



DISCUSSION PAPER

by the Energy Community Secretariat

How would heating and cooling sector contribute to EU 2030 decarbonisation goal – NECPs measures

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1. Introduction

In EU households, heating and hot water account for 79% of total final energy use and approximately 75% of heating and cooling is still generated from fossil fuels. The heating and cooling sector was, compared to the electricity sector, neglected in terms of making it more green and more sustainable, despite it taking such a great share of total final energy use. The Clean Energy Package for all Europeans addressed the heating and cooling sector in a more ambitious way by introducing annual indicative targets in Article 23 of Renewable Energy Directive (EU) 2018/2001¹ (RED II). Moreover, it establishes comprehensive planning of the energy transition by setting the obligation of drafting and adopting the integrated national energy and climate plans (NECPs) for the period of 2020 to 2030 in the Governance Regulation². NECPs have replaced national renewable and energy efficiency action plans, aiming to integrate and coordinate planning of different dimensions of the energy sector of one country. Namely, the plans address decarbonisation (greenhouse gas emissions and renewable energy), energy efficiency, security of supply, internal energy market and research and innovation. Under the Governance Regulation, countries are also required to develop national long-term strategies and ensure consistency between them and the 10-year NECPs.

According to the Governance Regulation, certain aspects of heating and cooling and district heating sectors need to be addressed in the NECPs. With regards to the decarbonisation dimension, and in particular renewable energy, national authorities need to set a target or projection of the share of renewable energy sources (RES) in the heating and cooling sector. NECPs should reflect the annual increase of the renewable energy share in the heating and cooling sector and the role of waste heat, reflecting contributions of the sector on a yearly basis and in absolute values, as well as the respective technologies that will contribute to the target. **RED II requires that the annual increase of the share of renewable energy in the heating and cooling sector is 1.3 percentage points (ppt) starting from 2020 up to 2030** (Article 23(1) RED II).³ If the share of RES in the heating and cooling sector in 2020 was above 60%, such a share may be considered as fulfilling the required increase of 1.3 ppt. It means that countries are not required to achieve the increase of 1.3 ppt annually nor to adopt specific measures. If the share was between 50 and 60 %, such a share may be considered as fulfilling half of the annual increase of 1.3 ppt (Article 23(2) RED II), and countries still need to define measures for the increase of renewable heat.

As for the district heating sector, **it should contribute to the share of the heating and cooling sector by either implementing measures that will increase the share in the district heating sector for 1 ppt annually or ensuring that operators of district heating are obliged to connect suppliers of energy from renewable sources and waste heat and cold to the network**. As for the former option, measures are supposed to be described in the NECPs. However, if the current share of renewable energy in district heating is higher than 60% in 2020, it will be counted as fulfilling the obligation of the 1 ppt increase annually and countries are not obliged to achieve the increase of 1 ppt annually. Nevertheless, if the share of district heating and cooling is less than or equal to 2% of the overall consumption of energy in heating and cooling, the district heating sector is not obliged to contribute to the increase of the share of renewable energy sources in the heating and cooling sector (Article 24 (10) RED II).

¹ Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources

² Regulation (EU) 2018/1999 of the European Parliament and of the Council of 11 December 2018 on the Governance of the Energy Union and Climate Action

³ If waste heat is not calculated, the annual increase should be 1.1 ppt

With regards to the energy efficiency dimension, long-term indicative trajectories have to be provided for 10-year periods until 2050, indicating sectoral targets and strategies in buildings, transport and heating and cooling sectors. One of the mandatory sections of NECP is the description of the current potential for the application of high-efficiency cogeneration and efficient district heating and cooling. The potential is assessed under the obligation of Article 14 of the Energy Efficiency Directive⁴ and relevant parts of these assessments are usually transferred in the plans. Article 15 (7) RED II introduced an obligation that a part of the assessment under Article 14 of the Energy Efficiency Directive is also an assessment of the potential of energy from renewable sources and of the use of waste heat and cold in the heating and cooling sector.

The dimension energy security that relates to objectives of diversification of energy sources, the reduction of import dependency and the improvements of grid flexibility for the integration of renewable sources might be relevant for district heating if the sector depends on imported fuels or provides flexibility for the electricity sector.

While the dimension internal energy market mainly relates to the interconnectivity and improvements of electricity and gas infrastructure, it also covers integration of decentralized sources. This aspect could be relevant for the heating market, which becomes more and more competitive.

