

ROADMAP			
TITLE OF THE INITIATIVE	Communication on an EU strategy for Heating and Cooling – the contribution from heating and cooling to realising the EU's energy and climate objectives		
LEAD DG – RESPONSIBLE UNIT – AP NUMBER	ENER – C3 – 2015/ENER/026	DATE OF ROADMAP	07/ 2015
LIKELY TYPE OF INITIATIVE	A Communication with a Staff Working Document		
INDICATIVE PLANNING	http://ec.europa.eu/atwork/pdf/planned_commission_initiatives_2015.pdf		
ADDITIONAL INFORMATION	https://ec.europa.eu/energy/en/topics/energy-efficiency/heating-and-cooling		
<p>This indicative roadmap is provided for information purposes only and can be subject to change. It does not prejudice the final decision of the Commission on whether this initiative will be pursued or on its final content and structure.</p>			

A. Context, Subsidiarity Check and Objectives

Context
<p>The EU medium and long-term energy and climate objectives, as established in the agreed 2020 and 2030 targets on GHG emissions, energy efficiency and renewable energy and the 2050 Energy Roadmap, require a steep reduction in energy consumption and moving towards the decarbonisation of the energy sector by 2050. Heating and cooling represent around half of the EU energy consumption. More than two thirds of heating and cooling (84%) is still generated from fossil fuels; only around 16% is generated from renewable energy. Therefore, the sectors' contribution is key to achieve the EU objectives on decarbonisation, demand reduction, security of supply and competitiveness. The Energy Union Communication of February 2015 (COM(2015)80) announced that increased efficiency gains with regard heating and cooling are a priority within the third dimension of the strategy dedicated to energy efficiency. In this context, the Commission announced a strategy on heating and cooling.</p> <p>Various EU instruments have relevance for heating and cooling as they provide for specific measures regulating or influencing heat consumption or production, but often only indirectly target heat. Cooling is even less the object of EU regulations. The main instrument is the Energy Efficiency Directive (EED), which requires Member States to carry out a comprehensive assessment and cost-benefit analyses of potentials for high-efficiency cogeneration and efficient district heating and cooling. The Energy Performance of Building Directive (EPBD) mandates setting requirements for the energy efficiency of buildings, including the reduction in buildings' thermal energy demand. The EU Ecodesign and Energy labelling framework addresses the efficiency of products covering also heating and cooling appliances and equipment. The Renewable Energy Directive includes the heat sector in the 2020 renewable energy target and promotes direct renewable energy use in buildings, or use of renewable energy through district heating and cooling as an instrument towards that target. The EU Emissions Trading System has established a linearly decreasing cap for emissions from the power and industry sectors. This covers most district heating installations and related emissions and indirectly also emissions from electric heating and cooling. The Effort Sharing Decision sets binding Member State targets for GHG emissions in sectors not covered by the ETS for 2020 and will continue to do so for 2030. The remaining majority of heating emissions, in particular from individual heating systems in buildings, are covered by this legislation.</p> <p>These instruments are limited in scope to sufficiently identify and address the role of heating and cooling, as a sector in the EU energy transition towards decarbonisation. A Commission Strategy on Heating and Cooling will inform and provide input to the review of some of the EU instruments described above, notably to the respective reviews of the Energy Efficiency Directive, the Energy Performance of Building Directive and the Renewables Energy Directive, which are expected to take place in 2016.</p> <p>In view of the strategic objectives for the EU to become the world leader on renewable energy and to have the "energy efficiency first" principle at the core of its energy policy, there is the need to fully harness the potential of the heating and cooling sector in proportion to the size and importance of heating and cooling in the EU economy.</p> <p>The mid-term evaluation of the regulatory fitness of the Renewable Energy Directive carried out in 2014 indicates that all articles of the Directive are relevant for its objective (increasing sustainably the share of renewable energy in the final energy consumption of the EU and its Member States) and that the Directive has been successful in meeting these objectives. Nevertheless, the level of effectiveness and efficiency of the measures laid down by the Renewable Energy Directive varies, depending on a number of factors, notably their</p>

implementation at Member State level. This assessment stands also for the specific measures on heating of the Renewable Energy Directive, in particular for Article 13, which has been implemented by Member States in different levels.

Overall, studies and evaluation conducted for the impact assessment for the 2014 Energy Efficiency Communication, the Renewable Energy Directive and the Energy Performance of Buildings Directive have to some extent also analysed the effectiveness of the existing policy framework for heat. However, the cost-effective analysis carried out in the Impact Assessment for the 2014 Energy Efficiency Communication did not focus on cost-effective solutions for heating and cooling. The results show that no sufficient progress is made in energy demand reduction, energy efficiency improvements and renewable penetration to ensure that the EU medium and long-term objectives are met, and the contribution of heat to the EU objectives remains limited and requires further and more in-depth investigations.

