Module 5.1
The current state of DHC in Europe

SHaKE – Sharing Heat and Knowledge on Energy Communities
Erasmus+ KA220-HED Cooperation Partnerships in Higher Education
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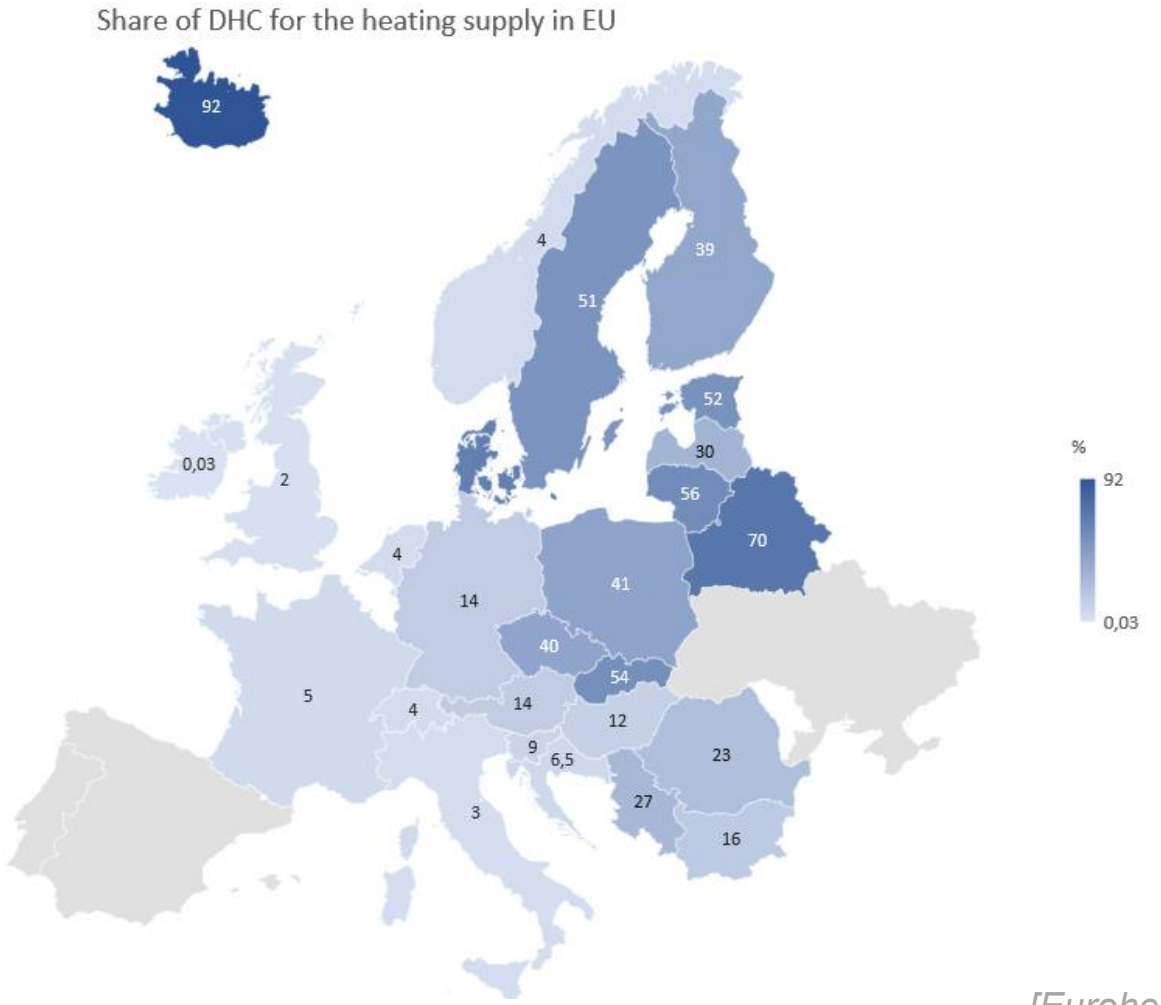
SHaKE
Sharing Knowledge on Energy Communities

1. The current state of DHC in Europe



DHC networks are well developed in Scandinavian and eastern Europe countries

DHC is the main space heating system in Iceland thanks to an important geothermal heat source

In western Europe DHC networks are not widely used

[Euroheat & Power ,2024]

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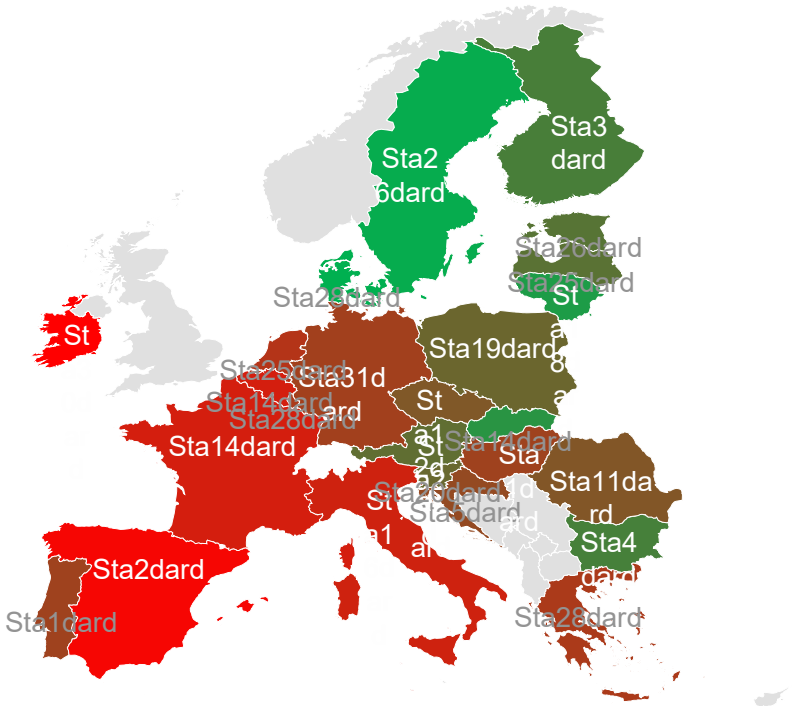
DHC potential developement in EU



DH market share vs district area (%)

Sta28dard

Sta30dard

DH Area: an area within a region where a DH system partially or fully supplies heat to buildings

DH market share within a district area: The share of heat demand in a DH area supplied by a DH system from total heat demand in the same area

In western European countries, there is a high potential for DH development. Actually, the DH systems face competition from gas boiler and electric heater

[Fallahnejad & al ,2024]