The recognition of heating and cooling and district heating sectors as sectors that could significantly contribute to the energy decarbonisation and to couple with other sectors has accelerated research and innovation activities and emergence of new technologies in these sectors. Therefore, NECPs could contain measures within this dimension addressing innovation and competitiveness in the heating market.

The legislative acts of the Clean Energy Package, namely RED II, amendments of the Energy Efficiency Directive⁵ and the Governance Regulation should be adopted by the Ministerial Council in November 2021 and thus obligations stemming from these documents will be also binding for the Energy Community Contracting Parties.

This report assesses the NECPs of seven EU Member States with different outlooks of heating and cooling sectors: Denmark, Ireland, Latvia, Lithuania, the Netherlands, Poland and Sweden. It provides insights into the stages of the development of the heating and cooling and the district heating sectors, as well as targets and measures for the development of the sectors in the period from 2020 to 2030. The focus is placed on measures for deployment of renewable energy in the respective sectors, providing information on possible regulatory and financial solutions for the integration of renewable energy in the heating and cooling sector.

⁴ Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency

⁵ Directive (EU) 2018/2002 of the European Parliament and of the Council of 11 December 2018 amending Directive 2012/27/EU on energy efficiency

2. Denmark



RES shares

	H&C	DH
2020	54%	70%
2030	60%	80%

65% of households supplied by DH

Objective: 90% of district heating consumption free of coal, oil or gas by 2030

A high share of biomass in the energy mix of the Danish heating and cooling sector was due to the exemption of biomass-based heat generation from energy and carbon taxes. Measures in the Danish NECP intend to make the energy mix in the heating and cooling sector more diverse and to support the uptake of heat pumps and the deployment of geothermal and solar thermal energy. Heat pumps should utilize a variety of low-temperature heat sources such as air, ground and sea water, as well as intermediate temperature sources such as geothermal energy and low grade waste heat. Heat pumps as well as the district heating sector and thermal storages are recognised as technologies for providing flexibility to the whole energy system. A connection to district heating is not mandatory anymore, and the heating sector is expected to be more market oriented.

Support for specific technologies

- Heat pumps
- Geothermal
- Solar thermal

Policy/regulatory measures

- Assessment of legislative constraints in the heating sector as the basis for a new heating market model
- Obligatory connection to DH is ceased
- Assessment of administrative and legislative barriers for the expansion of district cooling networks

Incentives

- As of 2021, reduction of the electrical heating tax
- Fund for utilisation of waste heat – 133 mil DKK/year (cca 17,8 mil EUR)
- Technology neutral support scheme – 114 mil DKK (cca 15,3 mil EUR)

3. Ireland



	RES shares	
	H&C	DH
2020	7.8%	-
2030	24%	-

DH covers only about 0.8% of heat demand

Objective: installation of oil and gas boilers in new buildings is forbidden from 2022 and 2025 respectively

The Support Scheme for Renewable Heat (SSRH)⁶ is an initiative of the Government of Ireland for the uptake of renewable energy sources in the heating sector, providing both investment grants and operational aid. Despite not having a well-established district heating system, an updated comprehensive assessment of the potential for high-efficiency cogeneration and efficient district heating of 2020 determines the potential locations for district heating in Ireland. Two district heating pilot schemes are being developed with innovative technologies using waste heat from data centres, which should provide experience and knowledge for the uptake of district heating projects nationwide.

Support for specific technologies

- Heat pumps (600.000 in individual households by 2030)
- Biomass and biogas boilers and CHPs
- Waste heat

