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EU will fail Paris climate challenge unless it tackles heating and cooling

The European Union’s fight against global warming is doomed to fail unless decisive action is taken to change the way we heat and cool our buildings.

Under the landmark United Nations Paris Agreement, the EU is committed to curbing worldwide temperatures at no more than two degrees above pre-industrial levels.

The heating and cooling systems used in buildings and in industry demand special attention from national and European policymakers mindful of the promises they made in Paris.

Although the pact, signed by 195 nations, was weakened by US President Donald Trump’s decision to pull out, that has only made the EU more determined to take on the mantle of global climate leaders.

Heating and cooling of buildings and industry is responsible for half of the EU’s energy consumption, and, according to the European Commission, “much of it is wasted”.

In EU households, for example, heating and hot water make up about 79% of energy use. On average, Europeans spend 6% of their expenditure on heating and cooling. 84% of heating and cooling is still powered by polluting fossil fuels, which heaps greater pressure on the EU’s carbon limits. Nearly half of the energy used comes from burning gas.

While cooling is a relatively small proportion of energy use, it is increasing. Ironically it is increasing because of the greater temperatures caused by global warming.

“In order to fulfill the EU’s climate and energy goals, the heating and cooling sector must sharply reduce its energy consumption and cut its use of fossil fuels,” the European Commission says.

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Only 16% of heating and cooling power across the EU comes from clean renewable energy. But since Paris, the share of renewables on the EU energy market has increased.

The bloc’s 2030 climate and energy goals aim to cut emissions by at least 40%, and boost renewables and energy efficiency by at least 27%.

The goals, struck relative to 1990 levels, were the basis of the bloc’s negotiating position at the Paris climate talks.

After the success of the Paris Agreement, those targets are currently under negotiation by EU lawmakers with a view to making them more robust.

The Renewable Energy Directive is currently being amended in the European Parliament. Lead MEP on the bill Spanish Socialist José Blanco López (S&D), has called for it to be strengthened to at least 35%.

He also demands that the targets are made binding as the 2020 goals were. In 2014, EU leaders, jealous of the sovereignty over their own energy mix, were opposed to binding targets being set at national level.

But those binding targets are also credited with helping to drive the EU’s shift away from fossil fuels. In 2016, almost 90% of new power in Europe came from renewable sources. Wind overtook coal as the second largest form of capacity.

The report will form the basis of the Parliament’s negotiating position with the Commission and Council. If it results in increasing the obligation to boost renewables, then national governments will be further incentivised to look at heating and cooling.

Acting on the decarbonisation of the heating and cooling sectors will not only cut emissions but also provide greater demand for renewables, incentivising a greater share of clean energy on the market.

HEATING AND COOLING STRATEGY

In February 2016, the Commission launched the first ever EU decarbonisation strategy for the heating and cooling sector.

It does not put forward hard rules for member states to transpose into national law. However, such communications are frequently followed up by binding legislation from Brussels.

The Commission says that the strategy is a key part of the flagship Energy Union plan, which aims to slash both emissions and the EU’s dependence on imports.

“Developing a strategy to make heating and cooling more efficient and sustainable is a priority for the Energy Union,” the Commission said in its communication on the issue.

The Energy Union strategy has targeted the renovation of the EU’s building stock to meet its twin goals.

Two thirds of the EU’s buildings were built before energy efficiency requirements were introduced or were at a very early stage. As result, 75% of the bloc’s buildings are inefficient, which leads to waste, greater energy consumption and so higher carbon emissions, the Commission argues.

European Commission research has found that most of these buildings would still be standing in 2050, which strengthens the arguments for energy efficient renovation.

The EU wants to reduce greenhouse gas emissions by 80% to 95%, compared to 1990 levels, by 2050.

Experts argue that waves of energy efficient renovation across Europe could give the economy a much-needed fillip, as well increase the value of homes and reduce energy poverty. Despite that, the annual rate of building renovation across the EU is a sluggish 1%.

Inefficient buildings lose heat more quickly and are more difficult to cool. Much can be done to boost the energy efficiency of buildings and reduce consumption through technology such as smart meters, double glazing and insulation.

Introducing a new heating or cooling system is a major investment but can be cheaper if planned as part of a stage of wider renovations.

The renovation is an opportunity to shift away from gas to technology such as heat pumps, geothermal heating or waste heat.

Heating and cooling technology businesses, such as Danfoss, insist that the technology to decarbonise the sector exists. All that is missing is the policy.

European Parliament lawmakers are currently debating how best to use the draft revised Energy Performance in Buildings Directive to convince homeowners to plan such renovations.

Almost half of the EU’s buildings have individual boilers installed before 1992, with efficiency of 50% or less, according to the Commission.

WINTER PACKAGE

The EU is currently revising three directives that could help drive more renewable-based and efficient heating and cooling systems in Europe.


The three bills were put forward in the Commission’s gigantic winter package earlier this year. All are currently being amended and negotiated by MEPs and the EU’s member states.

They can only become law when both Parliament and Council agree an identical text so there is still plenty of horsetrading ahead both between the member states themselves and the institutions.

The lead MEP on the EPBD, the

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Danish Christian Democrat Bendt Bendtsen (EPP), is understood to favour incentivising the pickup of building logbooks to improve renovation planning.

The Commission has pushed for ways to accelerate the replacement of obsolete fossil fuel boilers, and increase renewable energy deployment in district heating.

The existing Energy Efficiency Directive requires national governments to set our action plans to reduce heating and cooling demand, as well as national building renovation strategies.