Issue

There is an insufficient understanding of the heating and cooling sector, as it has so far not been subject to a dedicated EU level assessment treating the sector as a whole. The energy saving potential of heating and cooling and the possible policies to mobilise the sector's contribution to the EU's energy and climate objectives has not been sufficiently assessed, nor is it harnessed.

Heating and cooling accounts for around half of the EU energy use and, according to the available scenarios, it will remain the largest energy demand driver also in the long-term. Due to its size and penetration, how heating and cooling is produced and consumed has a major impact on the EU economy and on whether the EU will be able to achieve its climate and energy goals by 2020 and 2030 on greenhouse gas emissions reduction, energy efficiency and renewable energy. In addition to the impact on medium term energy and climate goals in 2020 and 2030, the investments made today are going to have an impact also on the long-term EU decarbonisation goals up to 2050, given the average lifetime of heating technologies and their replacement rate (e.g. a gas/oil boiler employed for fulfilling space heating comfort needs in households could have a lifetime up to 25 years).

The sector is key to Europe's competitiveness, supply security, international trade position, jobs and the well-being of EU citizens. Heating and cooling is a major factor in social integration, the spending power and the poverty level of EU citizens.

Since heat and cool cannot be transported economically on a long distance, heating and cooling is produced and consumed locally. The heating or cooling market is fragmented and no single market has so far emerged either nationally or EU-wide. Instead, heat markets are local and are composed by many different technologies and economic players (vendors, installers and builders, engineering companies and energy advisors, energy utilities and energy service companies) selling the heat and cool as a commodity or service, often bundled with other services. Heating and cooling are closely linked with other energy markets, in particular the fuel and the electricity markets, but also with non-energy markets such as water, waste, real estate and technology.

The different pathways to achieve the energy saving potential of heating and cooling in buildings and industry, together with the barriers and drivers to the decarbonisation of heating and cooling demand and supply have not been sufficiently understood and assessed. Uncertainties remain as regards the role of heating and cooling in meeting the 2030 targets and its interaction with other sectors and other parts of the EU energy system. Current EU policy instruments only partially address the heating and cooling sector. Due to these gaps, policy tools and capacities are not sufficiently developed to drive the transformation of the sector, to maximise the use of potentials and deploy solutions for demand reduction and decarbonisation at the required scale and pace.

Subsidiarity check

In order to achieve the EU 2020, 2030 and 2050 energy and climate goals, it is appropriate for the EU to establish a common framework while leaving the responsibility and flexibility to the Member States to set in a transparent and comparable way the concrete modalities and actions for achieving their national goals in a cost-effective way. The Heating and Cooling Strategy is aimed at providing inputs and inform the on-going review of the relevant EU legislation in the area of climate and energy, and therefore within this framework the principle of subsidiarity is respected.

Despite of its energy-related importance to achieve the EU 2020, 2030 and 2050 energy and climate goals and magnitude (49% of energy consumed in the EU in 2012), there is surprisingly little information about heating and cooling as a sector and no EU level framework exists to drive the mobilisation of heating and cooling potentials towards common EU level goals. The analysis which will underpin the Heating and Cooling Strategy will be based on an assessment of existing knowledge from different sources as well as ad-hoc studies, which will as

much as possible highlight best practices at country level as well as cross-country issues (e.g. on technology and innovation trends). An EU initiative on heating and cooling has therefore the value-added of bringing together dispersed and incomplete information, thus providing a valuable basis for an EU framework and for Member States. Such analysis of cross-cutting issues (e.g. on technology and innovation trends), and of the overall synergies within the energy system (e.g. with the electricity market) cannot be sufficiently appraised at Member States level.

Main policy objectives

The Strategy for Heating and Cooling is aimed at informing and providing inputs to the ongoing review of relevant EU legislation, which has an impact on the supply and use of heating and cooling, and on the assessment of the role and contribution of this sector in achieving the EU energy and climate goals. The Communication will assess the potential of the sector to contribute to the EU's strategic climate and energy objectives. An accompanying staff working document will provide a useful and factual analytical base for use in this initiative and related future initiatives. It will fill gaps in understanding, identify possible shortcomings in the existing regulatory framework, ways to mobilise unused potentials and synergies with other sectors and policy instruments.

