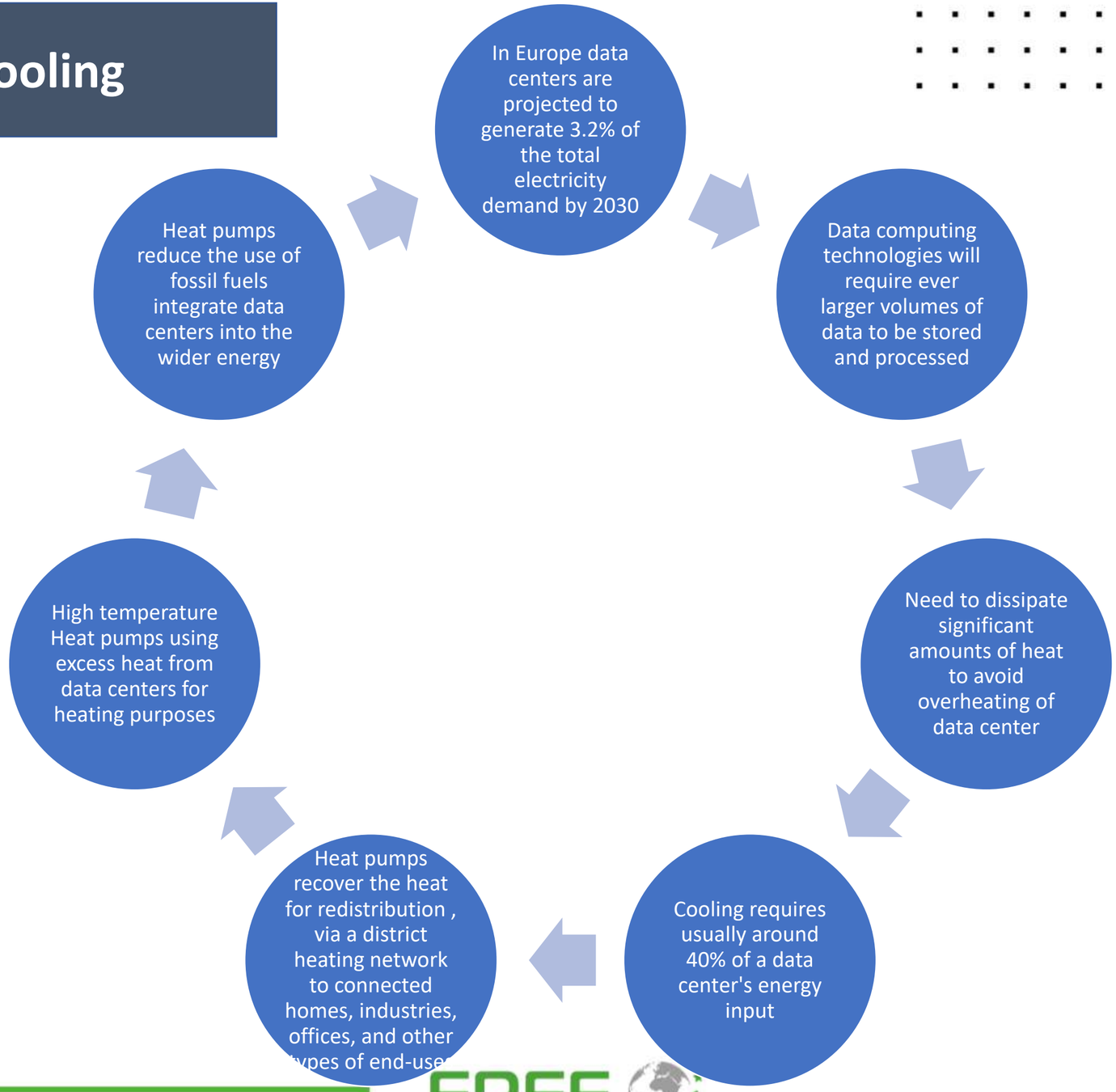
# Possible scenarios for the development of the energy demand of  data centers in the EU 27 until 2030



