

FROM RECOVERY TO DECARBONISATION

DECARBONISING HEATING TO ACHIEVE CLIMATE NEUTRALITY



EEB

European
Environmental
Bureau

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THE HEATING PROBLEM

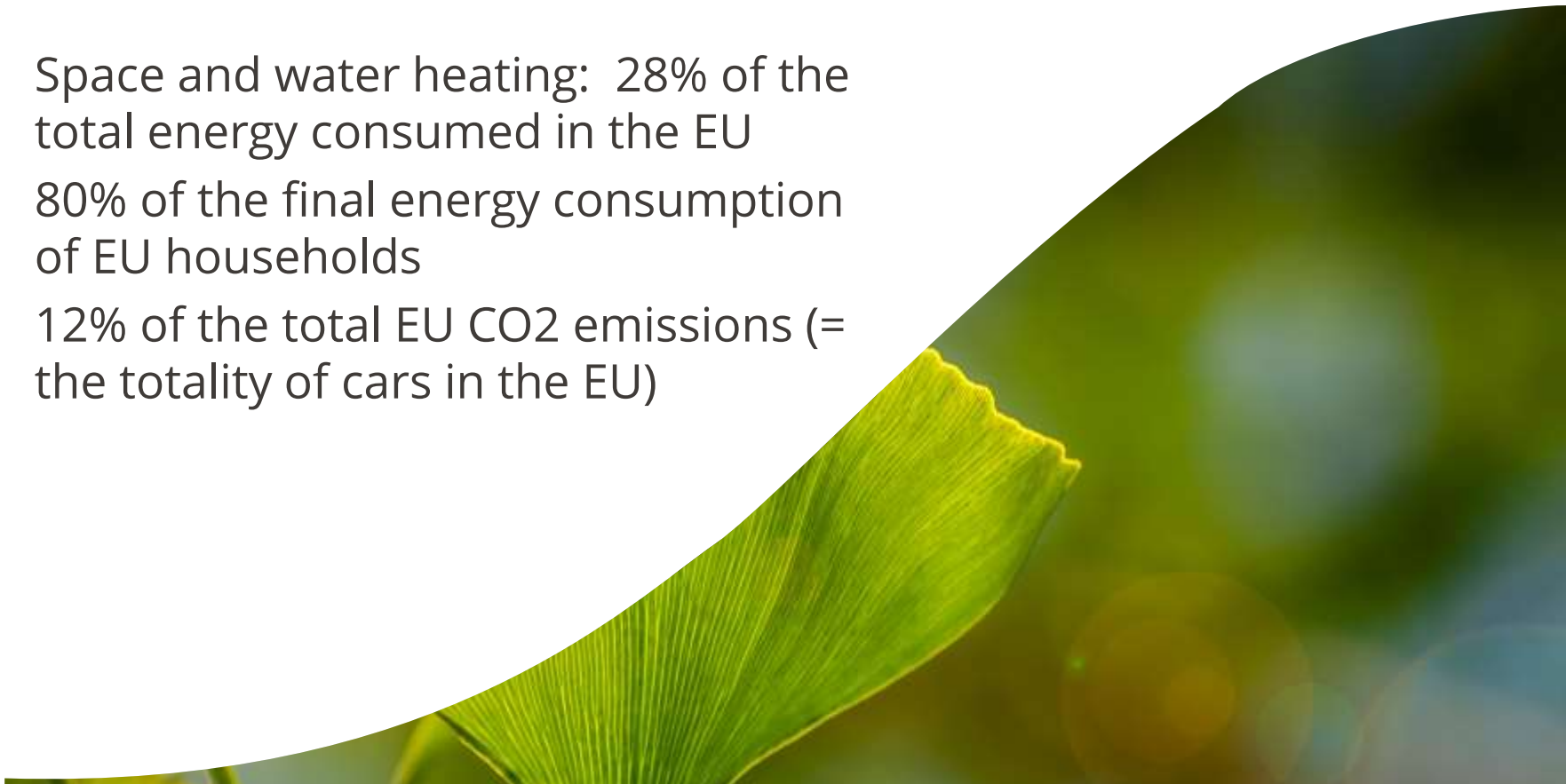
The elephant in the room

- With 80% of Europe's heating being generated by fossil fuels – mostly gas – climate action in this area will require additional efforts to achieve the -55% target
- No fossil fuels phase-out target or pathway is there
- An ambitious renovation wave must be coupled with a plan to gradually phase out the installation of fossil heating & cooling technologies
- The EU Hydrogen strategy still promotes the use of decarbonised gas in the building sector, when we know its availability is still limited and it should therefore be used to decarbonise other sectors.

HEATING IS KEY

This is the priority to decarbonise the economy

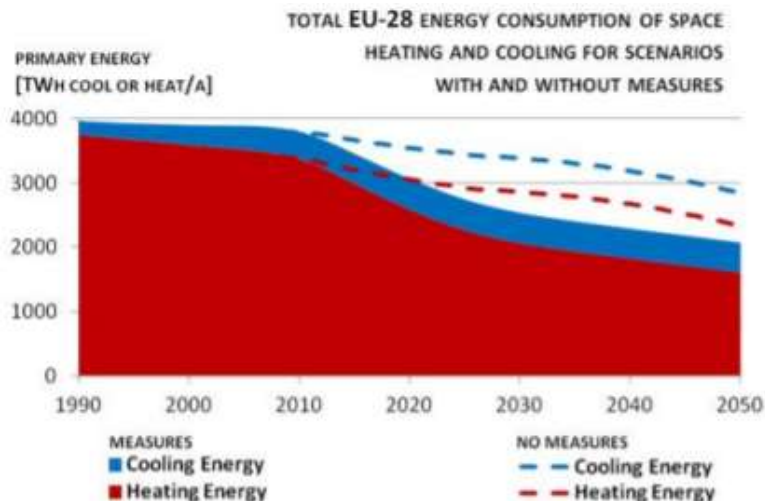
- Space and water heating: 28% of the total energy consumed in the EU
- 80% of the final energy consumption of EU households
- 12% of the total EU CO₂ emissions (= the totality of cars in the EU)



HEATING IN FIGURES

70% of the EU building heat load (2000 TWh/y) is provided by space heating products covered by Ecodesign and Energy Labelling

Ecodesign measures allowed to save **35%** of the total primary energy savings of regulated products