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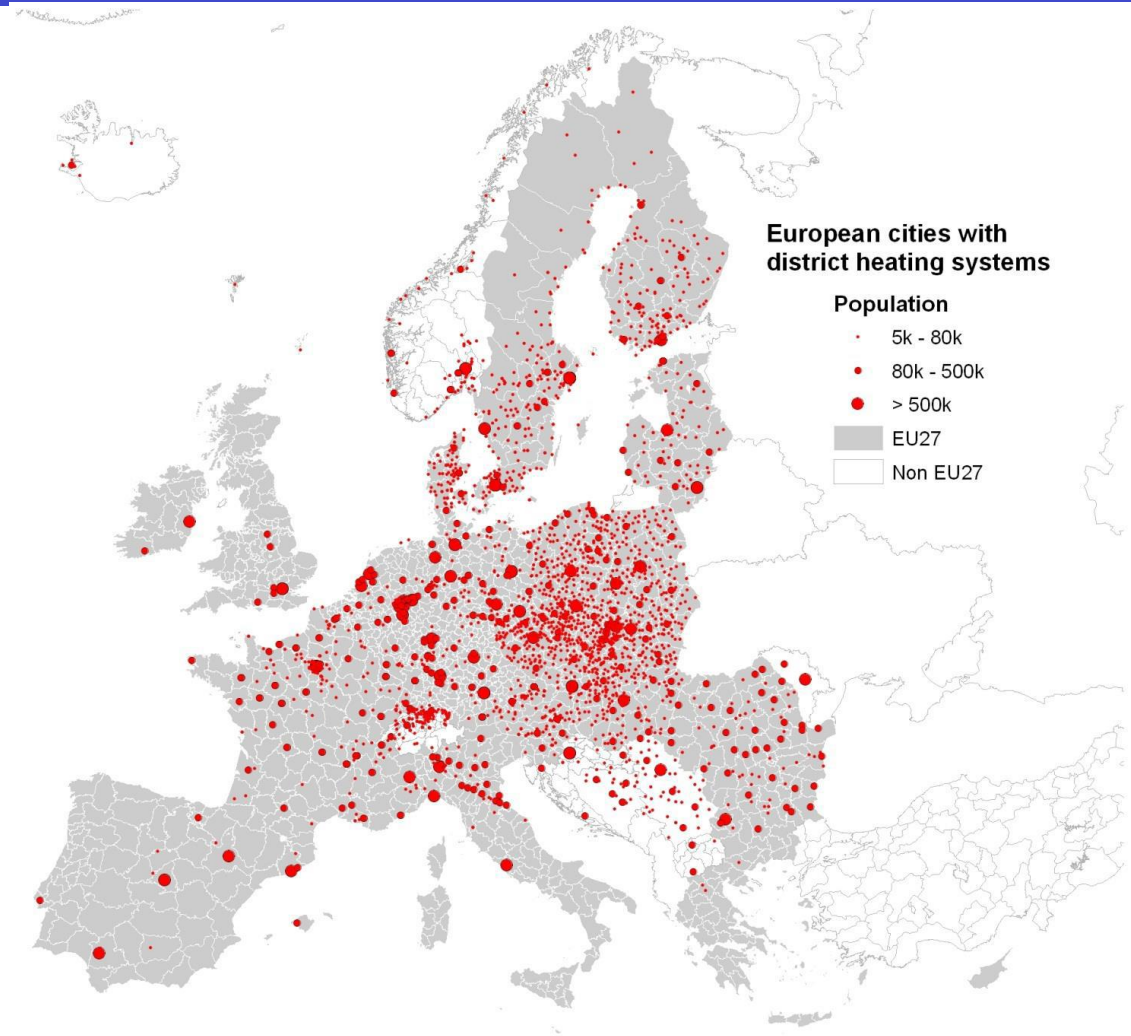

Due to their history and nature, DH systems are mostly used in dense urban area (Paris, Warsaw, Berlin, Copenhagen, Malmö, Stockholm, Riga, Praha, …)

In eastern Europe, small cities are also connected to DH networks.

The more the DH is developed in a country the more small cities are connected to DH

DH is also used in rural area, but these network are rarely listed

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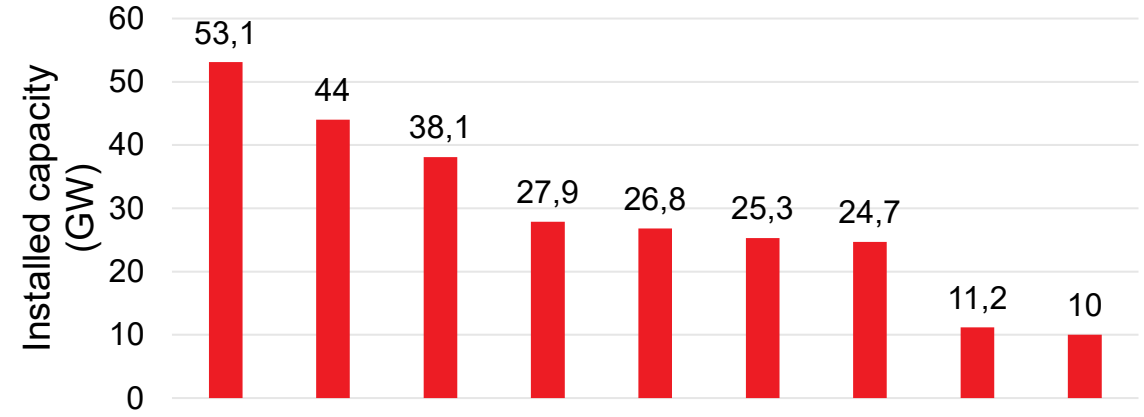

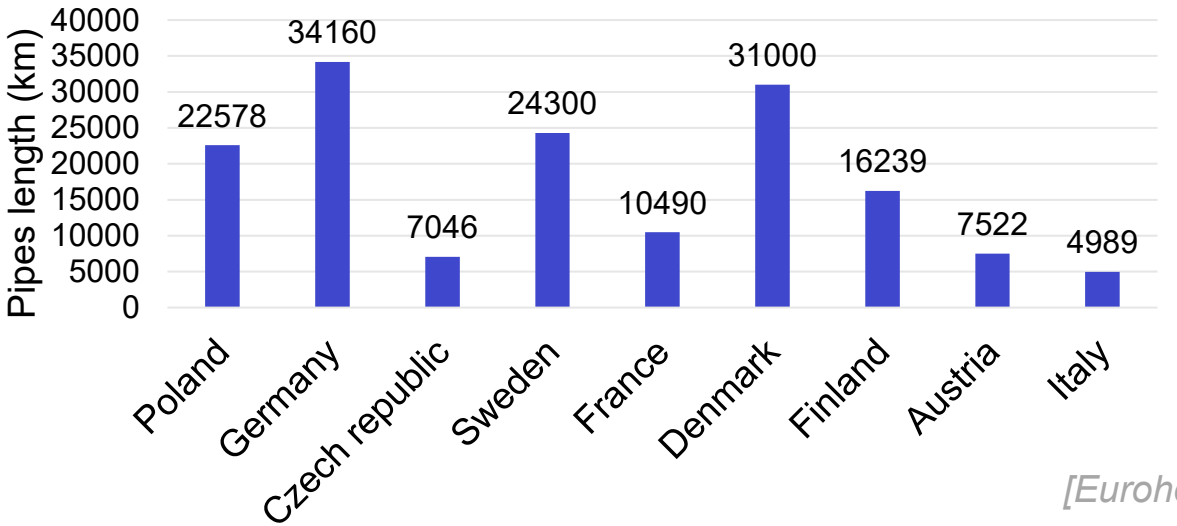

[Euroheat & Power ,2024]