# Data Center Cooling

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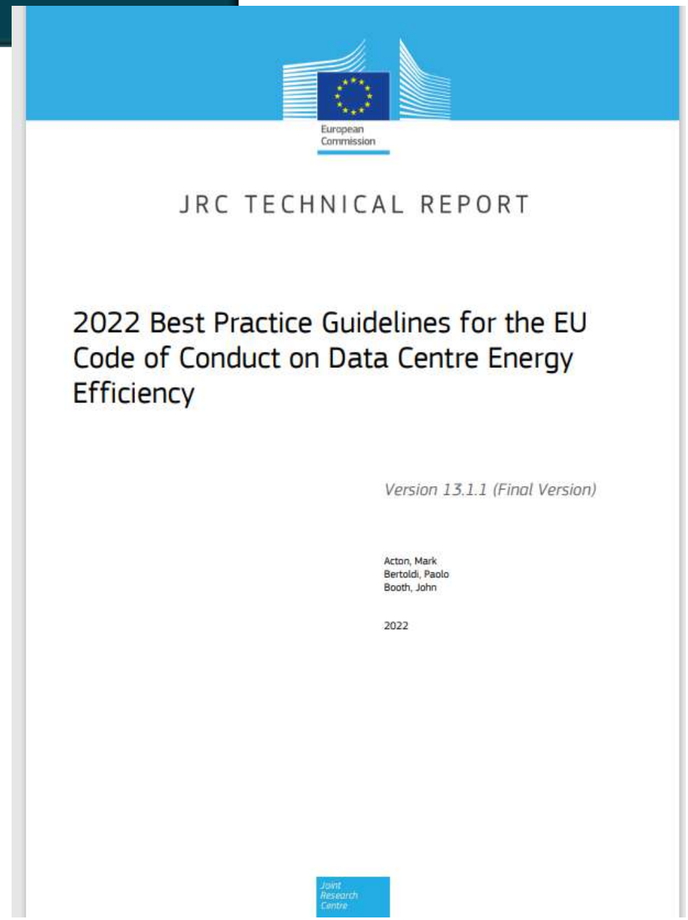
# Existing EU laws to phase down carbon emissions of data centers

Existing instruments include:

- the Ecodesign Regulation on servers and data storage products
- the EU Code of Conduct on Data Centre Energy Efficiency
- the EU Green Public Procurement criteria for data centres, server rooms and cloud services



# EU law to advance carbon reduction of data centers

The Commission Proposal for a Directive on energy efficiency (recast) introducing new elements to improve the energy efficiency and sustainability monitoring of data centers;

The Taxonomy Regulation and its Delegated Act adopted in July 2021, which sets the framework for investments to be qualified as sustainable;

Its funding programmes: Horizon Europe, Connecting Europe Facility 2, Digital Europe programme, InvestEU and the Recovery and Resilience Facility will support the deployment of an innovative, green and secure cloud.

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## Self Regulatory Initiative

Data centres and server rooms in Europe shall meet a high standard for energy efficiency, which will be demonstrated through aggressive power use effectiveness (PUE) targets.

**Data centers are an integral part of the sustainable future of Europe, data center operators and trade associations agree to take the following actions to make data centers climate neutral by 2030.**

By January 1, 2025 new data centers operating at full capacity in cool climates will meet an annual PUE target of 1.3, and 1.4 for new data centers operating at full capacity in warm climates.

Existing data centers will achieve these same targets by January 1, 2030.

These targets apply to all data centers larger than 50KW of maximum IT power demand.

In recognition of the European Commission’s interest in creating a new efficiency metric, trade associations will work with the appropriate agencies or organizations toward the creation of a new data center efficiency metric. Once defined, trade associations will consider setting a 2030 goal based on this metric.

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# Now the delegated act on data centers …

- We want sustainable heat management.
- We call for prioritization of resource efficiency, renewable energy sources and innovative technologies.
- We call for a transition to more sustainable and environmentally conscious practices.
- We want to maximize the utilization of available heat resources within the community

- ✓The delegated act  needs to prioritize and facilitate the integration of local heat sources, particularly waste heat from data centers, into heating and cooling plans.
- ✓Comprehensive community energy master plans for large-scale systems needs to be developed
- ✓Network plans need to map and prioritize proximity to existing optimal heat sources, including data centers to facilitate the integration of sustainable energy infrastructure