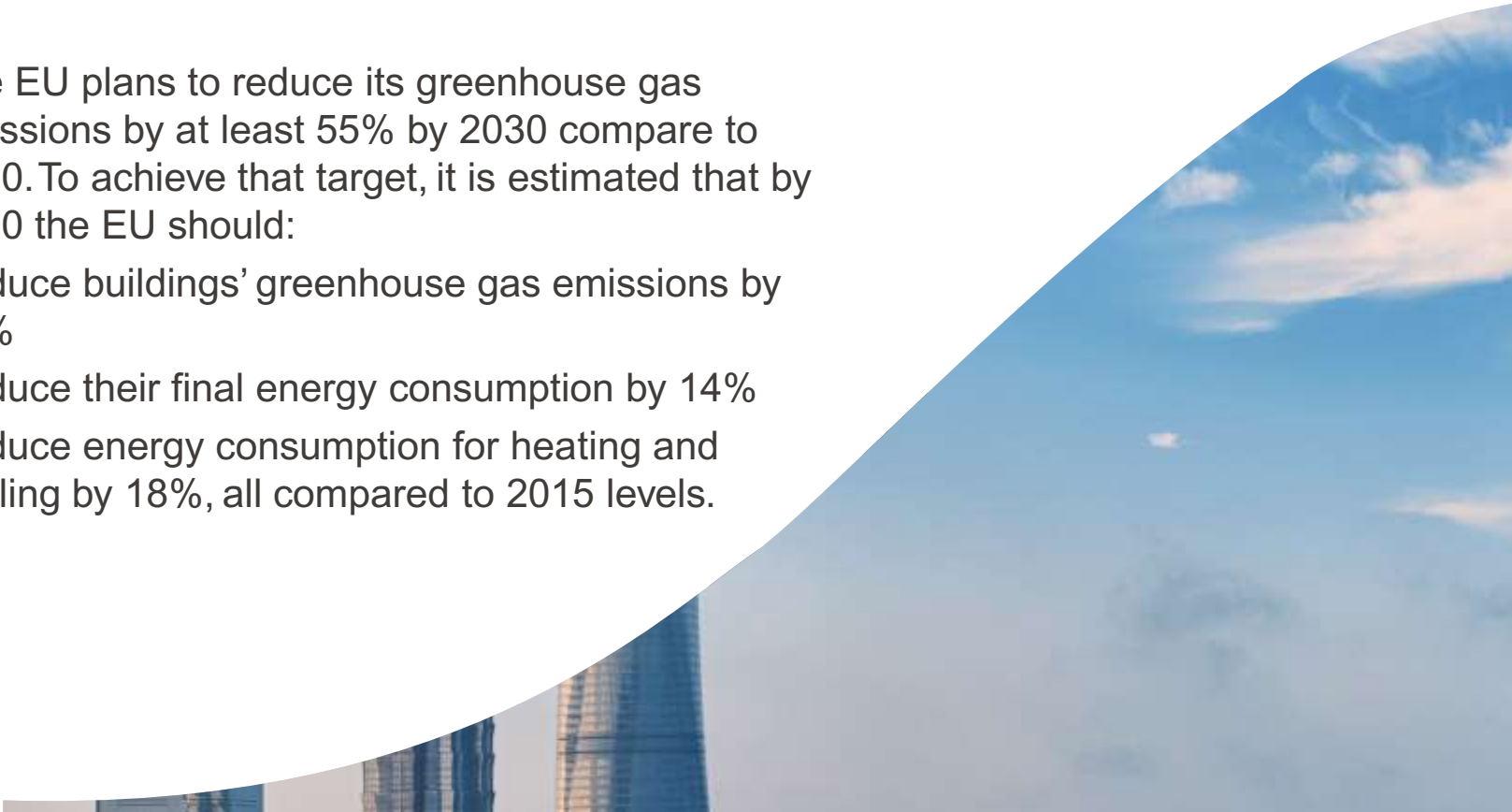
We can achieve more savings !

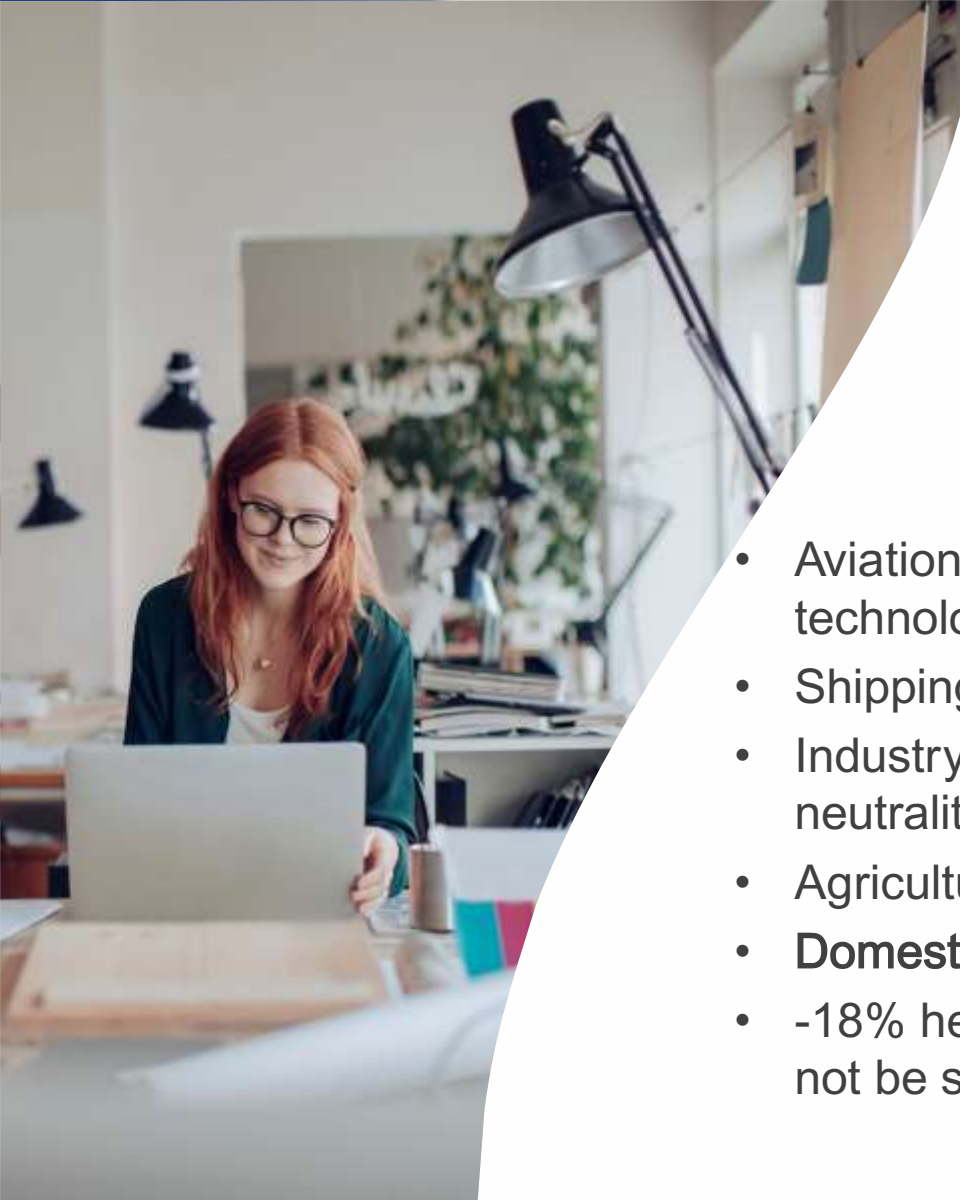
- Central heating functions at **85%** through **direct use of fossil fuels**
- Gas boilers represent **58%** of the installed stock
- **60%** of the stock is **old and inefficient** (C class and below)

TARGETS AHEAD

On heating consumption

- The EU plans to reduce its greenhouse gas emissions by at least 55% by 2030 compare to 1990. To achieve that target, it is estimated that by 2030 the EU should:
- Reduce buildings' greenhouse gas emissions by 60%
- Reduce their final energy consumption by 14%
- Reduce energy consumption for heating and cooling by 18%, all compared to 2015 levels.