- The total installed capacity in Europe is about 333.4 GW in 2022
- The installed capacity grew on Scandinavian and western Europe countries but decreased on eastern Europe countries
- Heating distribution networks represent 194 845 km
- The networks length increased by 4,5% compared to 2021
- The significative growth takes place in Germany, France (X2 in 10 years) and Finland (20% growth in 10 years)

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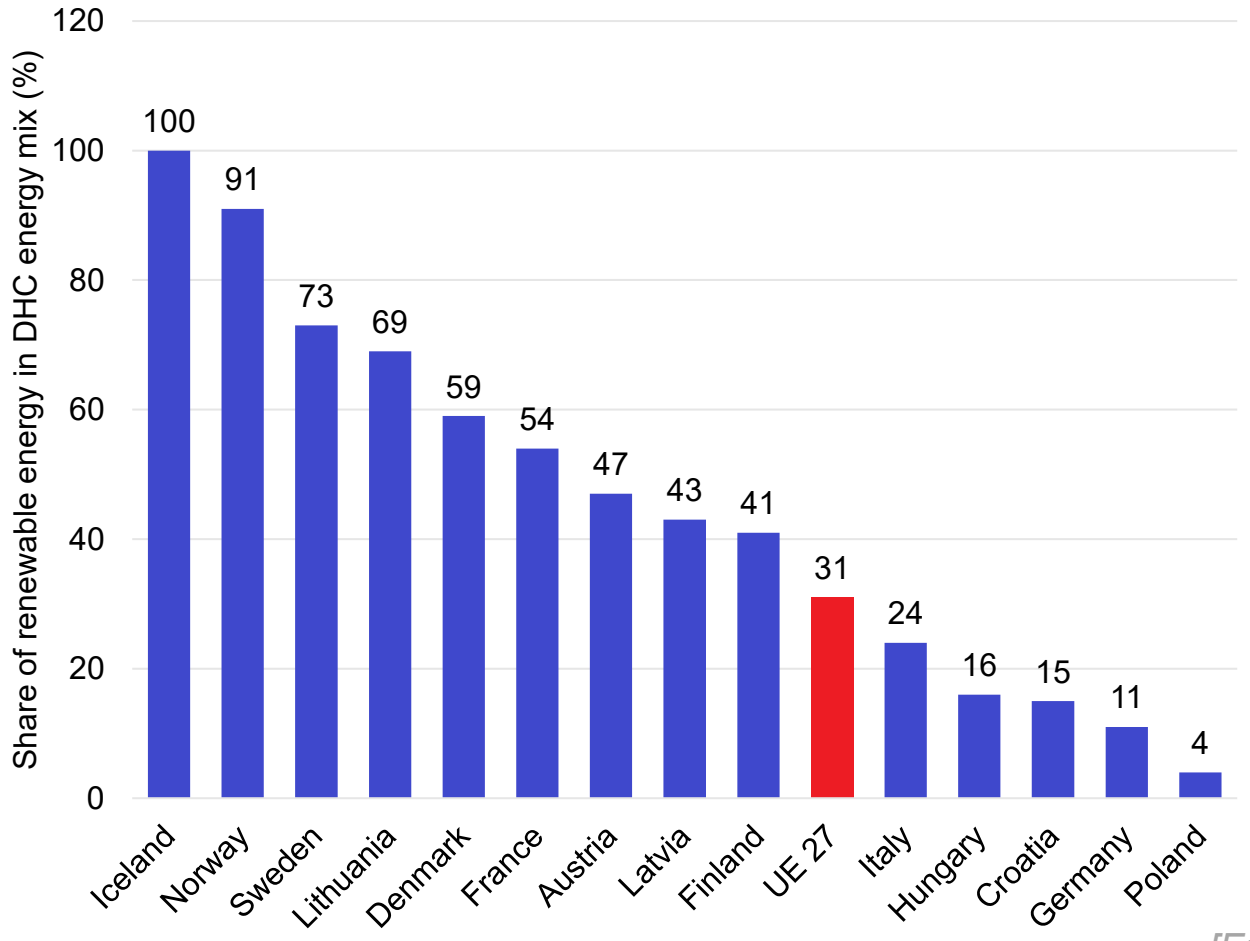

DHC networks in Scandinavian and Baltic countries use massively biomass

DHC networks in eastern Europe use massively coal and natural gas. The major part of the DHC network has been built during the cold war.

The mean share of renewable energy in EU is around 31%

[Euroheat & Power ,2024]