However, such initiatives have been dogged by poor implementation at national level with numerous infringement proceedings being launched against laggardly member states.

Despite that, Energy Union chief Maroš Šefčovič has said that the Paris Agreement would mean that member states would finally live up to their responsibilities.

But with huge variances in culture, building stock, political will and even temperature across the EU, policymakers face a huge challenge.

This week’s special report will investigate different ways policymakers and other stakeholders are looking to meet the tricky challenge of decarbonising the sector.
The lack of effective EU legislation for the decarbonisation of Europe’s heating and cooling systems is a “real failure” that puts the bloc’s climate goals at risk, Maarten De Groote, the head of research at the Buildings Performance Institute Europe, has warned.

Maarten De Groote is head of research at the Buildings Performance Institute Europe (BPIE). The BPIE is an independent think tank focused on the energy performance of buildings.

De Groote spoke to EURACTIV.com’s James Crisp.

Why is it important to boost renewables in heating and cooling?

Well, first of all, heating and cooling represent over half of Europe’s energy demand, and currently the increase of renewables in the sector is more driven by electrification, while for heating we still rely a lot on other fossil fuel sources.

What are the barriers to renewables getting into the system?

Heating and cooling systems are more decentralised and locally installed, which is more challenging to approach through a system transition. For instance, individual buildings have mostly their own heating systems, so the switch to renewable solutions such as heat pumps or solar thermal installations depends on the building owner’s choice. For district heating systems – providing 9% of EU’s heating – there is the challenge that many of them are very old and inefficient, using conventional, polluting energy sources.

Where does the switch take place? At the supply side? Do consumers have

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Yes absolutely. The situation in industry and in housing is very different.

Let’s concentrate on housing.

More than half of the total heating demand in Europe goes to heating buildings, and in colder climates it accounts for even more than 80%.

That’s a lot. So if the EU doesn’t get to grips with this, does it risk missing out on its climate goals?

Definitely. And it is not being addressed sufficiently. To decarbonise the European heat demand, you need to do two things. First you need to decrease demand drastically, according to the EU project Heat Roadmap Europe, there is a 30% to 50% cost-efficient heat reduction potential. Other studies find even higher savings potential (of over 70%) across the European building stock.

Then you have to make your supply side sustainable and efficient. On the supply side, there are two levels – one is for individual buildings, and the other is for larger areas focusing on strategies for district heating.

On the individual level, if you want to decarbonise, you basically have to switch to heat pumps which can combine renewable electricity with efficient renewable heat production. However, this only makes sense if the building shell is also very efficient.

As the building stock should deliver at least 80% CO2 emission cuts, the answer is clear. With 75 to 90% of the current building stock still standing in 2050, we need to increase our efforts significantly to meet the Paris Agreement goals.

The European Commission’s recent winter package backed this collective approach but beyond that call, what has the EU actually done?

Unfortunately, the momentum to renovate our buildings is far too sluggish, and the Commission’s proposal for the revised Energy Performance of Buildings Directive (EPBD) lacks ambition and misses the opportunity to trigger more renovation activities. In the current discussions, the European Parliament is the only progressive voice, while many member states are doing their best to reduce ambition. That’s a real failure.

Can the European Parliament amend the legislation?

Bendt Bendtsen, the EP rapporteur for the EPBD revision, is working on significant improvements of the proposal. One of the major instruments is the renovation strategy. If you want to have a sustainable and renewable heating and cooling system, you need to renovate your building stock. Many MEPs support this.

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Today, when building owners have to replace their heating system, they are taking a decision under time pressure, as it is mostly only considered when it has broken down. If it is -10 degrees outside, you want the system replaced the next day. So, people decide to stay with their conventional heating system, as they do not have sufficient knowledge about alternatives.

What I expect to be proposed is the introduction of a building renovation passport, which is a long-term roadmap tailored to a specific building, outlining relevant measures that would achieve the deep renovation. This allows you to already have a plan in place to replace your old system with a low-carbon system. Such an individual building renovation passport allows the owner to avoid a lock-in effect.

**Because if you buy a new conventional heating system you will likely stick with it until it is broken.**

Yes, as it is a big investment. Therefore, we need to ensure that citizens have the right information about solutions which are future-proof and climate-friendly.

**How difficult is it for a consumer to get a renewable heating and cooling system?**

It depends on the country. If you take an individual house, the installers have a crucial role to play. They need to inform their clients. And they need to have the expertise to do that.

**So even if the Commission wants to decarbonise heating and cooling, it hasn’t proposed the hard legislation to follow that.**

Exactly. The Commission’s proposal does too little for the renovation of existing buildings.

There are trigger points in the life-cycle of a building, such as a system failure or when it is sold or rented, where effective legislation could lead to a deep renovation of the building.

**So why hasn’t it happened? A lack of will from member states? Lobbying from gas companies?**

What I understand is that the Eurosceptical atmosphere dominating in 2016 meant the Commission did not want to be perceived as too prescriptive, as it would be pushed back by member states anyway. This is despite the fact that some countries are implementing effective measures and that the much-needed momentum for renovation will actually bring real benefits to European citizens.

**Previous versions of the EPBD were not properly implemented by member states. They have basically been a failure, haven’t they?**

Weak implementation is indeed a problem, but the EPBD is not a failure. In the past, countries like Denmark and Germany were taking a frontrunner role, but the EPBD triggered action in many other member states. Some aspects included in the previous EPBD do make a difference, like the minimum energy performance requirements or the implementation of nearly-Zero-Energy Buildings. What is remarkable, however, is that with the discussion of the Clean Energy Package I don’t see any country taking a frontrunner role.