WE NEED AMBITION

To achieve -55%

- Aviation is 10 years away from breakthrough technology uptake
- Shipping is still very problematic
- Industry not even formally compelled to climate neutrality and has 30-60yrs investment cycles.
- Agriculture emissions not addressed properly
- **Domestic heating is the low-hanging fruit**
- -18% heating energy consumption by 2030 might not be sufficient

NO REGRET OPTION

We need to go big, and we need to do it quickly

The first no-regret action to undertake at EU level is **adopt a pathway to phase-out fossil fuels in H&C**, where technology is already there

- This will achieve massive CO2 savings quickly
- This will decrease dramatically fuels imports
- This will cut sharply bills for citizens and public authorities
- This will boost renovations and create jobs
- This will accelerate R&I



HEATING - REGULATIONS

Local space heaters (ENER Lot 20)

Ecodesign

Reg 2015/1188: local space heaters (since 1st January 2018)
Review by 1st January 2019

Reg 2015/1185: solid fuel local space heaters
 3rd party certification: by 22nd August 2018.
Review: by 1st January 2024



Energy Labelling:

Reg 2015/1186: local space heaters (excluding electric heaters)
Review by 1st January 2024
 Revision with a view to rescale A to G label to be adopted **by 2nd August 2023**.

Proposal to merge energy labels (March 2019)

Air conditioning (ENER Lot 10)

Energy Labelling:

Reg 626/2011: air conditioners
 Covers: electric mains-operated air conditioners with a rated capacity of ≤ 12 kW for cooling, or heating, if the product has no cooling function. Comfort fans ≤ 125W
CF in June/July 2019 → adoption expected in 2020.
Energy label to be rescaled during this review.

Ecodesign

Reg 2016/2281: air heating products, cooling products, high temperature process chillers and fan coil units
 Covers: warm air heaters, comfort chillers, air-to-air air conditioners > 12kW, water/brine air to air conditioners
 Fan coil units, air-to-air heat pumps > 12kW, water/brine air heat pumps, high temperature process chillers
Review: by 1 January 2023

Space and water heaters (ENER Lot 1 & 2)

Ecodesign

Reg 813/2013: space heaters and combination heaters
Review ongoing- preparatory study finalised: May 2019

Reg 814/2013: water heaters and hot water storage tanks
Review ongoing- preparatory study finalised: May 2019

Energy Labelling:

Reg 811/2013: space heaters, combination heaters, packages of space heater, temperature control and solar device and packages of combination heater, temperature control and solar device.
Review ongoing- preparatory study finalised: May 2019

Reg 812/2013: water heaters, hot water storage tanks and packages of water heater and solar device.
Review ongoing- preparatory study finalised: May 2019



Rescaling

Derogation in [EL Framework Reg](#) (Recital 17) – distinction between fossil fuel technologies (A) and technologies using renewable energies (A+, A++, A+++). Rescaling later because slower move to renewable technologies.
Review by 2 Aug 2025
Adoption of rescaled labels: 2 Aug 2026 'where appropriate'/ Final deadline to adopt rescaled labels: 2 August 2030



Solid fuel boilers (ENER Lot 15)

Ecodesign

Reg 2015/1189: solid fuel boilers

Energy Labelling

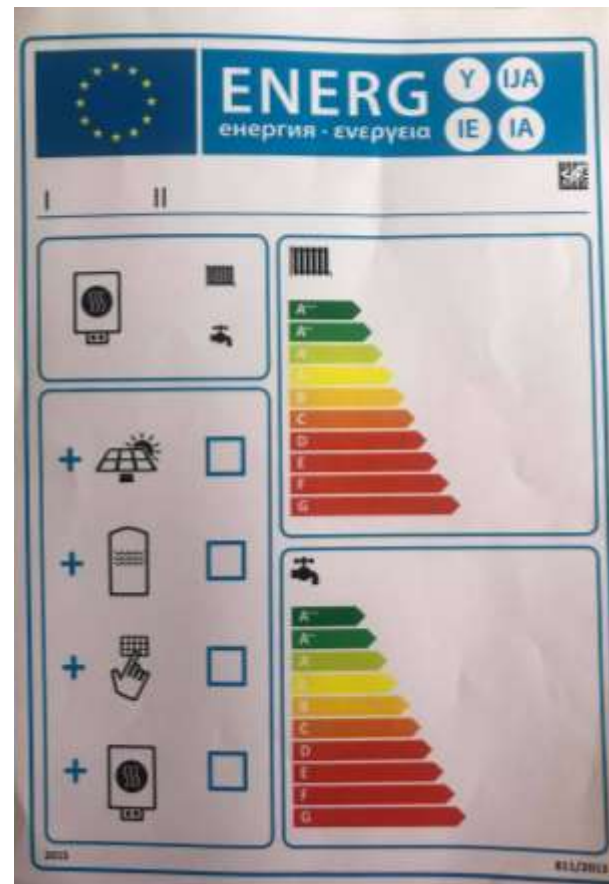
Reg 2015/1187: solid fuel boilers

Review for both -1st January 2022 (no derogation in ELFR)
 Study on introduction of [3rd Party certification](#) – by 26 September 2018

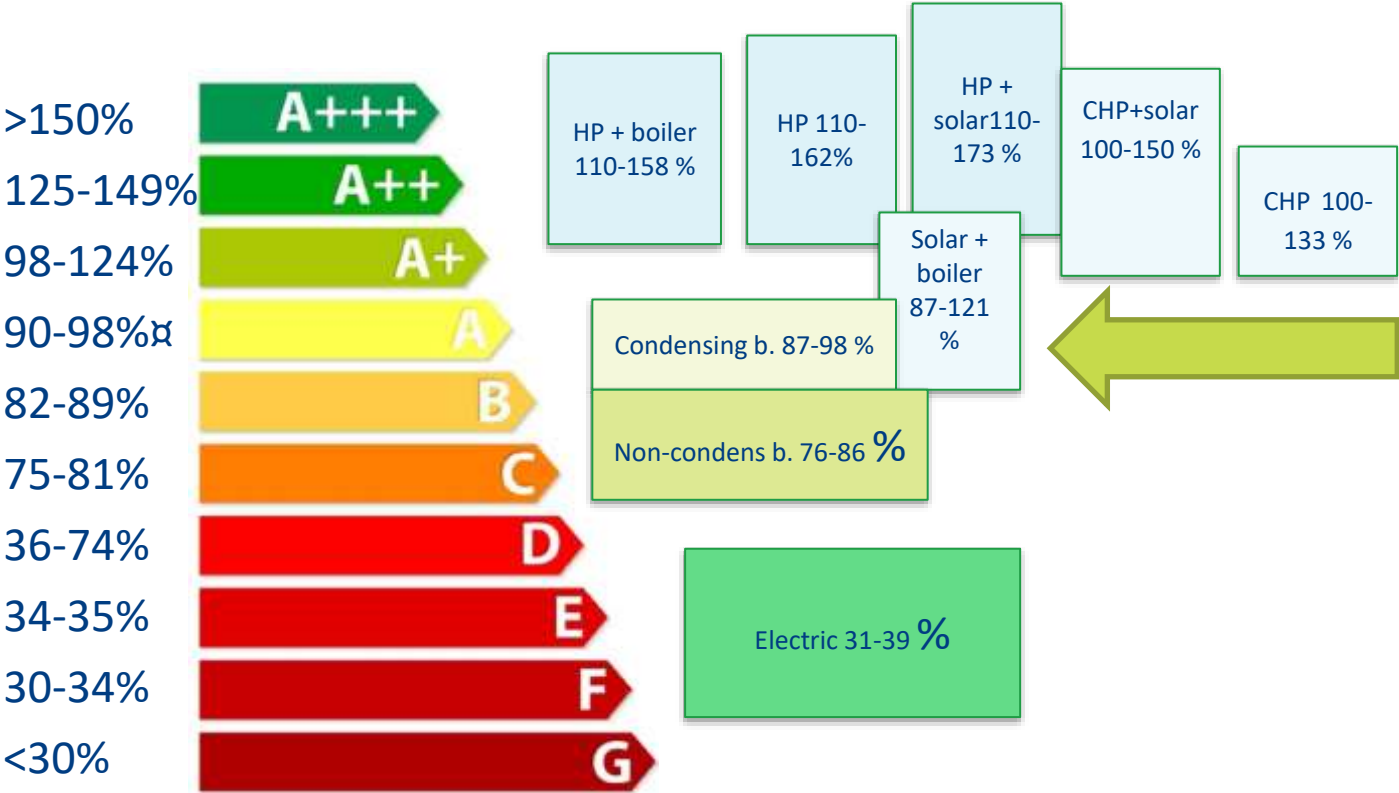


ISSUES WITH THE EXISTING LABEL

1. Unfair advantage for fossil fuel fired appliances (condensing gas boilers labelled A or A+)
2. No clear advantage for renewable technologies (e.g solar thermal)
3. Incompatible with the climate and emission reduction targets