Policy/regulatory measures

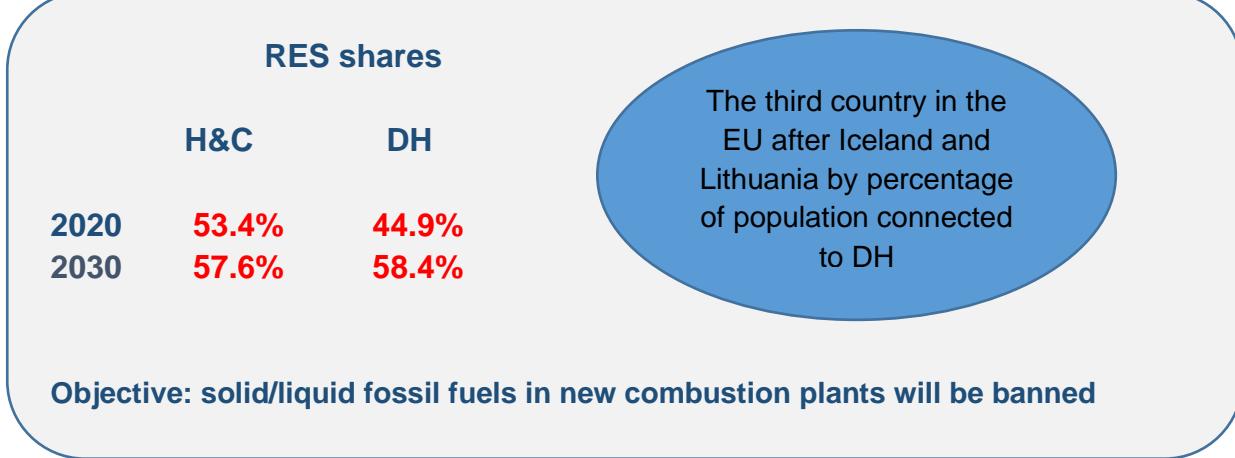
- A new policy framework for the development of district heating
- Banning installation of oil and gas boilers in new buildings from 2022 and 2025 respectively; in existing dwellings to be phased out gradually

Incentives

- Investment grants up to 30% for air, ground and water source heat pumps under SSRH
- 15-year long operational aid for biomass/biogas boilers and CHPs under SSRH
- The development of new district heating projects (the city of Dublin and Tallaght - suburb of Dublin) under the Climate Action Fund

⁶ <https://www.seai.ie/business-and-public-sector/business-grants-and-supports/support-scheme-renewable-heat/>

4. Latvia



Latvia will carry out an assessment of different types of heating technologies to determine the most efficient ones. Due to outdated heating systems, the primary aim is to modernise infrastructure and existing biomass plants and to increase use of heat and cold pumps. Latvia recognises the need for district cooling as a simple and safe solution. With regards to individual heating, self-generation and self-consumption of energy in individual households, using zero-emission technologies is promoted. It is planned that average thermal energy consumption of the building stock is to be 30% less by 2030.

Support for specific technologies

- Modernisation of existing biomass plants
- Heat and cold pumps

Policy/regulatory measures

- Liberalisation of the heating market, easing conditions for building new capacities by third parties
- Use of solid or liquid fossil fuels in new combustion plants is banned, with the exemption of using these fuels as backup option in very limited quantities
- Strengthening the role of district heating by introducing zero-emission technologies
- Support for new DH connections by ensuring lower tariffs and implementing energy efficiency measures for rational use of heat

Incentives

- Review of excise duties system and tax reliefs
- More than 100 projects to install storage systems, heating generation capacities and renovating heating pipes are supported under EU structural funds

5. Lithuania



RES shares

	H&C	DH
2020	50%	71.7%
2030	67.6%	90%

DH systems are well developed in all cities, supplying about 53% of all buildings and 76% in cities

Objective: installation of 200 MW of renewable energy capacity in DH by 2030

Due to the importance of the district heating sector and high target of renewable energy set for 2030, Lithuania has defined principles of the development of the sector: transparency, competitiveness, efficiency and progress. Lithuania plans to enhance the regulatory environment to be attractive for investments, providing non-discriminatory treatment for all players. As a result of the public consultations on the draft of NECP, alternative policy measures are included in the plan and their implementation will be additionally assessed. Those measures relate to full elimination of fossil fuels in the heating sector by 2030, restriction of connecting new buildings to the gas network, introduction of green heat certificates and obligation imposed on municipalities to buy only green certified heat.