**What needs to change? What are the three things you would make policymakers do to drive decarbonisation?**

One would be stricter follow-up on implementation across all the directives.

Second would be a mix of guidelines and obligations to really increase the rate and depth of renovations.

Finally, integrating buildings and energy systems. Transforming buildings from being individual units to becoming highly-efficient micro energy-hubs, leading to a decarbonised and more flexible, resilient and efficient heating and cooling system by saving energy as well as producing, storing and supplying it.
In a possible nod to industry demands, the EU’s new energy label regulations will allow a 10-year transition period for heaters until 2030, a move likely to confuse consumers, hinder innovation in clean technology and extend the market life of fossil-fuelled devices, critics said.

As part of an energy label reform approved in Parliament last week, A-G stickers for televisions, lamps, washing machines, fridges and dishwashers will from 2020 replace the current system that has the potentially confusing A+, A++ and A+++ ratings. That part was welcomed by energy, consumer and environment groups.

For products like air-conditioners, tumble dryers, vacuum cleaners, ovens, range hoods, and residential ventilation units, old and new labels will co-exist between 2021 and 2025, when the old ones will be discontinued. So far, so good.

NEW LABELS FOR HEATERS AS OF... 2030

The sticking point – on which the industry and consumer groups, but also some MEPs, differ – revolves around heating products, for which the new labels do not need to be introduced before 2030.

“The rescaling of energy labels for heating products is indeed delayed far too far in the future. This is a move that protects fossil fuel boilers (condensing boilers) as they can remain A and green for a long time,” said Stéphane Arditi from the European Environmental Bureau (EEB) in Brussels, a network of green NGOs.

In practice, it means that ten years from now, shops will be selling A-class heaters (still under the old labelling scheme) side by side with A-class washing machines, but the two As will not denote the same level of energy efficiency.

“Consumers buying an A space heater will in fact be buying the fourth-ranked class from the scale going from D to A+++, while the A class will be the top class for the washing machine,” Arditi explained.

Old fossil fuel-fired boilers could misleadingly continue to be labelled as ‘A’ and green beyond 2030, undermining efforts to decarbonise the EU economy by 2050, EEB said. The EU has committed to cutting greenhouse gas emissions to 80% below 1990 levels by 2050.

INDUSTRY LOBBYING

Martina Werner, a German SPD lawmaker from the Socialists & Democrats (S&D) group in the European Parliament, was a shadow rapporteur for the label reform legislation. She said some member states had strongly lobbied in the Council and “were successful in hindering a quicker change to unified labels”.

“Ideally, new labels should have been introduced for all product groups at the same time,” Werner said. The lobbying member states had originally pushed for “up to 15 years for new labels to be introduced,” she said.

Sylvia Maurer, a policy director at the
European consumer organisation BEUC, noted that the industry was always seeking to water down strict legislative proposals.

“What we don’t need is that industry constantly tries to put features in the energy efficiency calculation formula that only serve their own interest,” she opined.

“For instance, when manufacturers ask to exempt certain energy-consuming functions from the calculation, it diverts efforts from reaching the goals of energy efficiency and cost savings for consumers.”

The CECED, a trade group representing European manufacturers of home appliance equipment, responded to critics, saying rescaling was more complex than might seem to an outsider.

"Each rescaling creates the potential for confusion among consumers and market surveillance authorities". Referring to the transitional period when both old and new labels will be used, it said:

“In case the new label relies on a new measurement standard (which will definitively be the case for dishwashers and fridges), applying a new label on old appliances means the effort of re-testing. In addition, market surveillance authorities will have to check compliance against both the old and the new legislation.”

“As the capacity for testing in European laboratories is limited, it is materially impossible to reliably have the double capacity needed for a temporary period of time. Testing can take up to several weeks for each individual product. In addition, there are only a limited number of specialised testing laboratories that are capable of carrying out the tests.”

### HEATING PLAYS A MAJOR ROLE IN CO2, ENERGY CONSUMPTION

Household appliances are a big and lucrative market. According to the CECEL, European turnover in 2014 stood at a hefty €43.7 billion, though still well below the pre-crisis level of €52.4 billion in 2008. The sector employed more than 200,000 people in 2013, more than 3% of EU’s total manufacturing employment.

But some appliances, particularly heating systems, are also responsible for a surprisingly high share of the continent’s CO2 emissions.

“Incredibly, Europe’s heating equipment is responsible for 25% of the continent’s CO2 emissions, around the same level as road transport or industry. Heating is by far the largest source of energy consumption in our homes,” Coolproducts – a grouping of European NGOs dealing with ecodesign and energy labelling – said on its website.

Furthermore, heating and cooling systems – many of which still use fossil fuels – account for a half of the EU’s total energy consumption. “And much of it is wasted,” the Commission said in its Strategy on Heating and Cooling.

The BEUC’s Maurer said the ten-year transition for heaters was likely to stymie innovation efforts.

“If decision makers now freeze the energy label face-lifting for ten years, even those manufacturers who produce the most energy-efficient products have no incentive to innovate further because their products will anyway stay in the top class. This is detrimental to market development.”

### REAL-LIFE EMISSION TESTS?

Data from CECED shows that manufacturers have long been aware of the energy labels’ potential, particularly for white appliances. Out of the total number of washing machines put on the market in 2013, six million were rated A++, 3.8 million A++ and virtually none rated A or lower.

However, in a report based on a comprehensive EU product survey and released on 20 June, Coolproducts said many household appliances were found to use much more energy than advertised on their energy labels, when tested in more ‘real life’ conditions.