Present boilers label supports gas boilers with A



HEAT FOR ALL

We need inclusive change

*Every European citizen
deserves to be moving from
the problem to the solution
side of heating.*

We need policies for all.



DECARBONISATION PATHWAYS

Following Netherland's example

There are several pathways to achieve decarbonisation in heating but all of them share some policy key measures

1. Focus on energy efficiency first
2. Promote renewable efficient technologies with subsidies (i.e. linking the subsidies to energy labels)
3. Phase-out fossil technologies from local/national building code permitting procedures*.
4. Create market conditions (skills, dissemination, availability) to make the change happen

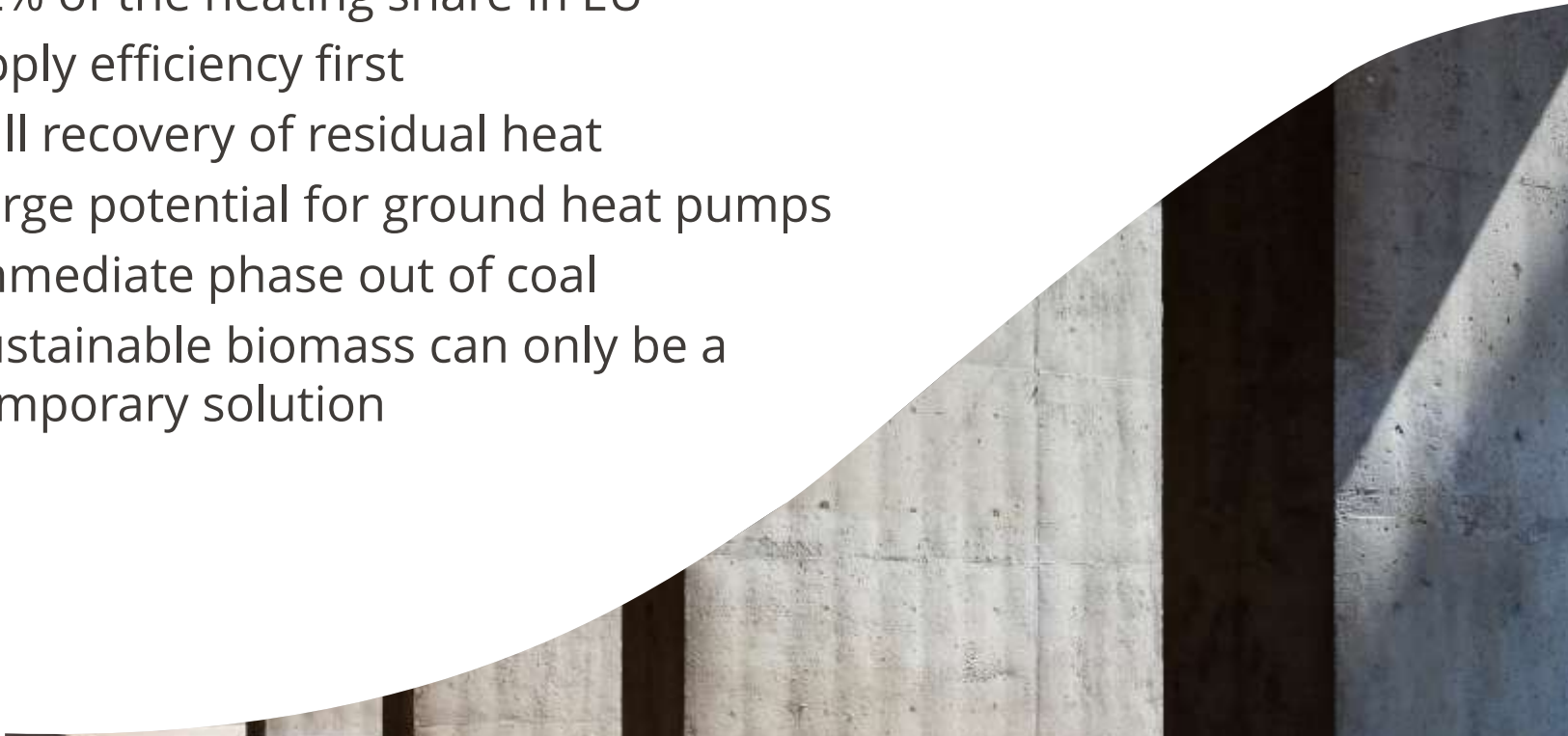
*ECOS will soon publish a report on this



REFURBISH DISTRICT HEATING

Immediate actions

- 12% of the heating share in EU
- Apply efficiency first
- Full recovery of residual heat
- Large potential for ground heat pumps
- Immediate phase out of coal
- Sustainable biomass can only be a temporary solution



CARBON FOOTPRINT OF HEATING

Table 1. Carbon footprint estimates for non-electric space and water heating.^{21,23-39}

Technology	Footprint range (gCO ₂ e/kWh)	Number of estimates
Oil boilers	310-550	3
Gas boilers	210-380	4
Gas micro-CHP	220-300 ²²	4
GAHP	150-200 ⁴⁰	2
Bio-sourced gases	20-100 ⁴¹	9
Biomass boilers	5-200 (most below 100) ⁴²	1
Geothermal	10	
Solar thermal	10-35	

Table 2. Carbon footprint estimates for electric heating technologies under the three electricity supply scenarios outlined in Box 2.^{35,49-58}

Technology	Electricity footprint estimate	Footprint range (gCO ₂ e/kWh)	Number of estimates
Electric heaters	Current (370)	-370	Personal Communication ⁵⁹
	Reduced (250)	-250	
	Low (100)	-100	
Ground source heat pumps	Current (370)	70-190	11
	Reduced (250)	50-125	
	Low (100)	20-50	
Air source heat pumps	Current (370)	90-250	11
	Reduced (250)	60-170	
	Low (100)	30-70	

MAIN CONCEPT

We need to act now

Consumers tend to change their heating system only when it breaks. On average every 20 to 25yrs

The last fossil-base heating tech must be sold in 2025 to achieve climate neutrality in this sector by 2045

CAN WE TRUST MEMBER STATES ?

Immediate actions

- Interesting change of attitude by some MS
- But most member states are still on conservative position because
- They do not want to increase energy poverty or
- They defend the Gas market players



Fossil heating incentives map

IS YOUR COUNTRY READY FOR THE CLEAN HEATING TRANSITION?

The heating sector is responsible for almost half of the EU's annual energy consumption and a third of its CO2 emissions.