The Communication aims to set out broad areas for further work that would be subject to more detailed assessment in the context of future legislative reviews and proposals under the Energy Union Strategic Framework, in particular those related to the Energy Efficiency Directive, the Energy Performance of Buildings Directive and the Renewable Energy Directive. It will help prioritise heat as a policy area for energy efficiency in the energy sector; facilitate a better informed debate on the role of heat in increasing the EU's energy efficiency, energy demand reduction and the decarbonisation of the energy sector; and aim to build consensus on policies and actions ensuring the heat sector's contribution to EU energy efficiency and decarbonisation objectives.

The Communication will be based on a comprehensive analysis of the heating and cooling sector in an accompanying staff working document. This analysis will include the contribution of the sector to EU energy demand, the potential of different technologies and fuels and the role of the sector in long-term decarbonisation scenarios.

Through helping achieve the EU energy and climate goals, the heating and cooling sector has the potential to provide a decisive contribution to improve its citizens' well-being, the competitiveness of its industries, the continued and strengthened EU technological leadership in clean environmental technologies

B. Option Mapping

The Heating and Cooling Strategy will appraise the magnitude of change needed in the heating and cooling sector by 2030 and 2050 and identify synergies that can widen energy efficiency and decarbonisation potentials while reducing the costs of implementing the change. It will provide a comprehensive overview of the sector's current situation and appraise possible pathways and instruments to make heating and cooling contribute proportionately to the EU energy transition. The Strategy will highlight areas where better synergies between current EU instruments could be exploited or EU and national policy and regulatory frameworks would need to be complemented to allow driving actions by stakeholders and Member States.

The Strategy will focus on identifying possible options, including 1) to strengthen synergies between energy saving measures at building level and district level to widen access to energy efficient, low-cost renewable and low-carbon energy supply; 2) linking heating and cooling with electricity systems to allow increased optimisation, efficiencies and the integration of renewable energy sources through demand response, thermal storage, and smart electric and thermal grids; 3) linking buildings with waste heat sources from industries; 4) cost-effective balancing of on-site and off-site energy efficiency and renewable deployment measures in buildings and industry; 5) integrated planning and mapping by Member States and municipalities; 6) better coordination instruments among national authorities, companies and consumers; 7) instruments facilitating the broader deployment of existing technologies, such as information transparency, access to expert advice, installers' training, and best-practice sharing; 8) instruments to facilitate industry buy-in through best practice sharing, research, development and demonstration for heating and cooling; 9) further improved use of EU and public funds for investment in buildings, industry and energy infrastructures.

The Strategy will compile a wide range of policy options, take stock of the possible instruments and provide an initial appraisal of their viability through best practice examples, the results of available studies at EU and national levels, and literature review. It is not aimed at selecting any particular options, but to provide a menu of possible pathways and instruments that can inform further debate and relevant legislative and non-legislative initiatives under the Energy Union Strategy. The Heating and Cooling Strategy will not propose concrete measures or targets, but will aim at indicating possible policy directions and elements for future initiatives.