This was due to unrealistic, dated and selective testing methods used for determining energy classes, which rarely took into account technological progress and new features on many appliances.

“TVs, for example, are tested with a video clip from 2007 that does not reflect typical home viewing or increasingly common TV technologies. Tests with a modern video clip in a higher quality format saw one model consume double the power,” the report said.

For Coolproducts, this suggests similar tricks could apply for heating and cooling systems. Some politicians even draw parallels with the Volkswagen emissions scandal which saw the German car company pay hefty compensation fines for cheating emissions tests.

Martina Werner said the issue of possible compensation for wrongly-labelled goods was not yet tackled, as the European Commission and the member states were “still struggling with the consequences of the emission scandal in the car industry”.

“Allowing for consumer compensation for wrongly labelled energy-related products would have created a huge precedent – too dangerous for both sides,” she pointed out.

However, she stated that the executive had heeded a call from the S&D and promised to present a legislative proposal that would address the issue later this year.

A Commission spokeswoman said the freshly adopted energy label legislation “contains clear language about the need for test methods to simulate real-life usage of products as far as possible.”

“Moreover, the text contains clear obligations for suppliers as regards the use of ‘defeat devices’ (which is forbidden) and the need to inform consumers about possible detrimental effects of software updates on the energy performance of the product,” the spokeswoman said.
In our modern society, cooling is a necessity that has a strong influence on health, productivity at work, cutting down food loss, industrial processes, and more. Keeping ourselves cool, sustainably, means we could keep the planet cool too, writes Jürgen Fischer.

Jürgen Fischer is president of Danfoss Cooling Segment.

Can you imagine a world without cooling? Have you opened your fridge today to take out fresh cold milk for your morning cereals or coffee? This wouldn’t be possible without cooling technology.

As technology advances and global population grows, the need for cooling is expected to increase exponentially.

The European Commission expects the demand for space cooling in the EU to rise by 70% by 2030. By 2060, the cooling sector is expected to outpace the heating sector and overtake it by 60% at the end of the century.

Cooling demand will also increase as our society becomes more digitised. Almost half of a data centre’s electricity is used for cooling and data centre power consumption nearly quadrupled to 43GW between 2007 and 2013 – an amount equal to the generating capacity of South Africa.

It’s crucial that we lead the way towards a sustainable cooling sector. We are one week ahead of the adoption of the general approach of the Council on the Energy Efficiency Directive and the Energy Performance of Buildings Directive. This is an important milestone on the journey to achieve the full decarbonisation of the cooling sector.

For me, the upcoming regulatory framework must shape our sector in five ways:

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1. RAISE AWARENESS ABOUT THE ENERGY SAVING POTENTIAL OF COOLING WITH THE CONSUMER IN FOCUS

We underestimate the importance of cooling for the moderate European climate. The refrigerator and freezer, appliances found in nearly every modern home, are responsible for the single biggest cooling energy load. In the UK, they consume 4% of all electricity—up to 13 TWh per year.

Refrigeration doesn’t stop in the home. Supermarkets currently use up to 2% of a country’s electricity. 70% of our foods are chilled or frozen when produced and another 50% are displayed in a refrigerator at the point of retail. Online food retail and the delivery of food to the consumer’s doorstep is projected to grow from 10% to 40% by 2027, increasing the use of refrigerated vans.

2. REDUCE BUILDING-LEVEL COOLING DEMAND WHILE ENSURING INDOOR COMFORT

Large buildings, particularly office buildings and hospitals, would be uninhabitable without air-conditioning. The Energy Performance of Buildings Directive and the Energy Efficiency Directive must therefore be two sources to consider for the decarbonisation of the building stock by 2050 (new Article 2a). Major renovation requirements and nearly-zero energy buildings will call for better ventilation and, to a certain extent, more air-conditioning as buildings become better insulated.

More efficient appliances, solar shading, and window technology can alleviate this demand to a certain extent, but we must also seek to integrate cooling technology with renewable energy sources.

3. ENABLE THE COOLING SECTOR TO ACCELERATE THE UPTAKE OF RENEWABLE ENERGY

Driven by the 2030 climate and energy framework, 45% of electricity will be generated by renewable sources, creating the need for better energy storage and increased demand-side management. With a favorable policy environment, cooling technology can support this goal. The growing role of heat pumps is yet another way to integrate excess renewable energy capacity that needs to be further incentivised by policy.

District cooling can be the enabler to integrate excess cooling capacity and provide free cooling via lakes and natural water bodies. If we combine systems, we will find the most energy efficient solutions.

4. ADVANCE SECTOR COUPLING AND SYSTEM THINKING

Integrating heating and cooling sectors can deliver huge efficiency gains. For example, the recovery of unavoidable waste heat in supermarkets, enabled by smart buildings, can be another target area for policy. In a case study in Denmark, the heating bill of a local supermarket was reduced by 80% using heat recovery and sending the heat generated by the cooling system of the store back into the district heating network.

System thinking must be front and center. It’s possible to integrate supermarkets into the larger energy system and unlock excess capacities that amount to 70% of a compressor’s cooling capacity—which can then be made available during energy peak demand.

The technology exists – however, policy needs to encourage innovation and incentivise the required investments. Currently, several member states discourage this innovation via double taxation of heat.

5. IMPLEMENT DIGITALISATION AS AN ENabler FOR More SUSTAINABLE COOLING

Digitalisation can be the game changer for the sector. We can already see that big data and analytics allow us to apply technology in a more intelligent way, leverage efficiency gains, and access cooling capacities that were underutilized before.

