

DELIVERING NET ZERO EMISSIONS IN THE EUROPEAN UNION

INTRODUCTION

On 17 September 2020, the European Commission proposed an increased economy-wide EU greenhouse gas emissions reduction target of at least 55% by 2030 compared to 1990, including emissions and removals.¹ As the Commission makes clear in the introduction to its published proposals, establishing a target of at least 55% by 2030 is essential in order to set a “balanced, realistic, and prudent” pathway to a net zero EU economy by 2050. The European Parliament has voted to approve the EU Climate Law, proposing a 2030 target of a 60% reduction compared to 1990. It has also proposed that each Member State has the responsibility individually to reach net zero by 2050, and that a European Climate Change Council (ECCC) should be set up as an independent scientific advisory body complementing the work of the European Environment Agency (EEA).

As we approach COP26 in 2021, the EU is aiming to submit a new Nationally Determined Contribution (NDC) under the Paris Agreement to the UNFCCC by the end of 2020, incorporating the new targets. The EU and China have stepped up co-operation on addressing climate change, and the recent announcement by President Xi Jinping of a goal for China to become carbon neutral by 2060 demonstrates these two giant economies may be ready to lead global action to cut emissions, as the world awaits the outcome of the US election in November.

The Commission’s impact assessment shows that acting decisively now helps not only to reduce the chance of greater temperature increases and more damaging climate change impacts, but will also deliver significant benefits in terms of equitable economic growth, alongside health and environmental co-benefits for EU citizens. It also highlights the fact that accelerating 2030 climate ambition will reduce the risk of carbon lock-in and increase certainty for investors, supporting them to deliver private investment in the low-carbon economy.

The COVID-19 pandemic is a health crisis that has also had huge social and economic impacts. The EU has stated very clearly that the COVID crisis does not reduce or delay the necessity for action to tackle the climate crisis. Moreover, the European recovery plan is built on the understanding that measures to generate economic growth and jobs to recover from the impacts of the pandemic can and must be used to drive a just transition to a sustainable and net zero carbon economy. Indeed, these objectives are highly aligned, which creates a great opportunity to ‘build back better’.

The EU Green Deal, together with the EU Climate Law, set out the targets for the EU to achieve net zero emissions by 2050 and the scope of policy measures that will be required to deliver this across key sectors of the economy. Public and private finance will play an important role in financing the transition, through the EU budget and associated instruments as well as private sustainable investment. An overall climate target of 30% is proposed for expenditure from both the EU budget 2021-27 and for the EUR 750 billion of Next Generation EU package of COVID recovery funds.² The

¹ https://ec.europa.eu/clima/sites/clima/files/eu-climate-action/docs/com_2030_ctp_en.pdf.

² <https://www.consilium.europa.eu/media/45109/210720-euco-final-conclusions-en.pdf>

EU Taxonomy responds directly to the EU's environmental challenges and directs finance consistent with a net zero 2050 target. The EU and Member States can apply the EU Taxonomy to screen and track climate and environmental spending in support of the EU Green Deal goals.³

Based on research by Vivid Economics as part of the [Inevitable Policy Response](#) (IPR) project, and drawing on other leading sources of research, PRI has developed this roadmap of policies which are necessary to deliver a net zero EU economy by 2050. The policy recommendations address the overall climate ambition and key sectors for decarbonisation: power, road transport, buildings, and industry. Together, these recommendations describe essential near-term actions to deliver on the EU climate goals of at least a 55% reduction in emissions by 2030 and reaching net zero by 2050 in a way that is economically, politically and technologically achievable and ultimately beneficial. In addition to these policy areas, we note that new policy will also be needed for aviation and shipping, and agriculture and land use in order to achieve a net zero target, and that the EU should conduct further work to identify appropriate emissions pathways, targets, and policies for these sectors.

Investors in the EU and globally recognise the urgency and importance of acting to deliver net zero in line with the goals of the Paris Agreement. As the IPR analysis shows, delayed, disruptive and disorderly policy response to climate change risks undermining the value of financial assets as well as increasing the difficulty of reducing emissions at the required rate. On the other hand, early and ambitious action creates certainty for markets to seize the opportunities for growth and job creation that are provided by the sustainable and low-carbon industries of the future. For these reasons, investors are both supportive of policy action to reach net zero and ready to contribute capital and collaborate with policymakers to design and implement policies that facilitate investment flows at scale.