Support for specific technologies

- Solar thermal technologies, including storage
- Heat pumps (in 50.000 households by 2030)
- Biomass
- Waste heat
- District cooling

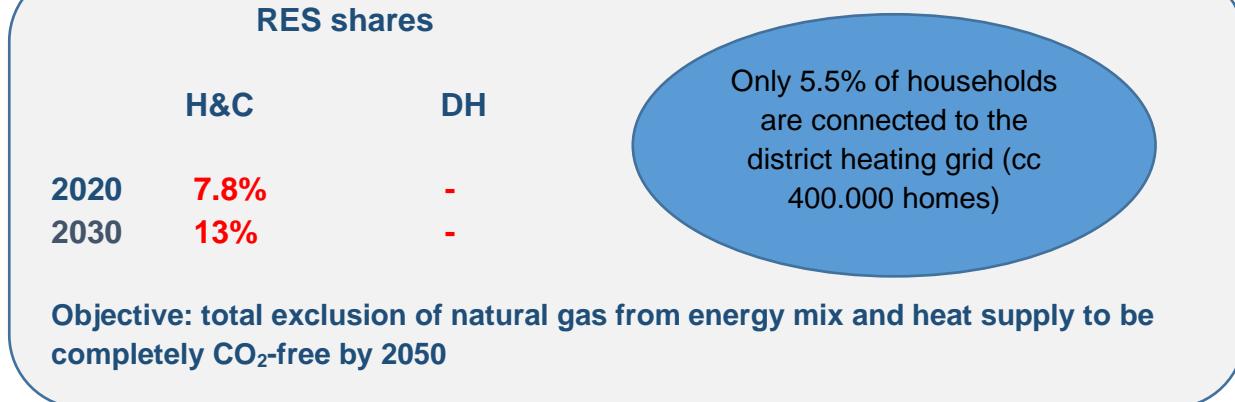
Policy/regulatory measures

- General inventory and assessment of the heating installations in individual households
- Increasing competitiveness of biofuel market, and balancing between import and domestic sources; issuance of certificates for sustainable forest management
- Support for new DH connections

Incentives

- Investment aid for new RES-based heat installations
- Support for modernisation of the heat transmission network and introduction of remote heat metering systems

6. Netherlands



Natural gas is currently the most common source of heating in the building sector of the Netherlands. The Netherlands decided to completely halt natural gas extraction from the Groningen field, which will impact on investments in energy infrastructure as a whole. New district heating infrastructure is assessed in the building sector, and there is estimation of district heating growth for 9% from 2020 to 2030. 1.5 million existing homes and 15% of non-residential real estate are expected to become natural gas-free by 2030. Measures for achieving set objectives of the heating sector are envisaged for building sector, industry and agriculture sectors.

Support for specific technologies

- Heat pumps
- Geothermal energy and aquathermal
- Solar thermal and large-scale thermal storage
- Waste heat from industry

Policy/regulatory measures

- No connection of new buildings to natural gas network
- Municipalities are governing transition of local heating systems, cooperating with regions on establishing regional energy strategies and the regional heat structure

Incentives

- Increasing taxes on gas, and decreasing it on electricity
- Under the Geothermal Master Heat Plan⁷, 17 projects are developed and 35 are planned in the building and greenhouse horticulture sector by 2030
- Investment Grant for Sustainable Energy (ISDE) and Heat Fund are established for sustainable installations such as heat pumps and energy efficiency measures
- Operating aid for renewable heat is available under the Stimulation of Sustainable Energy Production and Climate Transition (SDE++) scheme⁸

⁷ https://geothermie.nl/images/bestanden/Masterplan_Aardwarmte_in_Nederland_ENG.pdf

⁸ <https://english.rvo.nl/sites/default/files/2020/11/Brochure%20SDE%20plus%20plus%202020.pdf>

7. Poland



RES shares

	H&C	DH
2020	17.4%	2%
2030	28.4%	28.4%

Around 60% of households in urban areas are connected to DH

Objective: 70% of households to be connected to DH, and at least 85% of DH&C systems of more than 5 MW to be categorised as energy-efficient

District heating plants in Poland predominately rely on coal, with renewable energy sources having accounted for only 2% in 2015. Biomass is to replace coal in district heating and become the main source of energy. In the long run, district heat should be produced mainly through CHP. Municipalities play an important role in supporting development and modernisation of the district heating network and integration of RES in district heating.