Currently, 9% of produced food in the EU is lost due to lack of adequate refrigeration. Monitoring software that tracks the temperature and humidity along the cold chain can significantly reduce food loss and reduce the sector’s energy and water use. Policies to encourage energy efficient and sufficiently monitored supply chains must therefore be another focus point in the EU.

The first steps to raise awareness and explain the importance of cooling for European citizens were taken this week at the CoolingEU launch event as part of the EU Sustainable Energy Week. This initiative kicks off a movement of industries working together across district energy, heating, cooling, ventilation and air conditioning to wake the sleeping giant of sustainable cooling.

Let’s make one thing very clear – cooling is not luxury – it is an essential part of our modern society. And if we manage to do it sustainably, we will also keep the planet cool.
Stockholm mayor: ‘Fuel poverty is non-existent in Nordic countries’

Nordic countries have relegated fuel poverty to the history books by setting legal minimum standards for heating and giving house-owners a strong incentive to invest in refurbishment, says the mayor of the Swedish capital.

Karin Wanngård has been mayor of Stockholm since 2014. She responded in writing to questions from EURACTIV’s publisher and editor, Frédéric Simon.

Heating and, to a lesser extent, cooling currently account for half of the EU’s annual energy consumption. What can European cities do to encourage a switch to cleaner technologies?

As a first step cities can start using sustainable biomass and waste that can no longer be recycled in the existing coal-fired power plants. Also, in many places today 60-70% energy used in electricity production is lost. By localising heat-demanding factories in the vicinity of the power plant this can be lowered considerably as they can use the excess heat.

If existing district heating grids are updated and expanded to modern smart grids, waste heat streams from industries or cooling of computer server halls and grocery stores can also be used for heating, resulting in even less energy waste.

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The price of solar panels has gone down tremendously over the years. Companies like Tesla are now bringing solar tiles to consumers for a price they claim is competitive. Does the future of heating lie in solar?

Since the demand for heat is at its peak when solar panels don’t deliver, i.e. during nights and in winter time, using solar panels alone would need extensive investments in seasonal storing capacity. This would also mean large amounts of the energy being lost in the transformation process and in order to use this waste heat you would still need a district heating grid.

One smart solution is a combination of heat and power plants, using renewable fuels and waste, producing heat and also electricity to balance the periodic electricity production from solar and wind, together with a district heating grid to move waste heat from excess areas to where it is needed.

Biomass is still widely used in some countries but its use can be controversial. Paris for instance recently banned wood for heating to address air pollution issues. So does biomass still have a place in people’s homes?

Sustainable biomass is a crucial part of the fossil-free energy system. Together with waste heat this is one of the few available alternatives for heating Europe and it is a key component for Stockholm to reach the goal of being free of fossil fuels in 2040.

The problem for air quality is not biomass but boilers without cleaning. Air quality will suffer regardless if you burn biomass, coal, oil or natural gas in boilers without cleaning. Stockholm has substituted about 100,000 oil and coal chimneys without cleaning, with less than 10 big chimneys, burning biomass and waste, using state-of-the-art exhaust cleaning and continuous monitoring of emissions. This has reduced air pollution substantially. The air quality in Stockholm is 100 times better than before and simultaneously about 1,000 fuel delivery trucks (10% of the trucks) are no longer needed in our streets.

Substituting fossil fuels with biomass and waste energy, together with a high storage of carbon in growing forest, gives both a storm- and fireproof carbon storage and extensive replacement of fossil fuels. This is an everlasting method with far better climate performance, than the one-off method of letting the forest be unused until it stops storing carbon and becomes very vulnerable to storms and wildfires.

District heating systems are often cited as an example of efficient heating systems for cities. They are now commonplace in Nordic countries and were widely installed in Eastern Europe during the communist days. But they also require heavy infrastructure investments. Is this a technology of the past or of the future?

The potential in district heating is far from fully exploited. It is a climate-efficient way to balance periodic electricity from wind and solar, to move waste heat to where it is needed and to use waste that can no longer be recycled. In addition, it’s also preventing harmful substances from spreading in the environment.

Stockholm is now combining cooling needs for computer server halls and grocery stores with heating needs in residential areas, thus reducing heat waste to almost nothing. Seasonal heat storage is developing, for example by using solar panels and temporary excess heat, to heat water and store it underground for winter use. Smart grids and increasingly efficient heat pumps will offer many new applications and possibilities to utilise also minor waste heat sources. For example, we’re seeing development of washers and dryers using the heat directly from the district heating grid, thus avoiding transformation losses to and from electricity.

Subsidies for oil and gas still prevail across the EU, mostly to help the poorest households. How can Europe cut its addiction to fossil fuel subsidies, without hurting the needy?

The Nordic way has been to include heating in the rent and set legal minimum heat standards. This gives a strong incentive to the house-owner to invest in energy-efficiency refurbishment such as increased insulation and energy-efficient windows. This has resulted in Nordic houses being far more energy-efficient than in most other parts of Europe, especially if you consider our much colder climate.

A system which, in contrast, allocates the energy bill to the tenant – which has no competence to do these measures – instead risks causing fuel poverty. Fuel poverty is non-existent in Nordic countries.

The Commission’s proposed “clean energy for all” package includes new requirements for renewables and energy efficiency in buildings. What are cities’ demands when it comes to promoting renewables in heating and cooling?

Cities play a crucial role triggering energy transition and we support the European Commission’s efforts towards a more sustainable and energy-efficient EU.