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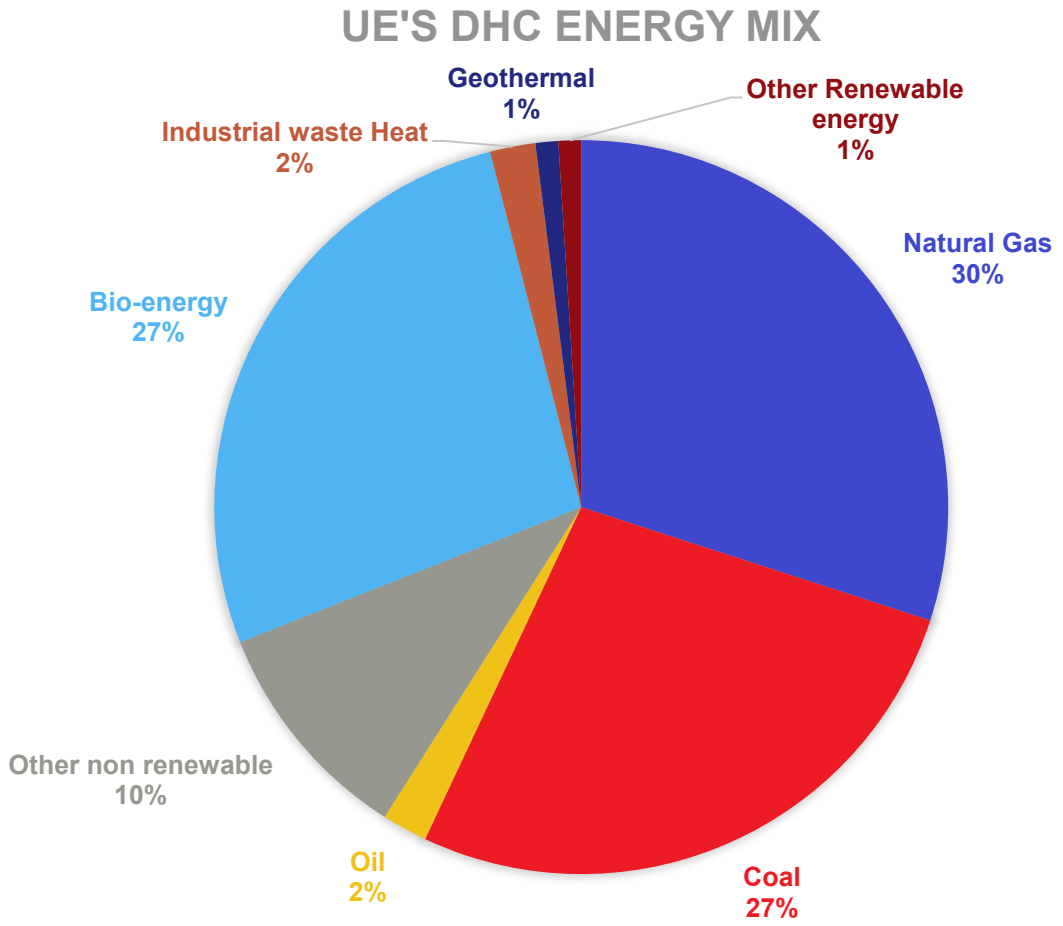

[Euroheat & Power ,2024]

Due to the common use of DHC in Scandinavian and eastern countries the biomass, the coal and the natural gas are widely used

The share of oil must disappear in the next years

The geothermal energy is still rare. Indeed, before the new-generation networks, only deep geothermal energy could be used. That's because it was necessary to have a temperature above 60°C at a low depth (1km). Now, with the new networks and the boom in heat pumps, low-depth geothermal energy is available everywhere.

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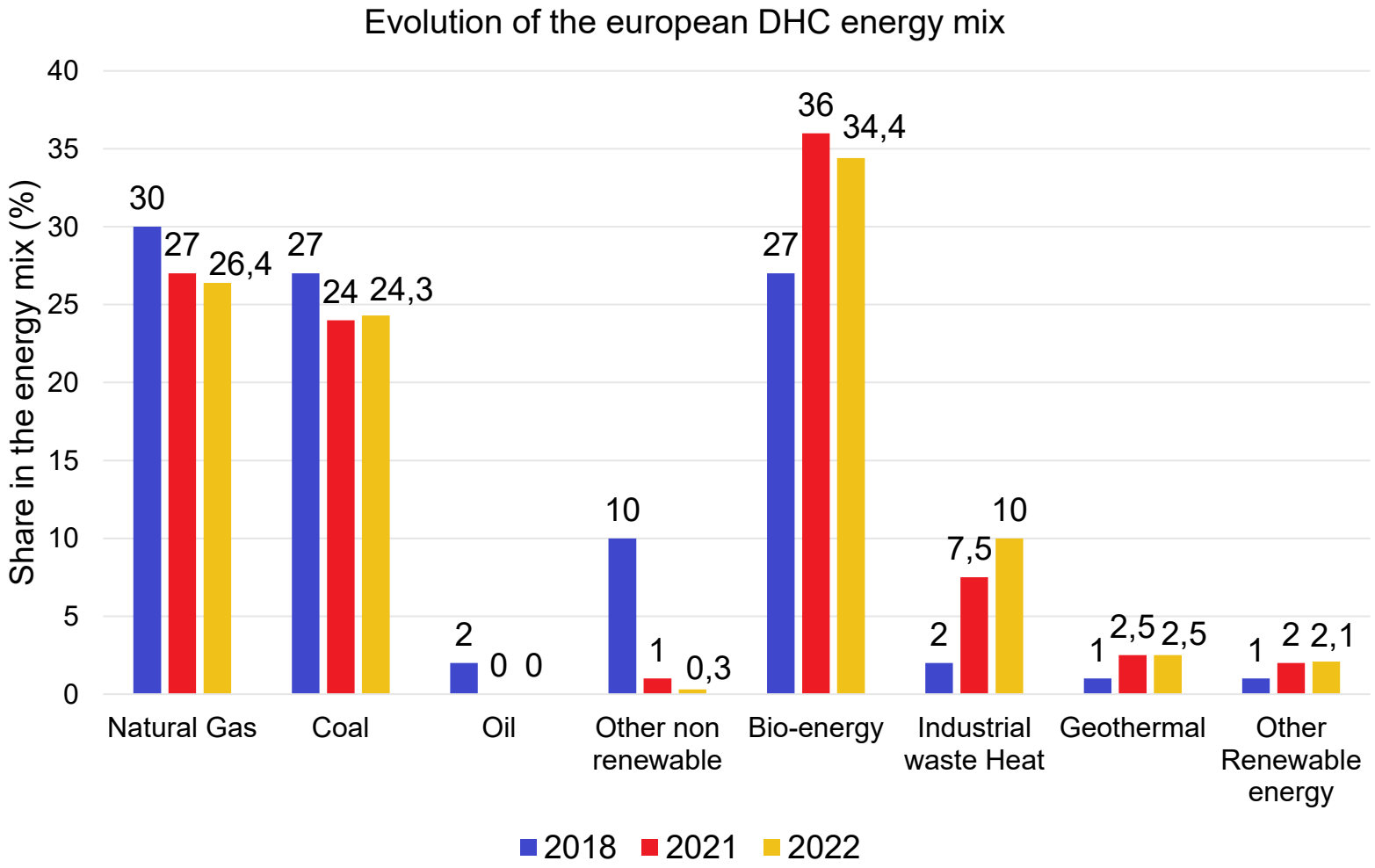