Click on the category and map below to see how your country is doing

Select a country

Select a category



Subsidies to heat pumps



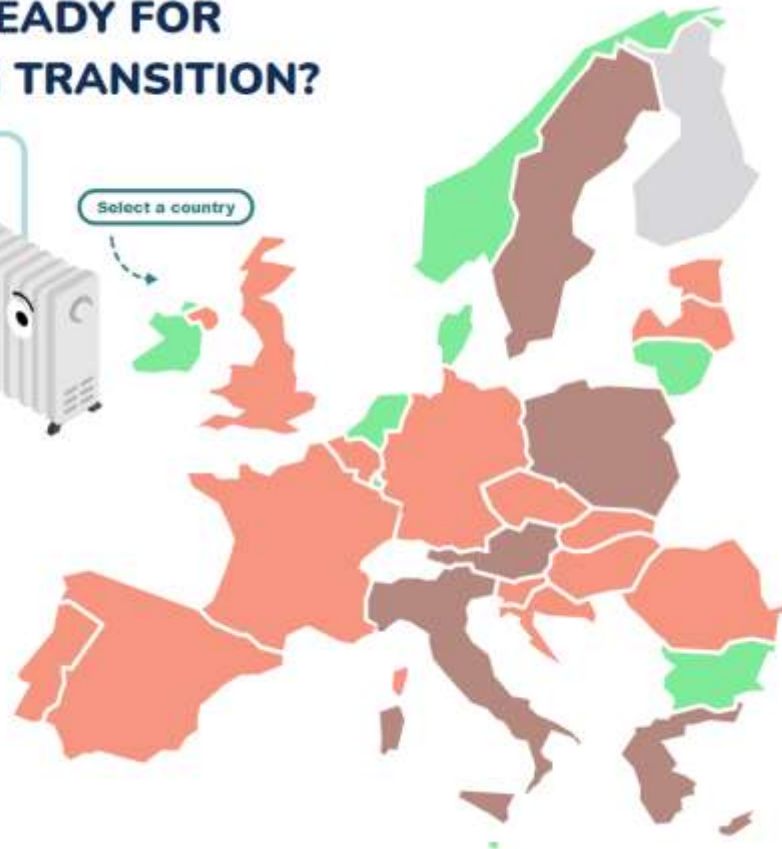
Subsidies to solar heating systems



Share of renewable energy used for heating and cooling



Subsidies to fossil fuel heating



Heat Pumps incentives map

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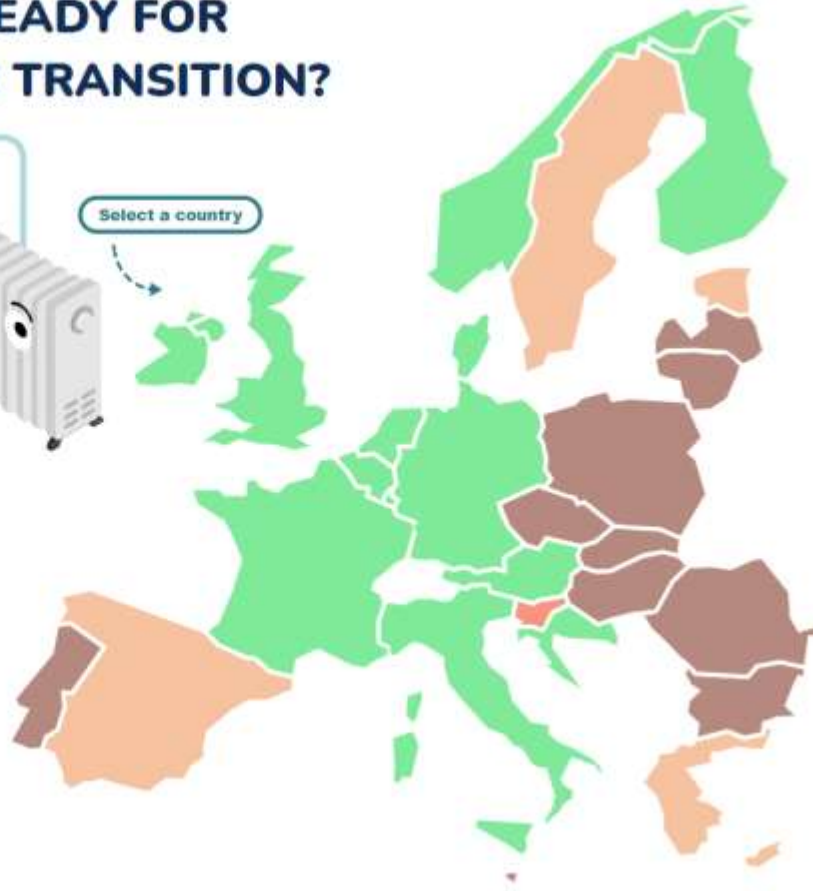
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Select a country

Select a category

-  Subsidies to heat pumps
-  Subsidies to solar heating systems
-  Share of renewable energy used for heating and cooling
-  Subsidies to fossil fuel heating



Solar thermal incentives map

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Select a country

Select a category



Subsidies to heat pumps



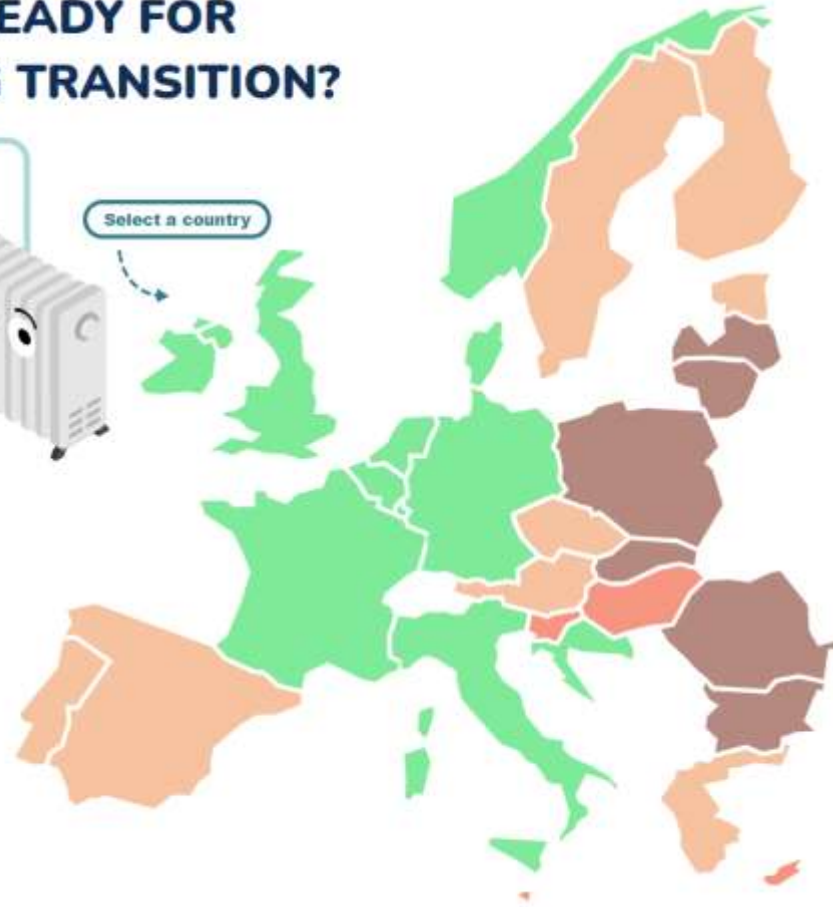
Subsidies to solar heating systems



Share of renewable energy used for heating and cooling



Subsidies to fossil fuel heating



Tab. 1: summary table of incentives (L= loans; T: tax reduction; S=subsidy; *only at local level)