However, certain parts of the proposed energy package contain a level of detail that can be counterproductive to the development towards a fossil-free Europe. For example, a classification that allows

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houses with energy produced on the very building (i.e. solar) to be less energy-efficient than if they use district heating, (thus also making it difficult to use waste heat streams), or forcing all house-owners to install individual heat metering and billing, thus taking away all incentives to implement energy-efficient measures at building level.

In addition, easily achievable changes such as quickly switching to renewable fuels in coal-fired power plants and using the enormous waste heat potential these plants represent, is almost entirely overlooked in the proposal. Cities that have done this have managed to lower their energy bill substantially and increase their energy security to 100 %. Developing and utilising smaller district heating grids can be an important first step in the right direction.
While renewable energies gradually assert their dominance in power generation, the heating and cooling sector remains far behind, with fossil fuels – heating oil, gas or even coal – still making up 84% of Europe’s heating consumption.

Paula Abreu Marques, head of unit at the European Commission in charge of renewable energy, has called for more efforts to raise the share of renewables in heating and cooling. Renewables – such as biomass, solar or geothermal – currently represent only 18.6% of the total heating market. And the slow progress seen at national levels to increase this share is “unacceptable”, given the sector’s major contribution to energy consumption and global warming, she said.

Heating and cooling is responsible for 51% of final energy use in Europe and represents about 27% of CO2 emissions, according to the Commission.

“We need to achieve at least a 27% renewable share in heating and cooling” in order to reach the EU’s minimum target of 27% renewables in total energy consumption by 2030, Marques told a EURACTIV event on 30 May.

“This is essential if we want to achieve the target in a cost-effective way,” Marques emphasised. “If not, it means most of the burden will fall on the electricity sector. And that will make the target much more expensive to achieve,” she warned.

MASSIVE CHALLENGE

The challenge is indeed massive. Some 84% of boilers in Europe are currently powered by polluting fossil fuels like gas, heating oil or even coal, according to EU figures. And they’re spread out across millions of homes, which makes their replacement slow and more difficult to achieve.

“We have something like 120 million boilers all over Europe, which are very dispersed,” said Nigel Cotton of the European Copper Institute (ECI), a trade association.

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According to Cotton, solutions seem pretty straightforward. “We should stop fossil fuel subsidies, promote renewable heat – and let people know that renewable heating options are available to them – and increase the renovation rate in our buildings,” Cotton told industry delegates at the EURACTIV event.

This is easier said than done, though. There are currently 28 different ways of dealing with heating and cooling across the European Union, remarked Siim Meeliste, an energy counsellor with the Estonian government, which picks up the rotating EU Presidency from Malta on 1 July for the next six months.

From an EU perspective, the aim is to promote renewable energies in heating, without locking Europe in any technology – whether relying on biomass, solar thermal or electrification, Meeliste said.

“Heating and cooling is mostly a regional market,” Meeliste stressed, saying anything the policymakers decide at EU level should take a strategic perspective. “We don’t know yet what the energy prices are going to be in the next 5 to 10 years, let alone 20 to 30 years from now. So we need to build a framework that is flexible,” he emphasised.

Claire Roumet, executive director at Energy Cities, an association of local authorities, could not agree more. Because of its local dimension, heating has stayed “below the radar” at EU level until now, she remarked. But she said attitudes were changing and policymakers were now looking at heating as part of the wider energy system.

“What is super important is to make heat part of the energy system, because it adds a lot of flexibility, affordability and sustainability” to the energy system as a whole, she said.

BUILDINGS RENOVATION LAGGING BEHIND

There are few instruments to promote renewables in heating at the moment, however.

“If you want to have a sustainable or renewable heating and cooling system, you need to renovate your building stock,” said Maarten De Groote, head of research at the Buildings Performance Institute Europe (BPIE), a think tank.

But he said there was “hardly anything” in the Commission’s proposal for the revised Energy Performance in Buildings Directive (EPBD) to promote renewables in heating.

“On the level of renovation, there is nothing concrete either. That’s a huge failure,” he told EURACTIV in an interview.

ALL HOPES ON RENEWABLES DIRECTIVE

For proponents of renewables, this means all hopes at EU level now lie with the revision of the renewable energy directive, which was tabled last November as part of a wider package of legislation designed to decarbonise Europe’s energy system.

The European Commission’s proposed text stipulates that “Member State shall endeavour to increase the share of renewable energy supplied for heating and cooling by at least 1 percentage point every year.”

This is far too little for renewable energy advocates. José Blanco López, a Spanish socialist lawmaker who is the rapporteur on the directive for the European Parliament, wants to raise the objective to 2% and make it a legally binding obligation for member states.

But Marques conceded that “the

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The 1% objective can be seen as quite ambitious” considering the very diverse starting points of European countries. “If you look at Sweden or Estonia, there is already a lot of renewables in heating and cooling. Their chance of increasing that share by 1 percentage point every year is a big challenge – it’s asking a lot.”

The Commission estimates that half of Europe’s heat demand is in areas where population density is high enough for district heating infrastructure, which is widespread in Nordic countries. District heating systems are often run by local authorities and use gas- or biomass-fired cogeneration plants that produce both heat and power close to residential areas, reducing the need for central power production and heavy power grids.

But a switch to district heating would be a huge change for most of western Europe, where households mainly rely on individual gas-fired boilers for space heating and hot water.

For Meeliste, this means EU ambitions have to remain modest and take account of national situations. “Targets are needed to show the way,” the Estonian official said but other instruments can be more effective in countries like Estonia, where renewables penetration is already high in large commercial and industrial buildings.