Proportionality check
<p>The challenge and the goals the Heating and Cooling Strategy will address are EU wide and global: climate change, decarbonisation, bringing to markets new energy efficient and renewable technologies, increasing competitiveness and security of supply, reducing the costs of the energy transition to consumers, industry and the society. The Strategy aims at informing EU and national policies and providing an overarching frame that can help Member States to cope with global challenges affecting their national economies, while at the same time contributing to common EU-wide and global goals. The goals cannot be reached by Member States alone. The Strategy will not affect Member States' freedom to act, but will provide a menu of options and instruments Member States can use when defining concrete measures that best fit their national conditions and capabilities. The Strategy will allow providing policy directions to create synergies, reduce costs, and alleviate individual Member States' burden. The Strategy will point out possible policy and financial instruments that can help Member States implement the most cost-effective and sustainable measures and actions.</p>
C. Data collection and Better Regulation instruments
Data collection
<p>A series of relevant studies, modelling and impact assessments were carried out under the <i>EU 2050 Low-carbon Economy Roadmap</i> (COM(2011)112, 8.3.2011; SEC(2011)287, 288, 289), the <i>EU 2050 Energy Roadmap</i> (COM(2011)885, 15.12.2011; SEC(2011)1565); the <i>2030 Energy and Climate Framework</i> (COM(2014)15, 22.1.2014. SWD(2014)15) and the <i>2014 Communication on Energy Efficiency</i> (COM(2014)520, 23.7.2014; SWD(2014)255).</p> <p>The background studies and the impact assessment for the <i>Proposal for a Directive on energy efficiency</i> also provide relevant evidence base for heating and cooling (SEC(2011)779, 22.6.2011).</p> <p>Past, recent and on-going studies under the Renewable Energy Directive (e.g. <i>Renewable Progress Report</i> COM(2015)293, 15.6.2015) and its review (e.g. <i>CE Delft Mid-term evaluation of the Renewable Energy Directive</i>, April 2015; Ecofys, <i>Biofuels Sustainability</i>, 10.10.2014, ENER/C1/428-2012), the Energy Performance of Buildings Directive (EPBD) (Ecofys, <i>Towards nearly-zero energy buildings</i>, Project BESDE10788, 14.2.2013) and its review (<i>Assessment of cost-optimal calculations in the context of the EPBD</i>, April 2015) will also be used.</p> <p>Further evidence base includes studies and reports prepared by the Commission's Joint Research Centre on a number of relevant issues, such as cogeneration and generation technologies and for the implementation of the Energy Efficiency Directive (e.g. <i>Report on EU-27 District Heating and Cooling Potentials, Barriers, Best Practice and Measures of Promotion</i>, 2012; <i>Heat and cooling demand and market perspective</i>, 2012; <i>Best available technologies for the heat and cooling market in the European Union</i>, 2012 available at https://setis.ec.europa.eu/publications/jrc-setis-reports) and the Energy Performance of Buildings Directive.</p> <p>A number of impact assessments (for <i>Regulation 813/2013/EU on space heaters and combination heaters</i>, SWD(2013)297) and studies under the Ecodesign Directive (e.g. <i>Average EU building heat load for HVAC equipment</i>, ENER/C3/412-2010/15/FV2014-558; <i>Ecodesign Impact Accounting</i>, 30.05.2014, ENER/C3/412-2010) provide information on energy consumption and technologies for heating and cooling.</p> <p>Several reports commissioned from external consultants by DG Energy and other services will provide relevant and dedicated analysis, for example on energy used to produce and consume heat (<i>Mapping and analyses of the current and future (2020 - 2030) heating/cooling fuel deployment (fossil/renewables)</i> ENER/C2/2014-641), on possible fuel and technology mixes for an efficient and decarbonised heating and cooling sector in 2050 (Aalborg University, ENER/C3/2014-557), energy efficiency potentials in industry (ICF, <i>Study on Energy Efficiency and Energy Savings Potentials in Industry</i> ENER/C3/2012-439).</p> <p>Relevant materials gathered under FP7 and Horizon 2020 projects, such as Stratego, No: IEE/13/650 will be used.</p> <p>Studies, modelling and reports prepared under national climate, decarbonisation and energy efficiency strategies will be gathered and reviewed to inform the Strategy.</p> <p>Materials, such as market analysis and reports from a wide range of EU associations in the renewable energy sector, the wider heating and cooling industry, the building and the energy supply sector and various energy intensive and other industries.</p> <p>Publication by international organisations, in particular IEA (<i>Capturing the Multiple Benefits of Energy Efficiency</i>, 2014; <i>Linking Heat and Electricity Systems</i>, 2014), OECD (e.g. <i>Energy Technology Perspectives</i>, 2015) and UNEP (e.g. <i>District Energy in Cities, Unlocking the Potential of Energy Efficiency and Renewable Energy</i>, 2015) will form part of the evidence base, as well as publications, studies from academia and consultancies.</p> <p>The information gathered from the various sector stakeholders will be cross-assessed and triangulated to avoid</p>

bias. The Strategy will list a comprehensive set of evidence and references.
Consultation approach
<p>The Strategy will address all stakeholders involved in heating and cooling: Member States, other EU-institutions, energy sector companies, technology and solution providers, consumers, industry and academia.</p> <p>Public consultation started with the Commission’s Heating and Cooling Conference on 25-27 February 2015. The Sustainable Energy Week continued this consultation process with the policy session organised on 18 June, entitled “Tapping the Potentials in the Building and the Heating and Cooling Sectors – Review of the Energy Performance of Buildings Directive and an EU Strategy on Heating and Cooling” based on a set of targeted questions. A dedicated Consultation Forum will convene all involved stakeholders in early September based on a set of issues papers and questions on no-regret options. It will explore stakeholder views, ideas and opinions on the list of options with the aim of mapping completeness, triangulate evidences and calibrate the focus.</p>
Will an Implementation plan be established?
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <p>No concrete action or measure will be proposed.</p>
Will an impact assessment be carried out for this initiative and/or possible follow-up initiatives?
<p>No IA will be carried out. The Communication will not propose any new policies but identify areas for further work, which could be developed further in the context of upcoming reviews of the Energy Efficiency Directive, the Energy Performance of Buildings Directive and the Renewables Directive.</p>