Number	Country	Condensation heaters (natural gas, LPG, oil)	Microcogeneration	Hybrid Heat Pumps	Air/Air Heat Pumps	Air/Water or Water/Water Heat Pumps	Geothermal Heat Pumps	Biomass	Solar Thermal
1	Austria	S* L*			S	S	S	S	S
2	Belgium	ST	ST	ST	ST	ST	ST	ST	ST
3	Bulgaria	LS*	LS		LS	LS	LS	LST	LST
4	Croatia	S*		S	S	S	S	S	S
5	Cyprus	S	S		S	S	S	S	S
6	Czech Republic	S			S	S	S	S	S
7	Danmark					S	S		
8	Estonia	S			S	S	S	S	S
9	Finland								
10	France	LST		LST	LST	LST	LST	LST	LST
11	Germany	LS		LS	LS	LS	LS	LS	LS
12	Greece	LS	LS	LS	LS	LS	LS	LS	LST
13	Hungary				L	L	L		L
14	Ireland				S	S	S		S
15	Italy	ST	T	ST	ST	ST	ST	ST	ST
16	Latvia	L	L		L	L	L	L	L
17	Lithuania				S	S	S	S	
18	Luxemburg				LS	LS	LS	LS	LS
19	Malta				S	S	S		S
20	Netherland					S	S		S
21	Norway				S (by 31th dec)		S	S	S
21	Poland	ST			ST	ST	ST	ST	ST
22	Portugal	L			LS	LS	LS	LS	LS
23	Romania	S	S			S	S		S
24	Slovakia	S			S	S	S	S	S
25	Slovenia	LS	L		LS	LS	LS	LS	LS
26	Spain	S*			S	S	S	S	S
27	Sweden	T			T	T	T	T	T
28	United Kingdom	S		S	S	S	S	S	S

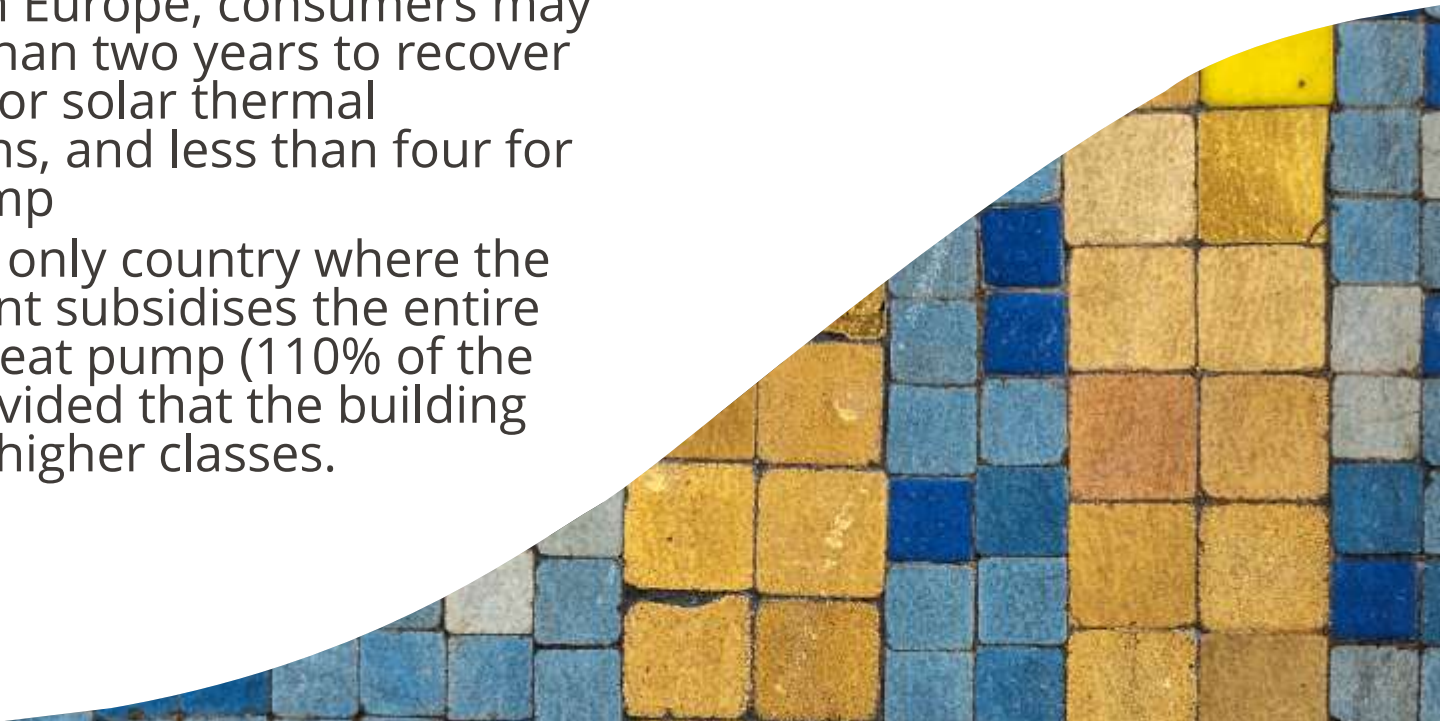
24 countries allocate direct grants to support the installation of heat pumps;
 5 prefer tax reduction schemes;
 9 give out loans.
 10 countries had more than one scheme in place

23 countries allocate direct grants to support the installation of solar thermal systems;
 7 prefer tax reduction schemes;
 9 give out loans.
 10 countries had more than one scheme in place.