The share of biomass is increasing since 2018

The fossil fuel share is still important but it's decreasing

Thanks to incentive policies the share of waste heat is raising

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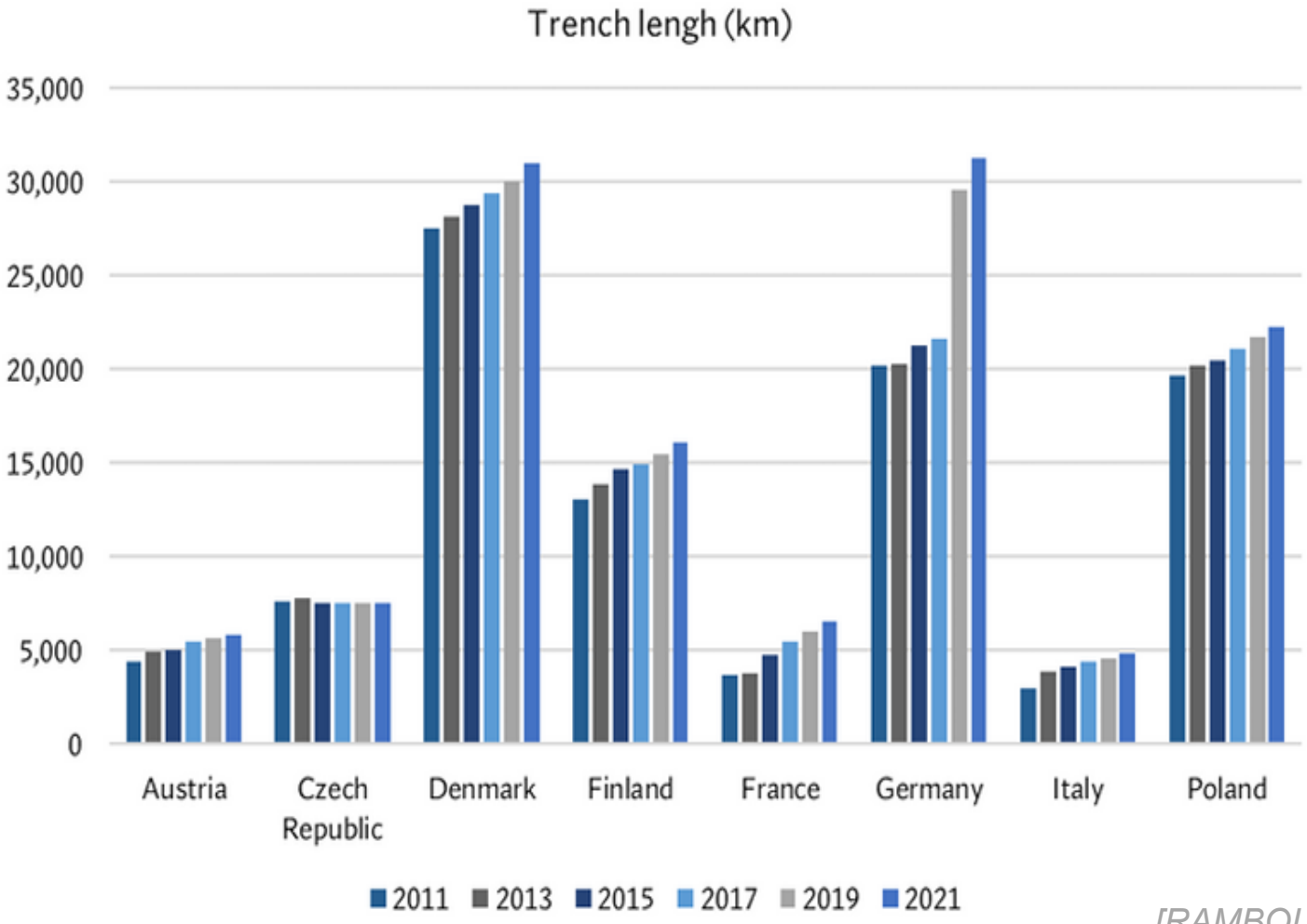

[RAMBOLL, 2020]

Since 2011 in Europe, the pipe length in DHC network is rising

In Europe, the DHC network are expending rapidly, thanks to support policies

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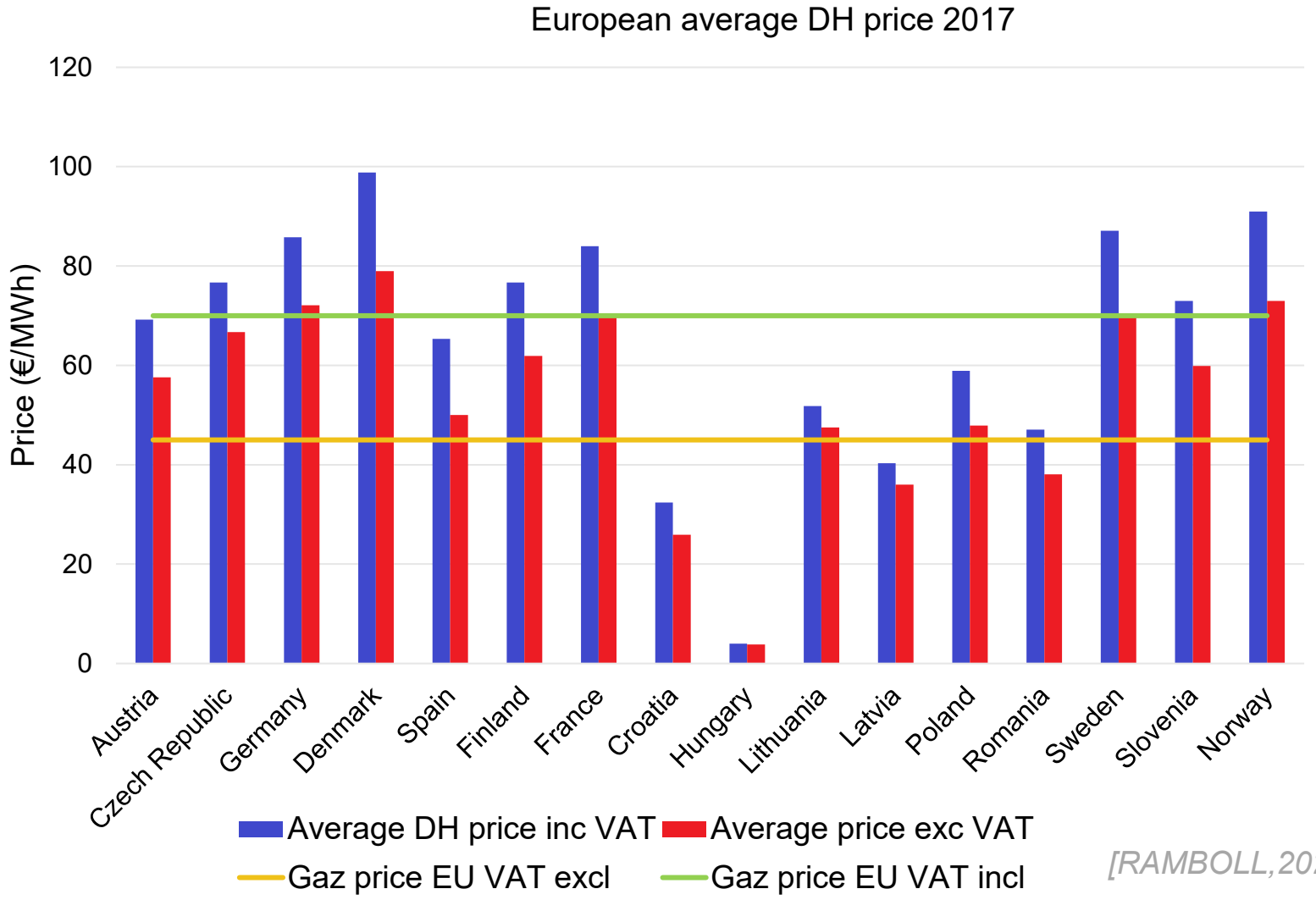