The EU's climate ambition has increased over time and is now set towards achieving the goal of climate neutrality by 2050. In many ways the EU is now embracing an "Inevitable Policy Response". Many policy packages contribute to create a path towards achieving net zero GHG emissions in the EU. These include:

- **The 2020 climate and energy package**, agreed in 2008, which sets EU-wide targets to be achieved by 2020. Such targets include a reduction of GHG emissions by at least 20% compared to 1990 levels, a reduction in energy consumption by 20% of projected 2020 levels through energy efficiency improvements and an increase in the use of renewables to 20% of total energy production. The EU is on track to meet these targets (European Commission, 2019a).⁴
- **The 2030 climate and energy framework.** The new 2030 climate ambition framework to be agreed in 2020 replaces the 2014 framework, which EU-wide targets to be achieved by 2030. The Commission proposal is for a new target of a reduction of GHG emissions by at least

³ For details on the EU recovery packages, see PRI's [Position Paper: Multiannual Financial Framework \(MFF\) and Next Generation EU](#).

⁴ European Commission (2019a), COM(2019) 225 final Renewable Energy Progress Report.

55% compared to 1990 levels; with targets including those for renewables share of energy and for energy efficiency due to be reviewed in light of the increased overall ambition.

- **The European Green Deal**, released in 2019, which provides a roadmap for future EU climate policy. The plan focuses on making the EU climate neutral by 2050, moving to a circular economy and restoring biodiversity through a specified set of actions.⁵
- **The proposed European Climate Law**, presented in 2020, which would set into law the goal of achieving net zero emissions in the EU by 2050, set a new 2030 target for GHG emissions reduction and implement measures to keep track of progress.⁶ The draft Climate Law underwent a process of public consultation for a duration of 12 weeks starting in March 2020.⁷
- **The European Recovery Plan**, which was announced in 2020 to counteract the social and economic damages brought by the coronavirus pandemic.⁸ The plan made available several funding streams to foster a low-carbon economic recovery, for a total of around EUR 750 billion.

⁵ European Commission (2019b), COM(2019) 640 final The European Green Deal.

⁶ European Commission (2020a), *Committing to climate-neutrality by 2050: Commission proposes European Climate Law and consults on the European Climate Pact*, press release.

⁷ European Commission (2020b), *Commission launches online public consultation to gather stakeholder views on EU 2030 climate ambition increase*, press release.

⁸ European Commission (2020c), COM(2020) 442 final The EU budget powering the recovery plan for Europe.

FIVE PRIORITY POLICY AREAS

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| <p>Overall climate ambition</p> <ul style="list-style-type: none"> ■ Implement the EU commitment to net zero GHG emissions by 2050 in the EU Climate Law and revise the 2030 target for GHG reductions to at least 55%. ■ Implement a comprehensive EU carbon pricing strategy, ensuring alignment with 2030 and 2050 targets, considering extending the scope of the EU ETS, and setting out proposals for a carbon border adjustment mechanism. | |
| <p>Zero-carbon power</p> <ul style="list-style-type: none"> ■ Strengthen renewable energy targets in line with the increased 2030 targets and 2050 climate neutrality objective. ■ Require Member states to set and meet coal phase out and CO₂ intensity targets for electricity generation. | <p>Road transport</p> <ul style="list-style-type: none"> ■ Increase uptake of low-carbon cars and vans by strengthening regulation and financing charging infrastructure, to ensure phase out of ICE cars and vans by 2035. ■ Develop and implement a comprehensive strategy to decarbonise heavy road transport by 2050. |
| <p>Buildings</p> <ul style="list-style-type: none"> ■ Require the new building stock to comply with more stringent thermal efficiency standards. ■ Increase ambition for the existing building stock to undergo renovation to high thermal efficiency standards – at least doubling the annual renovation rate. ■ Member states should be required to develop and implement national strategies for zero-carbon heat. | <p>Industry</p> <ul style="list-style-type: none"> ■ Implement new strategies on zero-carbon manufacturing, setting a roadmap and objectives for energy intensive industries to decarbonise by 2050. ■ Strengthen energy efficiency standards by updating the lists of Best Available Technology and reforming the Energy Efficiency Directive. |