Support for specific technologies

- CHPs
- Biomass
- Incinerators
- Heat storages

Policy/regulatory measures

- Certification of installers of RES equipment
- Simplification of procedures for investing in district heating network infrastructure
- Changing the heat market model and tariff policy

Incentives

- Operational Programme Infrastructure and Environment, and Regional Operational Programmes (ROP) for renewable heat production and energy efficient measures
- Polish Geothermal Energy Plus programme
- SMOG STOP and “Clean Air” investment aid for replacement of individual heating devices
- Tax relief for individual households for procuring material and equipment (windows and doors, heat pumps, solar collectors, etc.)
- CHPs that feed 70% of useful heat into the DH network could obtain operating aid for electricity from high-efficiency CHPs

8. Sweden



RES shares

	H&C	DH
2020	69.2%	-
2030	72.2%	-

DH is well developed, not regulated, competes with other heating forms.
In smaller buildings, direct electrical heating is used

Objective: the heating and cooling sector based on market mechanisms

In 2017, biofuels accounted for 86% of total renewable energy used for heating purposes in industry, district heating and housing sectors, followed by heat pumps with around 14% and a small share of solar heat in the housing sector. Since the share of RES in the heating and cooling sector is already higher than 60%, a further increase is not required under the RED II, and the NECP does not envisage target or specific measures. A current share and projections for 2030 for the district heating sector are not determined. The obligation to conduct an assessment of the necessity to build new infrastructure for district heating and cooling produced from renewable sources lies with the owners and depends on the profitability of such investment. Within the research and innovation dimension, measures for the development of new innovative technologies are promoted, such as participation in expert networks, i.e. the EU's technology and innovation platform Renewable Heating and Cooling.

Support for specific technologies

- Heat pumps

Policy/regulatory measures

/

Incentives

- Support for switching from fossil oil to biofuel or district heating and for the expansion of smaller district heating networks under the programme Klimatkлив
- Heat generation installations that use biofuel are exempted from energy and carbon tax
- A deduction of 9% of the labour costs associated with installing solar heating systems for households
- Up to 20% of investment aid for installation of hybrid solar electricity/heat systems is provided

9. Summary

Renewable energy sources represent more than 50% of the energy used in the heating and cooling sectors of four of the assessed EU Member States (Denmark, Latvia, Lithuania, Sweden). Sweden is leading with the share of almost 70%, for which reason it is not obliged to comply with the obligation of increasing RES for 1.3 ppt annualy. The most ambitious target for the increase of RES in the heating and cooling sector was set by Lithuania, aiming for an increase of 17% by 2030.

With regards to the share of RES in the district heating sector, Denmark, Latvia and Lithuania have already significant shares - between 40% and 60%. Lithuania has set an ambitious target for the share of RES in district heating – the share should increase to 90% in 2030. Ireland and the Netherlands have not calculated projections of the share of RES in the district heating in 2030, due to the low share of district heating in overal heating consumption.

Table 1 Shares of RES in H&C and DH sector for 2020 and 2030

	Denmark	Ireland	Latvia	Lithuania	Netherland	Poland	Sweden
RES in H&C 2020	54%	7.8%	53.4%	50.9%	7.8 %	17.4%	69.2%
RES in H&C 2030	60 %	24%	57.6%	67,6%	13%	28.4%	72.2%
RES in DH 2020	71%	N/A	44.9 % ¹	71.7%	N/A	2% ²	N/A
RES in DH 2030	80%	N/A	58.4 %	90%	N/A	29%	N/A

With regards to the specific measures for the integration of RES technologies, all countries will support the deployment of **heat pumps**, mostly in individual households as an instrument for replacing fossil-fuel individual heating appliances. **Biomass** is the most used source in the heating and cooling sector of all countries, supported with different measures such as operating aid, tax exemptions or sustainability certificates. Support to **biogas** is mentioned only in Ireland, despite it have a great potential to be used locally in district heating. Measures for the support of **geothermal energy and solar thermal energy**, mostly in the form of operating aid, are also present in some countries (Denmark, Netherland, Poland). Potential for the utilisation of **waste heat** is recognised in most of the countries, and measures for its exploitation are envisaged, except in Latvia. With regards to development of **cogeneration** installations, Poland is ambitious in supporting cogeneration plants. A plan to utilise **waste to energy technology** is envisaged only in Poland's NECP, while Denmark is planning to terminate subsidies for incinerations. **Thermal energy storage** is mentioned only in the NECPs of Denmark and Lithuania as a flexibility solution. Measures for the development of **district cooling** infrastructure are in the initial phases of introduction in Lithuania and Denmark.