“In Estonia specifically, we have depleted all that potential,” so raising the share further “means we would need to get into people homes,” Meeliste said. “And the costs of those two measures are not comparable. We should pick the lowest hanging fruit first.”

LIMITED ROLE FOR GRID-CONNECTED POWER

Others pointed to the limited role that grid-connected power can play in the short term to decarbonise the heating sector.

“Electricity will have a role in the future heating and cooling mix, but we must keep in mind that electrification is not the same as decarbonisation,” Cotton said in an opinion article for EURACTIV, underlining that fully decarbonising the electricity sector will take time and represent a “significant investment”. Renewables accounted for 27.5% of the EU’s gross electricity consumption, according to 2014 figures from Eurostat.

In the meantime, a range of renewable solutions is readily available, Cotton stressed, citing technologies such as biomass, cogeneration that reuses heat from industrial processes, or geothermal electricity that can feed hospitals and schools via district heating networks.

But he insisted that local authorities should be free to decide what is best for them. “Identifying the local heat resources and heat use will be key, so local authorities know what they have,” Cotton said.

What policymakers at European level can do is to set ambitious goals, he continued, backing calls by MEP López to raise the share of renewables in heating by at least 2 percentage point every year, instead of 1%.

“The stability of the regulatory framework for support to renewable investment planning at the local level is crucial,” Cotton said, calling on EU policymakers to back a higher target for renewables in heating.
If Europe wants to walk the talk on climate change, it needs to get out of fossil fuels by 2050. And the real ambition must be to drive change towards renewable heat, which is still addicted to fossil fuels, writes Nigel Cotton.

Nigel Cotton is director for building construction and technology at the European Copper Institute (ECI).

Born amidst the unpredictability of the Brexit vote and the clarification of Trump’s climate change intentions, one could see why the European Commission’s initial proposal for a Clean Energy for All Europeans package was just ambitious enough to support the Paris Agreement and just low enough to appease member states.

In the end, we will do neither! With the UK voting to leave the EU and Trump pulling the US out from the Paris Agreement, pandering to the extremes is no longer necessary. Indeed, times have changed, new alliances are forming and the need for more ambition prevails more than ever. If Trump wishes to give up the US leadership on Climate Change, then Europe should grasp the role with open hands and deliver on its promise to be world number one in renewable energies.

If Europe wants to walk the talk, then we need to be out of fossil fuel by 2050 to meet our CO2 objectives and encourage investment in renewables, not fossil-based electricity and gas.

The real ambition must be to drive change towards renewable heat. The heating market is 50% of the energy market, and it is currently addicted to fossil fuels. [Sali Sasaki/Flickr]

Keeping Europe’s ambition alive on renewable heat

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heating is available. We must have clear ambitious policy goals to reduce policy risk, ease financing. And make renewables in heating and cooling mainstream.

Through encouraging investments in Renewable Energy Sources in Heating and Cooling (RES-HC), the Clean Energy for All Europeans package presents a real opportunity to show Europe’s citizens how the European Union helps improve their lives, homes, work, schools, hospitals and environment.

By actively supporting RES-HC across Europe, EU policy-makers can stimulate the SME economy, finance jobs and reduce fossil fuel use through efficient use of heat and renewable technologies. Hence, billions of euros, which would otherwise have exited the EU to fund fossil fuel producer countries, would instead circulate in the EU creating economic growth.

Consumers will play a major role in this process, by decarbonising their consumption and future proofing their businesses and homes. Replacing a broken boiler is often a stressful time. It’s urgent; it needs to be available locally, installed quickly and not be too expensive. For that to happen, consumers need options, be it through a utility or self-consumption to find the right choice that meets their needs. To accomplish this means raising awareness of renewables at a local level and, most importantly, stop locking consumers into fossil fuels.

The EU must begin replacing Europe’s 100 million inefficient boilers by providing replacement schemes which encourages “planned replacement” with more efficient and renewable heating systems by labelling existing equipment under the Energy Performance of Buildings Directive.


The European Commission opened some opportunities for RES-HC. Now the European Parliament, for the sake of the climate, the economy and its citizens, must raise the bar in favour of RES-HC. If we seriously want to decarbonise buildings, efficient renewable heat must be clearly eligible under the energy efficiency obligation scheme in the Energy Efficiency Directive.

The heat obligation in the RES Directive must be mandatory to allow for accelerated deployment, a stronger industry, with more innovation and reduced CO2 in line with our decarbonisation objectives. For this ambition, there must be an annual increase in the share of renewables in heating and cooling of two percentage points per year.

We are designing today the energy system of the future, a system where electricity, heating and cooling and transport interact in synergy, where decentralised generation complements centralised supply, where a broad variety of energy sources and technologies compete to bring better offers to the market.

In such a future, electricity will have a role in the future heating and cooling mix, but we must keep in mind that electrification is not the same as decarbonisation. For decarbonisation of the heating sector, a significant investment in decarbonised electricity would be needed to offset the additional demand. And remember there is more renewable heat consumed today than renewable electricity.

Where we can decarbonise using electricity, we need to do it in an efficient way. That means using renewables-based electricity including biomass and geothermal, highly efficient heat pumps and targeting sectors with temperatures above 500°C which are not easily covered yet by RES-HC.

RES-HC solutions can work from houses to industrial process heat, from district heating to hospitals and schools; to neighbourhood schemes.

Identifying the local heat resources and heat use will be key, so local authorities know what they have. The stability of the regulatory framework for support to renewable investment planning at the local level is crucial. The proposal from the European Parliament rapporteur on RED greatly reduces the risk of policy shifts at the national level.