In most of the countries, the DH prices are competitive compared to the natural gas price

With the Russian gas crisis, the natural gas price has increased (80€/MWh VAT excluding 2024) and the DH systems seems to be the most economical solution for the users

[RAMBOLL,2020]

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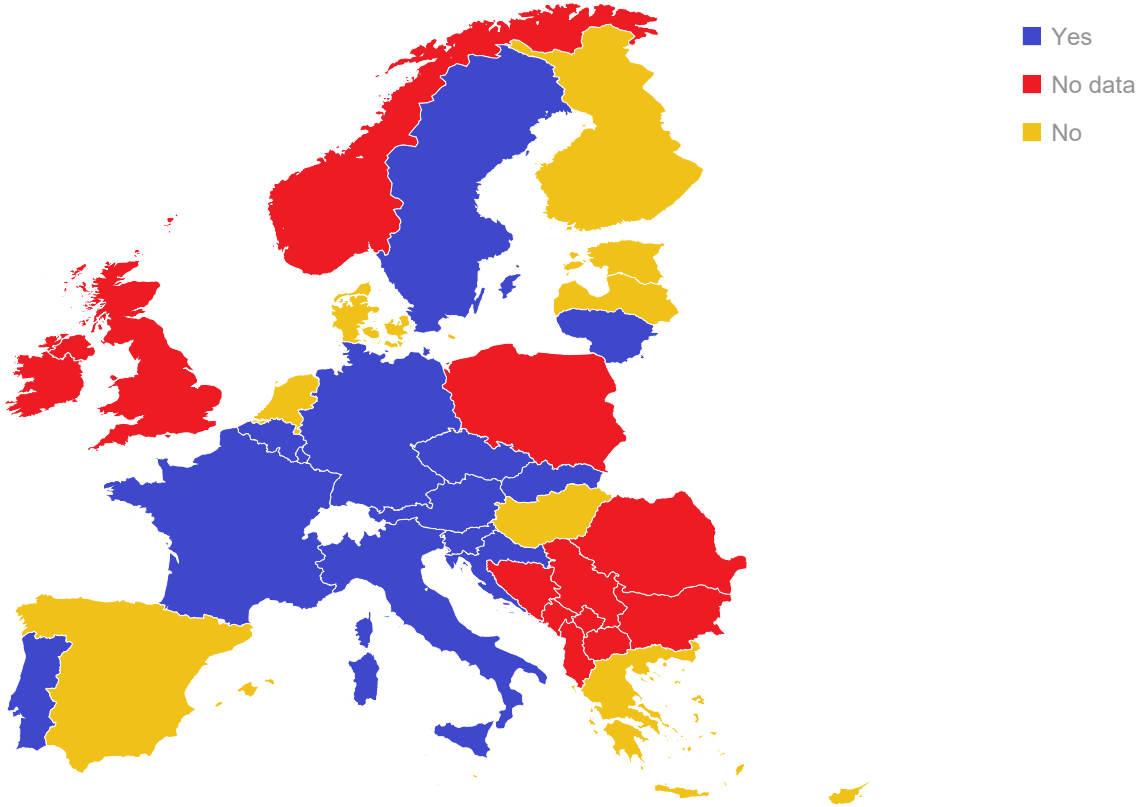
Inclusion and role of DH systems in long term strategy



[Muncàn & al ,2024]

- Decarbonization
- Expansion
- Modernization

Austria	Biomass, Heat pump, Solar thermal energy, Waste heat, Geothermal energy
Belgium	Biomass, Waste heat, Solar thermal energy, CHP
Croatia	Electric boilers, CHP, Diesel
Czech Republic	Gas, Biomass, Waste heat
France	Biomass, Heat pumps, Waste heat, Joule effect systems, solar thermal energy
Germany	CHP, Heat pumps, solar thermal energy, Waste heat
Italy	Solar thermal energy, Biomass, Waste heat, Heat pumps
Lithuania	90% Renewable energy
Luxembourg	Renewable energy, Waste heat
Slovakia	Biomass, Gas, Waste heat
Slovenia	Solar thermal energy, Heat pumps geothermal, Waste heat, Biogas

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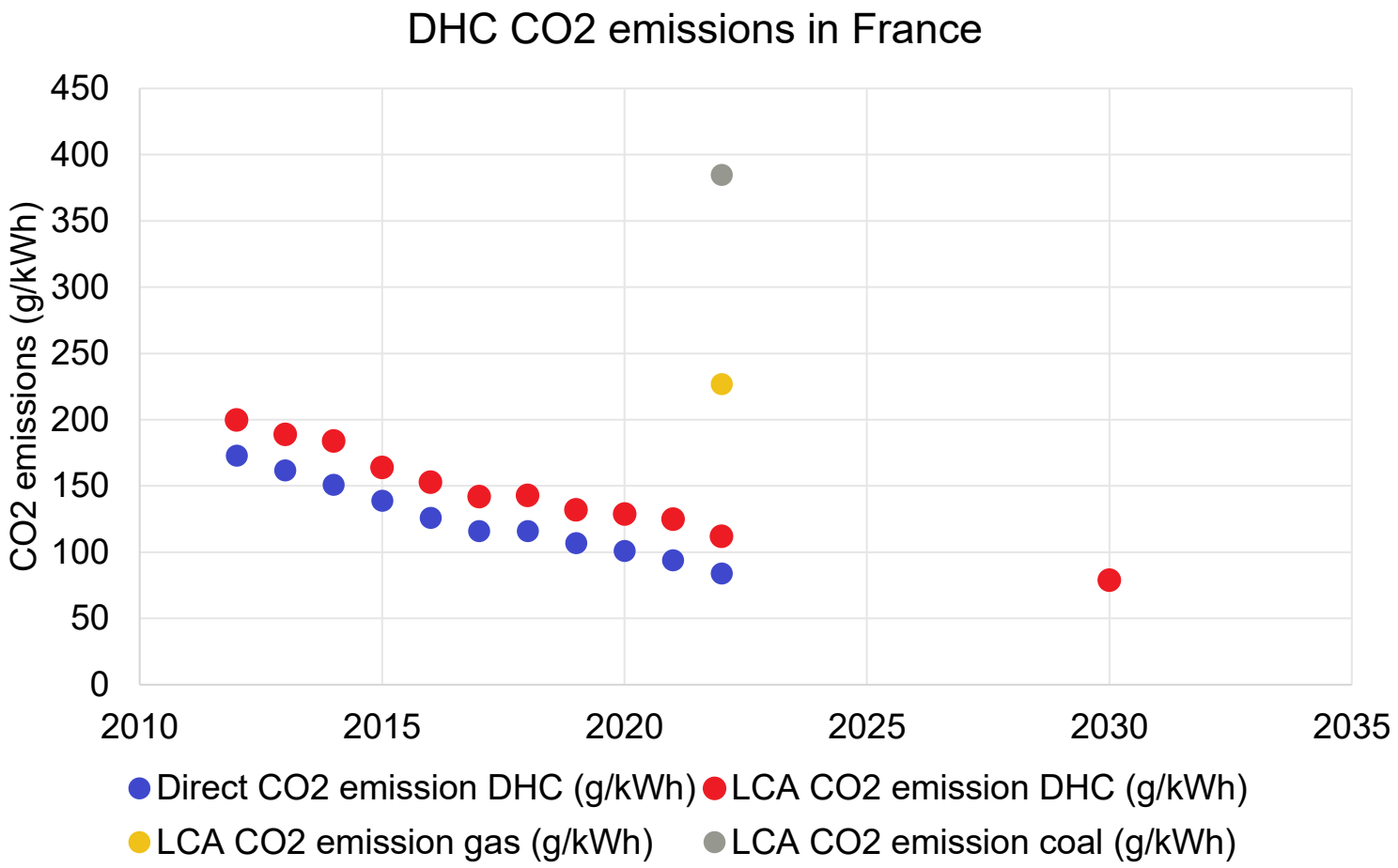