Table 2 Measures for integration of RES technologies in H&C and DH

	Denmark	Ireland	Latvia	Lithuania	Netherland	Poland	Sweden
Solar thermal	Technology neutral support schemes	N/A	N/A	Feasibility assessment	Operating aid (SDE ++)	N/A	For individual households
Heat pumps	Reducing electrical heating tax; support schemes	Yes –in 600,000 individual households	Yes	Feasibility assessment	Investment Grant for Sustainable Energy	Yes – individual households	Yes – in buildings that use electricity
Geothermal energy	Technology neutral support schemes	Within heat pumps support	N/A	N/A	Geothermal Master Heat Plan; SDE ++	Geothermal Energy Plus Fund	N/A
Biomass/biofuels	Technology neutral support schemes	Operating aid for biomass/ biogas boilers/CHP	Yes	Increasing biofuels transparency/sustainability criteria	Operating aid (SDE ++)	Main RES source in H&C/DH	Exempting/deducting energy tax
Waste heat	Special fund of 133 million DKK/year; lower electricity tax	Yes, from data centres	N/A	15% of potential to be taken by DH yearly	Yes, regions in charge; Operating aid (SDE ++)	Yes, from industry	Yes, within Klimatkliv program
District cooling	Removing administrative barriers	N/A	Yes	Assessment of the potential	Yes, in the industry	N/A	N/A
CHP	Subsidies for natural gas CPHs and incinerators are ceased	Operating aid for biomass/ biogas CHPs	Yes, in industry	Yes, new biofuel plants	Operating aid (SDE ++)	Development of new and converting existing plants into CHP	Exempting/deducting energy tax on biofuel CHPs
Thermal energy storage	Mentioned as a flexibility solution	N/A	N/A	Feasibility assessment	Operating aid (SDE ++)	Yes	N/A
Waste to energy	Subsidies for incinerators are ceased	N/A	N/A	N/A	N/A	Increasing utilisation of waste for energy	N/A

The NECPs of all EU Member States envisage some sort of investment aid (grants, loans) for different renewable-based technologies, while operating aid for the production of renewable heat is envisaged in the plans of Ireland, Poland and the Netherlands. Many countries are reviewing tax systems to support renewable-based heat generation.

Table 3 Financial instruments

	Denmark	Ireland	Latvia	Lithuania	Netherland	Poland	Sweden
Operating aid for renewable heat	N/A	Support Scheme for Renewable Heat (SSRH)	N/A	N/A	SDE ++, renewable heat	OPI&E and ROP, for renewable heat production	N/A
Investment aid	114 million DKK for biomass boilers, solar thermal and heat pumps	Support Scheme for Renewable Heat (SSRH), up to 30%	For storage systems and biomass installations	For new RES installations	Investment Grant for Sustainable Energy; Heat Fund	For new RES installations: grants, guarantee funds, repayable instruments	Up to 20% for hybrid solar electricity systems; Klimatkliv program
Tax exemption/reduction	Reducing electrical heating tax	N/A	Reviewing excise duties system and tax reliefs	N/A	Tax on gas will increase, and on electricity decrease	Tax relief on procuring material and equipment for thermo-modernisation of individual homes	Biofuel-based heat plants: exemption from energy and carbon tax

Concerning regulatory and administrative measures that are aimed to support the integration of renewable energy sources in the heating and cooling sector, the most significant is the ban on fossil fuel technologies (Ireland, Latvia and Netherland). Some countries are analysing and drafting new heating market and district heating policy frameworks and rules (Ireland, Latvia, Lithuania and Poland), especially with regards to enabling entrance of new market players, while Denmark has terminated the obligation of connection to the district heating network.

Table 4 Regulatory and administrative measures

	Denmark	Ireland	Latvia	Lithuania	Netherland	Poland	Sweden
Ban of fossil fuels	N/A	Ban of oil and gas boilers in new buildings, as of 2022/2025; phasing out in existing	Ban of combustion plants on solid or liquid fossil fuels	Eliminating fossil fuels from DH and restricting connection to gas network (alternative policy measure)	No new connections on gas network; existing to be replaced	N/A	N/A
Heating market policy	Yes, new market-based policy	Development of new policy framework for DH	Easing the conditions for the access of individual heat producers to DH	Enabling regulatory environment; Green heat certificates (alternative policy measure)	N/A	Changing heat market model; establishing rules on the purchase of RES heat	N/A
DH regulatory measures	Mandatory connection to DH is ceased	Development of new policy framework for DH	DH tariffs lower than alternative heating solutions	Enhancing transparency and competitiveness	N/A	DH tariff policy	N/A
Other measures	N/A	Experience sharing, for development of DH; Buildings regulations	N/A	Transparency in biofuel market; obliging municipalities to buy only green heat (alternative policy measure)	Local heat plans and regional strategies for energy transition	Certification of RES installers; Simplified procedures for RES heating investments	Participating in R&I activities in the heating and cooling field

All EU Member States have introduced some sort of measures for individual households, i.e. replacing obsolete and fossil-fuel based appliances with heat pumps and addressing that way excess emissions, or providing support for energy efficiency measures addressing poor insulation.