***This table will be updated soon**

HIGHLIGHTS

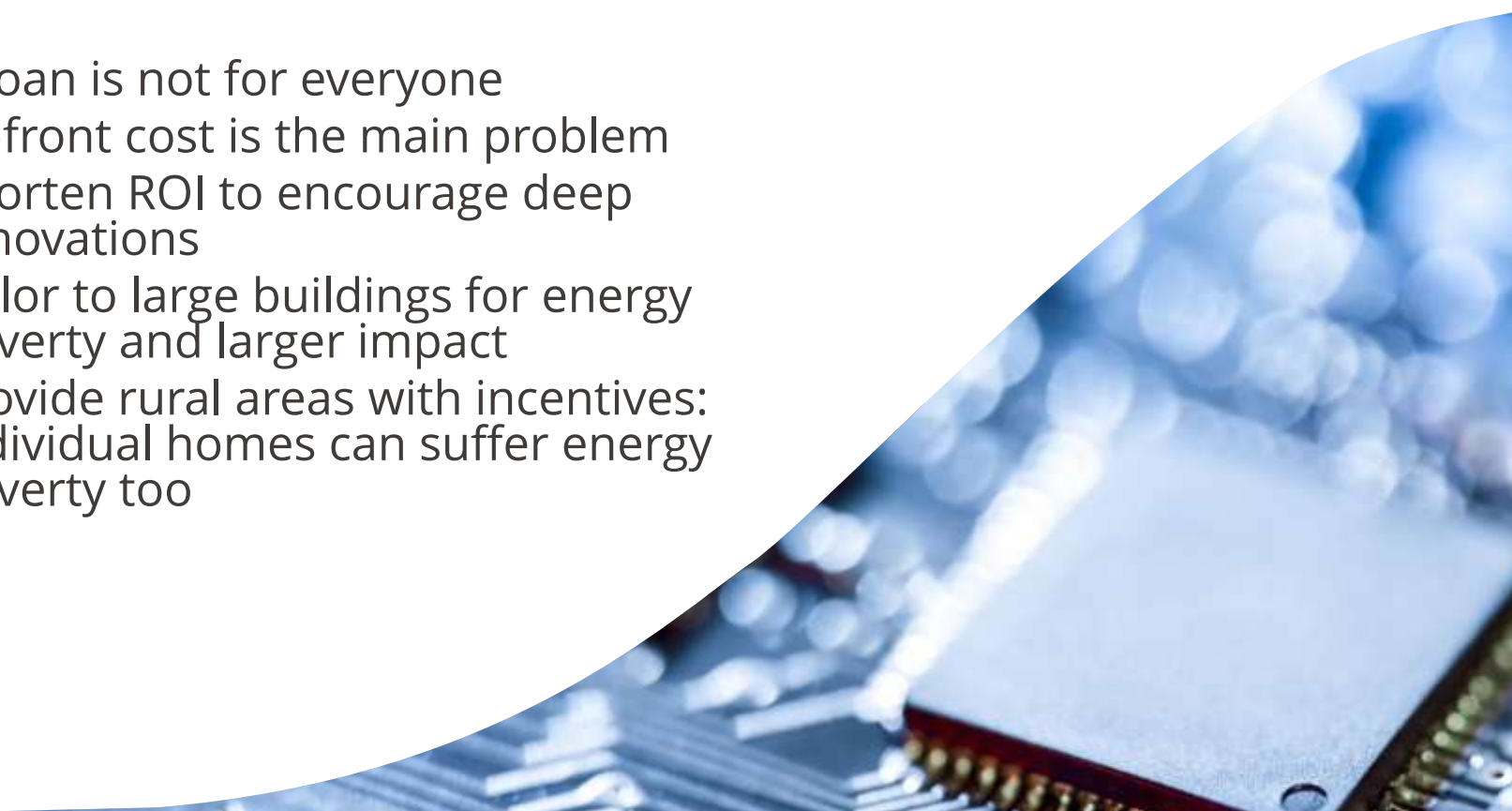
- A household in Eastern Europe may take eight to 15 years to offset the installation costs of a heat pump.
- In Western Europe, consumers may take less than two years to recover the costs for solar thermal installations, and less than four for a heat pump
- Italy is the only country where the government subsidises the entire cost of a heat pump (110% of the costs), provided that the building reaches 2 higher classes.



SUBSIDY TIPS

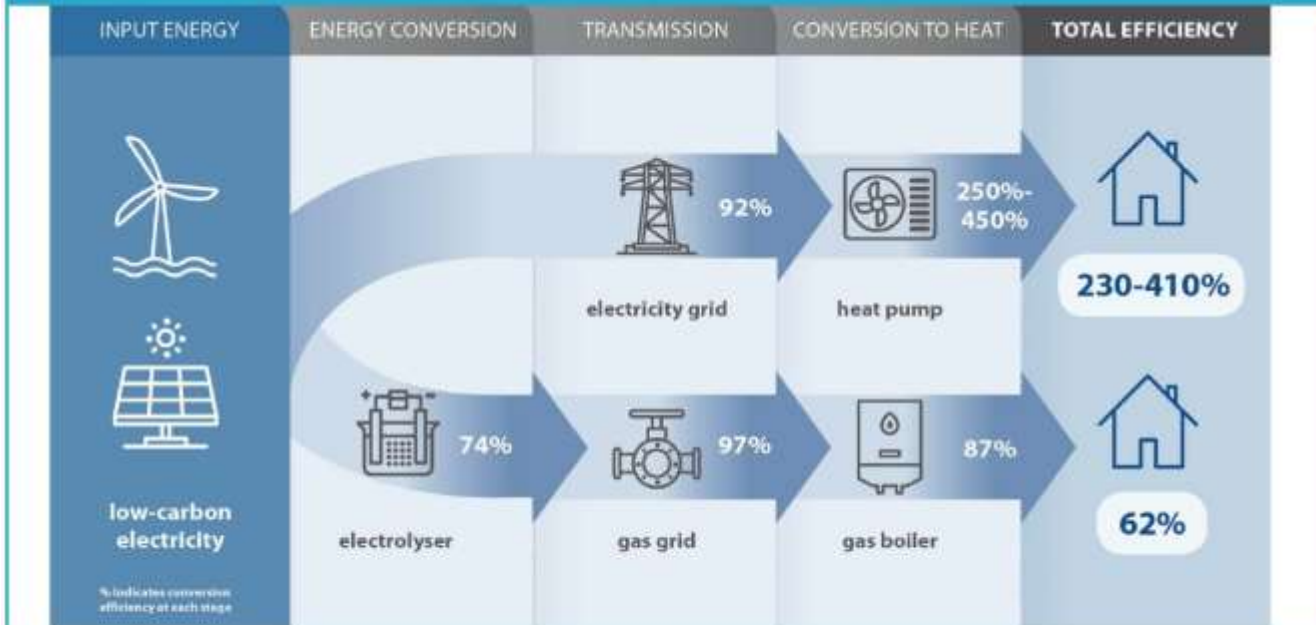
Different inclusive incentive schemes for all Europeans

- A loan is not for everyone
- Upfront cost is the main problem
- Shorten ROI to encourage deep renovations
- Tailor to large buildings for energy poverty and larger impact
- Provide rural areas with incentives: individual homes can suffer energy poverty too



FOCUSED USE OF GREEN H2

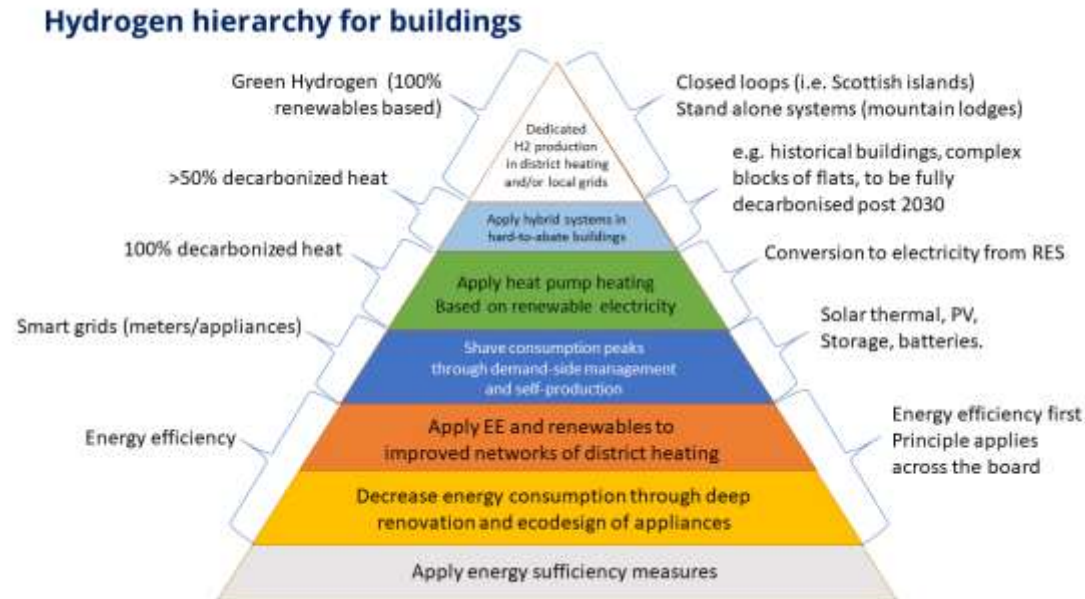
Figure 1.2. Relative efficiency of heating: electricity in heat pumps vs. electrolytic hydrogen in boilers



Source: CCC analysis.