According to the widespread of renewable energy in the DH energy mix, the CO2 emissions due to the use of DH fall significantly.

In France, the heat supplied by DH systems is the most decarbonizing in the heat market (except from biomass boiler)

[SNCU,2023]

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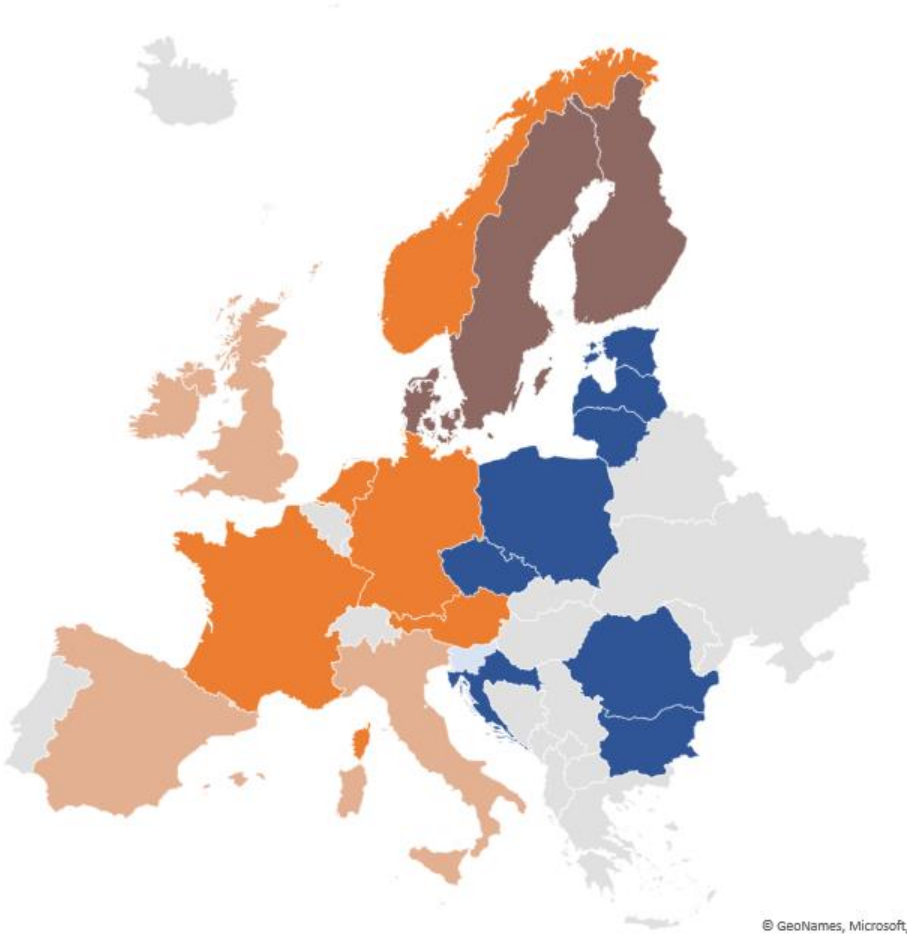
	Expanding rapidly	Expanding	In development	In rehabilitation
Context	Strong RE culture	A growing energy policy	Energy policy under construction	Former USSR RE policy Lack of budget
Supporting measure – Offer	+ + +	+ +	+ +	+
Supporting measure – Demand	+ + +	+ +	+	+
Supporting measure – RE	+ + +	+ +	+ +	+

+ + + Strong support

+ + Medium support

+ Low support



[Euroheat & Power ,2024]

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Reduction of 55% of the CO_2 emissions (compared with 1990) in all sectors including space heating and cooling

Renewable Energy Directive EU

Increase of the share of renewable energies in the energy consumption to 42% at least

An augmentation of 1% to 2,1% by year of the renewable energies share in the DHC network energy mix up to 2030