Table 5 Measures for individual heating

Denmark	Ireland	Latvia	Lithuania	Netherland	Poland	Sweden
Replacing oil burners with heat pumps	Ban on installing new oil and gas boilers/replacing existing with 600.000 heat pumps	Promoting self-production and self-consumption with zero-emissions technologies	Assessing current situation of decentralised heat supply (inventory of heating installations); By 2030, 50 000 domestic boilers will be replaced in households	Replacing natural gas appliances with heat pumps; Financing via Heat Fund	Thermo-modernisation (SMOG STOP and Clean Air investment program); Thermo-modernisation bonus	Deducting 9% of labour cost for installing solar heating systems; and up to 20% of investment costs

Denmark, Latvia, Lithuania, Poland and Sweden are Member States with well developed district heating systems. However, the role of district heating in energy decarbonisation is differently perceived in these countries, from placing it at the heart of the energy transition (i.e. Lithuania) to

not planning any particular measures for the development of this sector (Sweden). Ireland and the Netherlands are in the early stage of development of district heating networks. In the Netherlands, it is recognised as the solution for replacing fossil fuels in individual households, especially in urban dense areas, while Ireland is just launching the first two district heating systems with innovative technologies.

Table 6 Measures for DH infrastructure

	Denmark	Ireland	Latvia	Lithuania	Netherlands	Poland	Sweden
Modernisation of heat network	Replacing natural gas-based DH with heat pumps	N/A	EU structural funds: renovation of DH	Yes, upgrade of remote metering system	N/A	One of the strategic directions	N/A
New DH infrastructure	Assessment of the need for new infrastructure; energy communities	Climate Action Fund – building two DH systems; Assessment of DH potential	EU structural funds for new regional DH networks	Yes, for integrating of 200 MW of RES	Yes, to replace gas network	One of the strategic directions	Klimatkliv program
Connection to DH	Mandatory connection is ceased	N/A	Support for new connections (lower tariffs)	Financial support for new connection	Yes	70% of households connection to DH	N/A

10. Guidance for Contracting Parties

The Energy Community Contracting Parties are supposed to put forward in their NECP the trajectories, policies and measures that will meet the indicative target set out in Article 23 of Directive (EU) 2018/2001 of a 1.3 ppt annual increase of renewable energy sources in the heating and cooling sector. The **first step in setting trajectories and drafting measures for the development of the heating and cooling sector is the assessment of the current situation and determining the potential for the integration of renewable energy sources in the sector.** In describing the current situation, it is important to assess why the RES target for 2020 was not reached, if this is the case.

When determining the trajectories, countries need to be ambitious enough to contribute to the overall increase of renewable energy in final energy consumption. It is also necessary to determine **which technologies will contribute to the set trajectories**, and in which values. Since waste heat and cold can be taken into account when calculating the share of renewable energy in the sector, NECPs should contain information on waste heat in the trajectories.

To exploit the potential, **barriers to the deployment of renewable energy sources should be detected and addressed with appropriate policies and measures.** Measures could be of legal/policy nature, i.e. envisaging a ban on the use fossil fuels for heating purposes, or assessing the current potential of independent renewable heat producers to enter the market. The most important measures are those of financial nature in the form of investment aid, operating aid or tax relief. Those countries that heavily rely on fossil fuels in the heating sector should address this with significant financial support, including for individual households.

District heating in many countries is recognised as being the solution for the energy transition. With regards to the development of the district heating sector and cogeneration technologies, NECPs should **rely on the comprehensive assessment of the potential for high-efficiency cogeneration and efficient district heating**, as required under Article 14 of the Energy Efficiency Directive. Countries could assess the possibility of district heating providing flexibility solutions to the electricity sector, and thus enabling sector coupling. Finally, since district heating is of local character, it is advisable to **include municipalities or regional authorities in developing policies and measures for this sector.**