OVERALL CLIMATE AMBITION

CURRENT SITUATION

GHG emissions in the EU have been decreasing over the last 20 years, but in recent years progress has slowed. Between 1990 and 2018, GHG emissions decreased by around 22% in the EU.⁹ During that period, emissions reductions took place in all sectors except the transport sector. However, between 2014 and 2018 total GHG emissions in the EU increased slightly, with the largest increases in the transport and buildings sectors.^{10 11}

Plans are underway to increase climate ambition in the EU. The proposed European Climate Law would commit to reducing net GHG emissions to zero by 2050, thus achieving climate neutrality. In line with this commitment, the Commission has presented an impact assessed plan to increase the EU's GHG emission reduction target for 2030 to at least 55% compared with 1990 levels (from the existing target of 40%, which was set in 2014).

The EU needs to significantly step up its mitigation efforts to meet the new 2030 emissions reductions target and the 2050 net zero goal. The European Commission estimates that the EU is on track to meet the target of 20% GHG emissions reductions by 2020. However, even to meet the existing target of a 40% reduction by 2030, the EU would need to reduce emissions by 81 Mt CO_{2e} every year from 2017 to 2030 - double the 46 MtCO_{2e} reduction per year achieved since 1990. Currently adopted and planned national climate mitigation falls well short of the levels now required by the newly proposed 2030 and 2050 emissions reduction targets.¹²

KEY POLICY RECOMMENDATIONS

- Implement the proposed commitment to reduce net GHG emissions to zero by 2050 in the EU Climate Law, and the proposed interim target to reduce emissions by at least 55% by 2030 compared with 1990 levels.
- Assess the consistency of EU and Member State measures in relation to the climate neutrality objective and the 2030-2050 trajectory by September 2023, and every five years thereafter; and issue recommendations to Member States where actions are inconsistent with those goals.
- To align the EU Climate Law with international best practice, the Climate Law should make provision for independent, scientific assessment of the EU-wide trajectory and progress reporting. This should be separate from the European Commission.
- Develop and introduce a comprehensive EU carbon pricing strategy. The strategy should consider introducing carbon pricing for buildings, road transport and other sectors; conducting an assessment of the choice of policy instrument, including extension of the EU ETS or alternatives such as carbon taxes.

⁹ European Commission (2018), A clean planet for all.

¹⁰ Eurostat Database (2020), Greenhouse gas emissions by source sector.

¹¹ European Environment Agency (2019a), Greenhouse gas emissions by aggregated sector.

¹² European Environment Agency (2019d), Trends and projections in Europe 2019.

- Action on carbon pricing should ensure that future EU ETS caps are aligned to the 2030 and 2050 emissions reduction targets, take account of interactions between carbon pricing and other climate policies, and include proposals for a carbon border adjustment mechanism.

Achieving net zero GHG emissions by 2050 need not have a significant impact on GDP. The European Commission estimated that real GDP in 2050 would be between 1.3% lower and 2.2% higher than in a business-as-usual scenario. Reaching climate neutrality could also improve the EU's trade balance. Under net zero GHG emissions scenarios, costly EU energy imports are projected to fall to 20% of the energy consumed by 2050, largely because of the lower dependence on fossil fuels. This is estimated to reduce the expenditure on fossil fuel imports to 0.8% of GDP in 2050.¹³

Extending the EU ETS to cover more sectors could help ensure that the EU achieves climate neutrality at least cost. In order to avoid a loss of competitiveness for energy-intensive EU businesses relative to competitors in jurisdictions without a sufficient carbon price in place, resulting in carbon leakage, the EU should complete its ongoing assessment of the potential for a carbon border adjustment to impose a fee on products imported from such jurisdictions, and table necessary legislation in the first half of 2021 as proposed by the Commission.

ROLE FOR INVESTORS

Investment needs are higher in a scenario that achieves net zero GHG emissions by 2050. A modelling study from the European Commission showed that pathways that deliver net zero GHG emissions by 2050 could require an additional annual investment between EUR 176 billion and EUR 290 billion, or around 1.2% of GDP, compared to a scenario that extends current ambition.