Notes: The diagram shows the indicative efficiency of using a given amount of zero-carbon electricity in delivering heat for buildings. Whilst in practice each of the efficiency numbers could vary, this would not be sufficient to change the conclusion that heat pumps provide a much more efficient solution for providing heat from zero-carbon electricity than use of electrolytic hydrogen in a boiler.

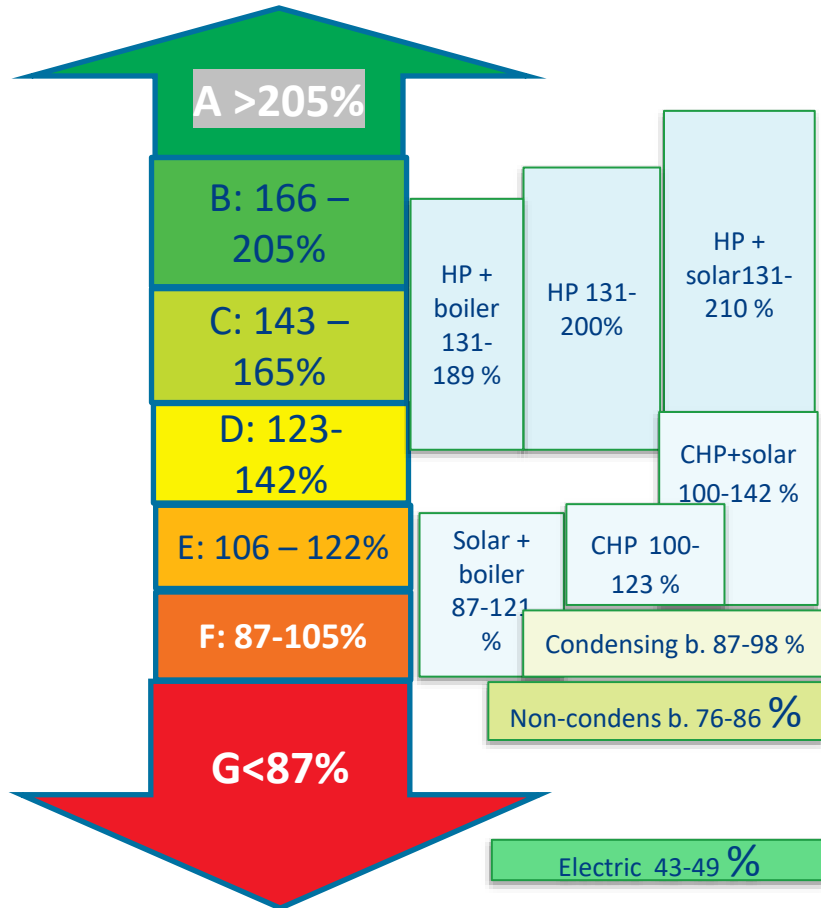
FOCUSED USE OF GREEN H2



Img 4 - The role of hydrogen in buildings

A NEW, RESCALED ENERGY LABEL

One that aligns with climate neutrality



WE NEED TO CHANGE LABEL AS PEF IS CHANGED FROM 2.5 TO 2.1, SO WHY NOT:

- Move to simple A-G label
- Make the bottom (G) label class for non-condensing boilers and electric boilers
- Make the next-to-bottom label class (F) for condensing boilers.
- Make the next labels (B,C,D, E) for installations with solar, heat pumps, CHP and combinations, including hybrids
- Make the highest label class (A) only be for the very best solutions and combinations available today.
- Make the label classes approximately the same relative width.

AND THUS...

2023

2024

2025

2026 onwards

Phase out electric water boilers G
(at least the larger ones)

Phase out inefficient electric
space heaters G

Phase out non condensing gas boilers G

Phase out condensing gas boilers F

**Only renewable
and hybrid heating
technologies
are available on
the market**

OBSTACLES

In the ecodesign and energy label arena

- Some MS still very conservative, hanging on to the “gas is a transitional fossil fuel” narrative
- Powerful lobbying by large industrial firms
- Hydrogen hype is mudding waters
- Progressive industrial organisations are not always very vocal
- Links with F-gas regulation



ARE BRANDS MAKING IT RIGHT?

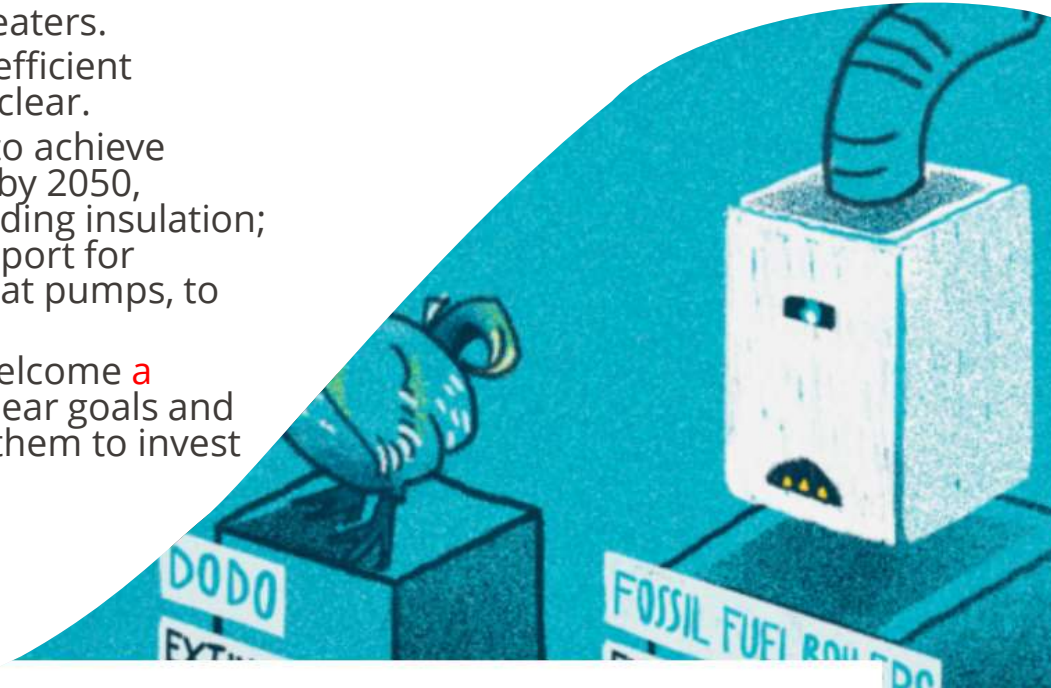
Brand audit research



KEY RESULTS

Brand audit research

- There is overwhelming support among **respondents for an immediate end to subsidies** in Europe for technologies that are not climate-compatible: fossil fuel boilers and inefficient electric heating products.
- There is **broad support for a legal ban on the sales of all domestic fossil-fuel boilers** and water heaters.
- Support for a legal ban on the sale of inefficient domestic electric heating products is unclear.
- Asked about the key measures needed to achieve climate-neutrality in the building sector by 2050, respondents highlighted: improving building insulation; an increase in renovation rates; and support for renewable technologies, in particular heat pumps, to make them affordable to the end-user.
- More generally, manufacturers would welcome **a reliable EU regulatory framework** with clear goals and policies that provide visibility and allow them to invest in the technologies of the future.



THANK YOU

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ALL DATA AVAILABLE AT
WWW.COOLPRODUCTS.EU