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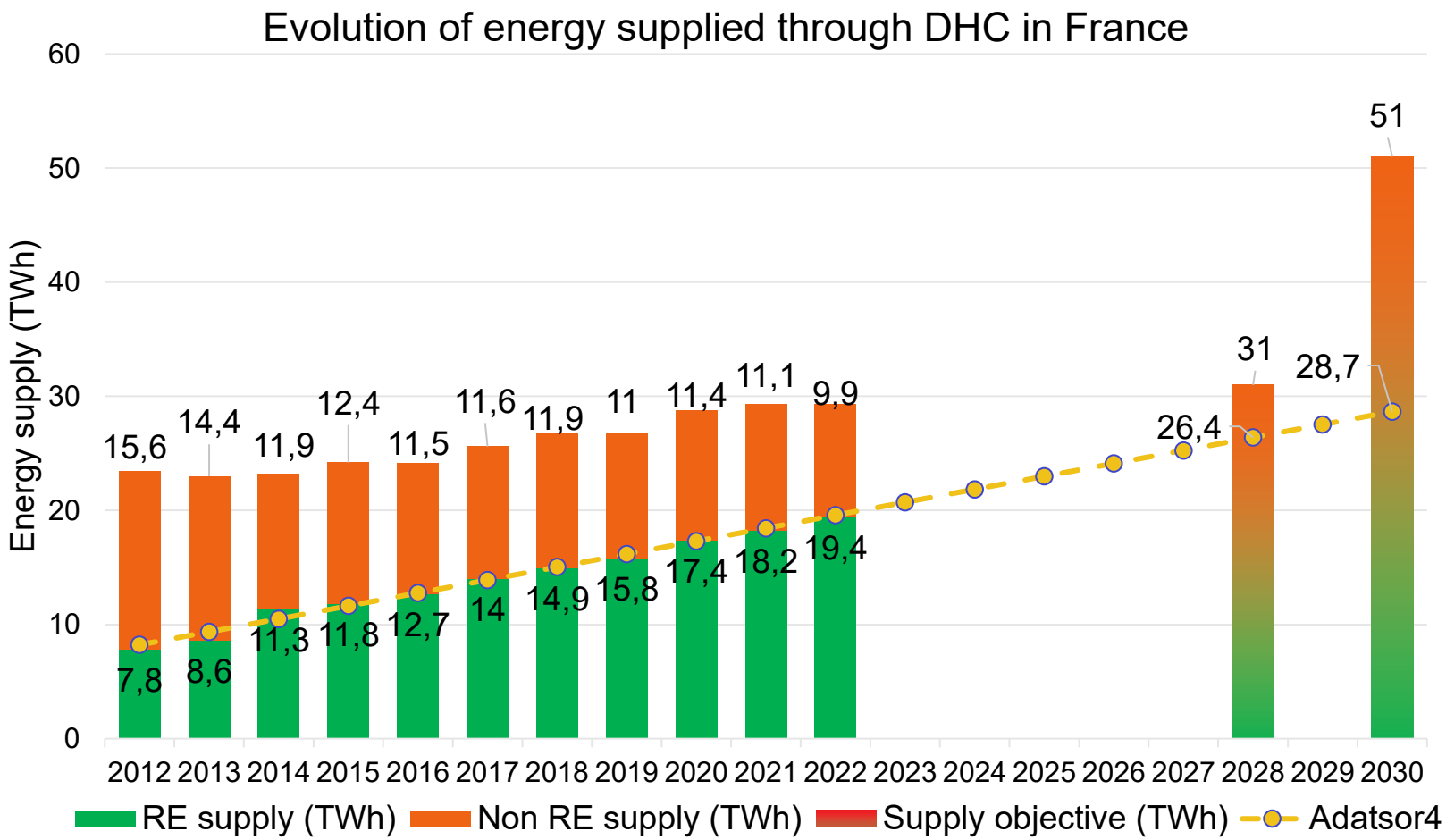

The total and the renewable heat supplied by DH is in constantly growing helped by national and European policies and support

The national and European objectives through 2030 will not be archived following the actual tendency in France

[SNCU ,2023]

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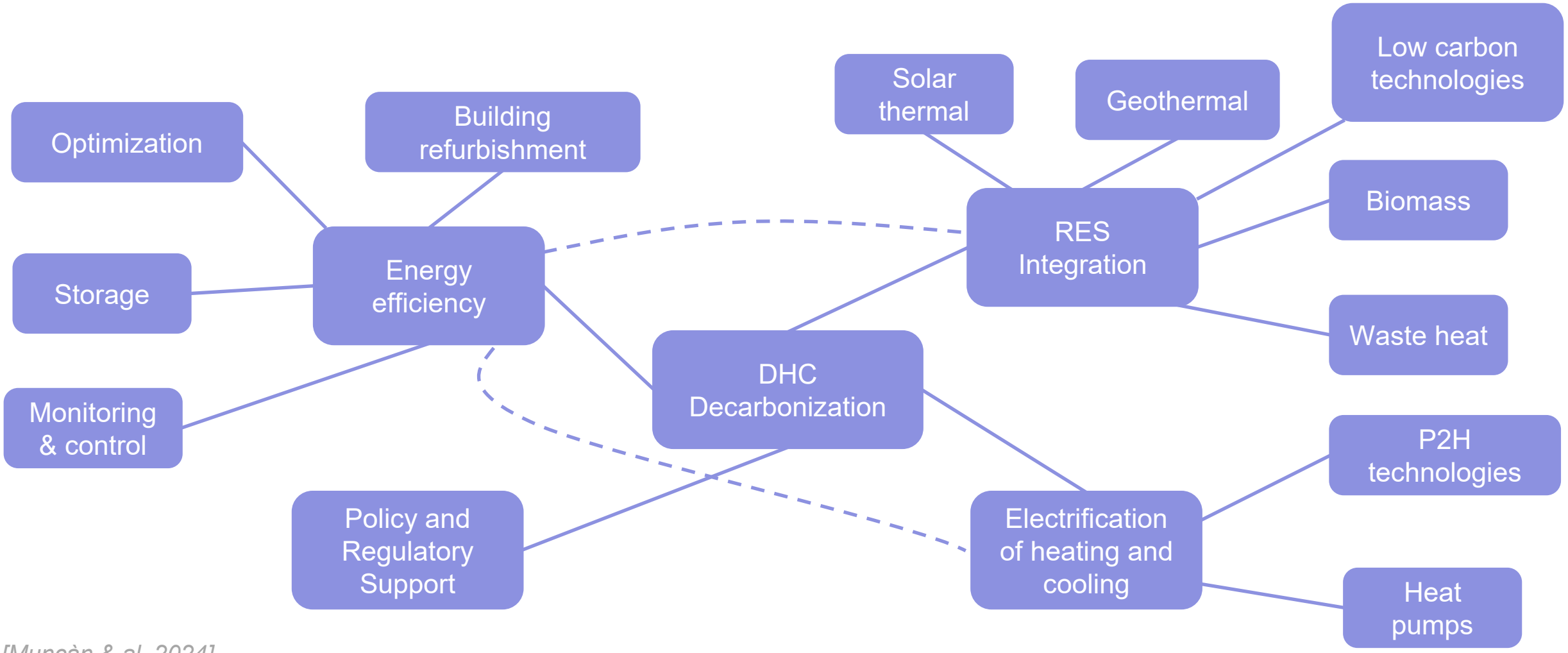

[Muncàn & al ,2024]

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How can we meet European/national targets for the share of renewable energy in heating networks ?

Create new 4th and 5th generation DHC networks

Improve the performance of existing networks

Renovating the heat generation plants of 1st and 2nd generation DHC network

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Thank you!

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https://www.shakeproject-dhc.eu/

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