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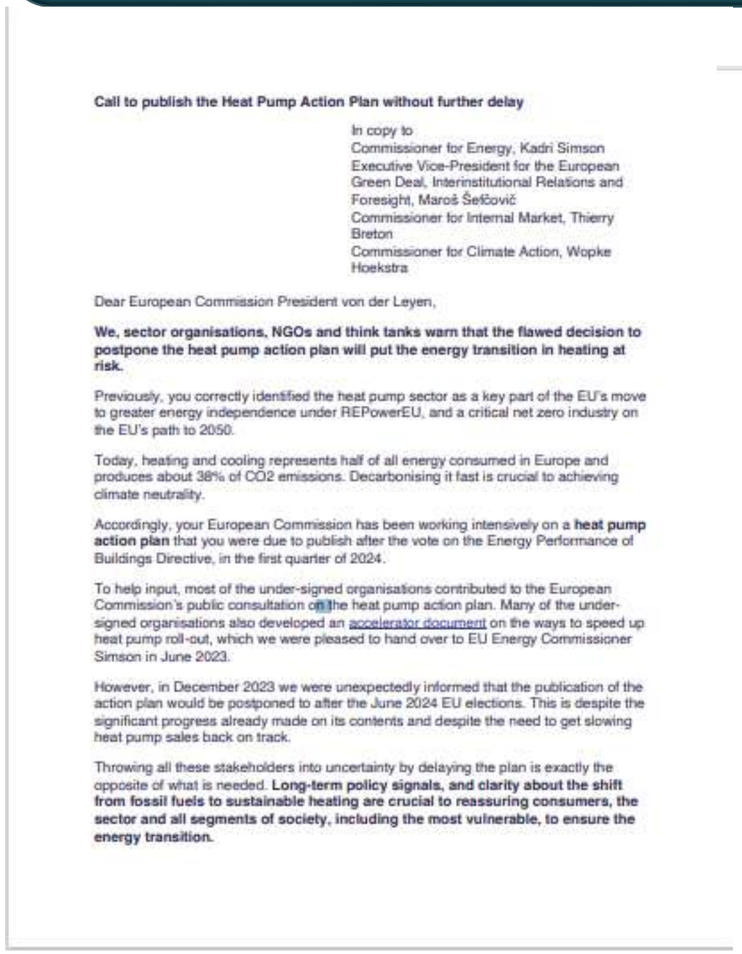
# More needs to be done



**Call to publish the Heat Pump Action Plan without further delay**

In copy to
Commissioner for Energy, Kadri Simson
Executive Vice-President for the European Green Deal, Interinstitutional Relations and Foresight, Maroš Šefčovič
Commissioner for Internal Market, Thierry Breton
Commissioner for Climate Action, Wopke Hoekstra

Dear European Commission President von der Leyen,

**We, sector organisations, NGOs and think tanks warn that the flawed decision to postpone the heat pump action plan will put the energy transition in heating at risk.**

Previously, you correctly identified the heat pump sector as a key part of the EU's move to greater energy independence under REPowerEU, and a critical net zero industry on the EU's path to 2050.

Today, heating and cooling represents half of all energy consumed in Europe and produces about 38% of $CO_2$ emissions. Decarbonising it fast is crucial to achieving climate neutrality.

Accordingly, your European Commission has been working intensively on a **heat pump action plan** that you were due to publish after the vote on the Energy Performance of Buildings Directive, in the first quarter of 2024.

To help input, most of the under-signed organisations contributed to the European Commission's public consultation on the heat pump action plan. Many of the under-signed organisations also developed an accelerator document on the ways to speed up heat pump roll-out, which we were pleased to hand over to EU Energy Commissioner Simson in June 2023.

However, in December 2023 we were unexpectedly informed that the publication of the action plan would be postponed to after the June 2024 EU elections. This is despite the significant progress already made on its contents and despite the need to get slowing heat pump sales back on track.

Throwing all these stakeholders into uncertainty by delaying the plan is exactly the opposite of what is needed. **Long-term policy signals, and clarity about the shift from fossil fuels to sustainable heating are crucial to reassuring consumers, the sector and all segments of society, including the most vulnerable, to ensure the energy transition.**

**With the political balance of Europe on the verge of potentially significant change, we call upon the European Commission to choose determination and progress towards its own Green Deal over fear. We urge you not to tarnish your political legacy by undermining previous efforts towards the 2030 and 2050 climate and energy targets.**

**We urge the European Commission to publish the heat pump action plan without further delay so that we reach an energy independent, net zero Europe on time.**

We would welcome the opportunity to meet with you for further discussions.

Yours sincerely,

CAN · CEE Bankwatch Network · CLEAN HEAT EUROPE
ecos · EEB
EGEC · ehpa · Euroheat & Power
ENERGY CITIES · EPEE · EREF
eurelectric · European Copper Institute · EuropeOn
GCP EUROPE · NATUUR & MILIEU · smartEn
SolarPower Europe

We need the Heat Pump Action Plan

EU “Green Deal” vision for tackling climate change remains in place

“The competitiveness risk to Europe... that won’t be reversed by us going weak on climate,” said Irish climate minister Eamon Ryan

EPEE

# Thank you for your attention!

To find out more about EPEE:

epeeglobal.org

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