All these solutions could mitigate climate change and improve citizens’ lives – starting today. Renewable technologies exist and are ready to deliver, we just need more ambition and a stronger political vision to support investments, and trust in Europe’s heating and cooling sector.
Europe’s ‘energy poor’ trapped by lack of viable green option

Fuel poverty affects tens of millions of Europeans. Coupled with continuing subsidies for fossil fuel boilers, this means decarbonisation efforts face a real uphill struggle.

Anywhere between 50 million and 125 million Europeans struggle to heat their homes adequately, according to different sources.

The main driver of energy poverty is a combination of low income, high energy costs and poor insulation of European houses.

EU attempts to ramp up energy efficiency and renovate the building stock attack one of the root causes of high fuel prices. Improving wages, meanwhile, is a wider and far more complex problem that covers all sectors.

Renewable energies will also play a part. In order to meet EU climate and energy goals, including a fully decarbonised building stock by 2050, renewables have to be fully promoted into the heating and cooling sector.

As boilers typically have a 20-30 year lifespan that means, ideally, that no new fossil fuel-burning boilers should be installed after 2030. Otherwise, forced decommissioning could be needed in order to meet targets, which could only exacerbate the fuel poverty issue.

But given that subsidies for fossil fuel-burning boilers are still in place, the poorest consumers are currently being put in an uncomfortable position: Not only do they have to pick between heating and eating, they are also under pressure to balance their personal heating choices with global politics on climate change.

When confronted with this unfair choice, it becomes difficult to plump for a renewable-powered boiler over a cheaper, albeit less green, option.

Subsidy schemes for renewables in heating are actually in place in some member states. Unfortunately, these programmes are either not of the scale needed to make a difference to those struggling to get by, or have been mismanaged.

‘CASH FOR ASH’ IN NORTHERN IRELAND

The UK Conservative Party’s new...
political bedfellows, the Northern Irish Democratic Unionist Party (DUP), are still trying to escape a scandal involving boilers and subsidies.

Its 2012 Renewable Heating Incentive (RHI) was set up by current party leader Arlene Foster and was intended to encourage the use of eco-friendly wood-burning boilers.

But when it emerged that it would cost the taxpayer nearly half a billion pounds over two decades, the government stopped accepting new applicants for the scheme in 2015. It will, however, have to honour commitments up to 2032 made to nearly 2,000 people that had already signed up.

The main problem of what has now been dubbed the ‘cash for ash’ offer was that it was uncapped and subsidies were too generous. In the end, the more you burned the more you earned: Under the scheme, for every pound spent by the participant, £1.60 could be paid as a subsidy.

RHI programmes are in place in other parts of the United Kingdom. A company receiving £192,000 in subsidies could, in fact, be eligible for £860,000 under the Northern Irish criteria.

The system has already been abused and hundreds of cases are under investigation. A few participants have had their subsidies cut off after being found guilty of fraudulent practices.

AIR QUALITY

There is also the small matter of deciding whether switching to wood-burning boilers is actually an eco-friendly move. Critics insist that using wood as a fuel only shifts the problem.

Wood currently makes up 85% of renewable in heating, according to environmentalists who warn more forests risk being cut down as a result of EU efforts to promote renewables in heating.

“Of all the wood used for energy roughly 40% is actually ‘residential consumption’ – mostly woody biomass for heating,” said the EU Bioenergy Policy Officer at BirdLife Europe, Sini Eräjää. In Eastern Europe in particular, people often simply heat their houses with logs from the area, due to lack of alternatives or income, she says.

And all this wood burning is creating air pollution, BirdLife points out. Domestic heating was responsible for about 43% of the harmful particulate matter PM2.5 emissions in 2010, a share which is expected to remain stable over time, dropping to only 41% in 2030, according to estimates from BirdLife.

“So I’d say there’s a lot of ‘hot air’ in the renewable heating,” Eräjää told EURACTIV.com.

Others point out that the problem for air quality is not biomass but boilers without cleaning. “Air quality will suffer regardless if you burn biomass, coal, oil or natural gas in boilers without cleaning,” said Karin Wannngård, the mayor of Stockholm.

In Stockholm, the municipality ran a programme to substitute about 100,000 oil and coal chimneys without cleaning with less than 10 using state-of-the-art exhaust cleaning. As a result, “the air quality in Stockholm is 100 times better than before,” Wannngård said.

And other incentives for renovation means fuel poverty in Nordic countries more generally is now a thing of the past, Wannngård told EURACTIV in an interview.

The fact is, more wood is being burned in the UK than at any time since the Industrial Revolution. While not releasing nearly as much CO2 as fossil fuels, it does make its own modest contribution as well.

So in order to make RHI schemes work, a cap has to be put on the amount of subsidy that can be claimed, otherwise, the entire programme risks becoming politically toxic. They also have to be regulated better in order to make sure consumers are using it for its intended purpose.

Every system is open to exploitation but the last thing fledgling initiatives like this need is stories of empty buildings being heated, at a profit, by people not buying into the spirit of the scheme.

Lawmakers, therefore, have to walk a fine line between offering a big enough incentive to go green, without adding to the fuel poverty problem and offering something that is economically and politically viable.

Earlier this week, EU energy ministers agreed on a general approach to the revision of two crucial energy efficiency directives, which includes a pledge to “take into account the need to alleviate energy poverty” when introducing new measures.

If the EU is to meet its climate and energy targets, as well as honouring this promise to help people that struggle to heat their homes, it will have to perform a fine balancing act.