Between EUR 34-91 billion could be directed every year to the transport sector. Additional investment in power plants could range between EUR 54-80 billion yearly, while between EUR 19-31 billion of additional investment could go to improvements of the power grid. Other sectors with significant additional yearly investment include industry (EUR 11-17 billion) and the residential sector (EUR 27-28 billion).¹⁴

¹³ European Commission (2018), A clean planet for all.

¹⁴ European Commission (2018), A clean planet for all.

ZERO CARBON POWER

CURRENT SITUATION

The 2009 Renewable Energy Directive set a renewable energy target of 20% of energy consumption by 2020, which the EU is in line to meet.¹⁵ The 2018 Renewable Energy Directive sets an EU-wide 2030 target for renewable energy at 32% of energy consumption. Under the proposed new 2030 climate target plan, this would need to increase to at least 37.5%, with the share of renewables in electricity generation reaching at least 65% by 2030 from around 32% today.¹⁶

To meet the new 2030 renewable energy target, the growth pace of renewable energy consumption in the EU will need to increase. To meet the climate neutrality target, between 2020 and 2050 the share of renewable energy consumption may need to grow by 3.4% per year, compared with 0.7% per year over the period 2005-2017.¹⁷

The EU still generates more than 20% of electricity from coal, and new coal power capacity is planned or under construction in some member states. Some, but not all, member states have announced coal phase out dates ranging from 2020 to 2038. While reduced demand for coal power is accelerating shutdowns of coal mines and power plants across Europe, strong policies are required to ensure that continued coal power generation is ruled out.

Currently, policies are not in place to deliver the required increases in renewable energy generation. Meeting targets in line with the increased 2030 climate ambition and 2050 net zero goal will require the EU to significantly step up its efforts to replace fossil fuels with renewable energy, increase investors' confidence in renewables, and adapt energy markets to facilitate a growing share of variable renewable energy production.

KEY POLICY RECOMMENDATIONS

The EU must substantially increase the level of ambition for decarbonising electricity generation:

- Carry out a detailed assessment of the role of renewable energy in meeting the 2030 emission reduction target and the 2050 net zero goal. Strengthen the Renewable Energy Directive as required to deliver the amount of renewable energy required to meet the targets.
- In the near-term, fulfil the European Recovery Plan commitment for the new Strategic Investment Facility to invest in renewable and energy storage technologies, prioritising investment in member states with low levels of these technologies.
- Build on current requirements to phase out subsidies for coal-fired electricity generation by requiring member states to set and meet coal phase out targets.

¹⁵ European Commission (2019a), COM(2019) 225 final Renewable Energy Progress Report.

¹⁶ "Stepping up Europe's 2030 climate ambition", European Commission (September 2020). Impact assessment at: https://eur-lex.europa.eu/resource.html?uri=cellar:749e04bb-f8c5-11ea-991b-01aa75ed71a1.0001.02/DOC_1&format=PDF

¹⁷ European Environment Agency (2019d), Trends and projections in Europe 2019.

- Require member states to set and meet carbon intensity targets for electricity generation in line with the 2030 and 2050 targets.

Renewables are now cost-competitive with fossil fuels on a kWh basis, though integrating them into electricity systems may entail some additional costs. This is because of the rapidly falling costs of wind and solar energy.¹⁸ However, achieving net zero GHG emissions in the EU may entail some increase in electricity prices due to the additional costs of balancing variable renewables with demand and the need for investment to increase flexibility.¹⁹

Renewable energy uptake can benefit the EU's trade balance, job market and environment. In addition to reducing import dependence from fossil fuels, investment in renewable energy assets could also support a larger EU job market, as the sector has high economic multipliers.²⁰ In 2018, the sector supported around 1.2 million jobs in the EU.²¹ For each megawatt of renewable energy capacity added, small photovoltaic projects could potentially add around 9 jobs and large photovoltaic projects could add 5 jobs to the economy (US Environmental Protection Agency, 2018). The uptake of renewable energy can also bring numerous health and environmental benefits.

In the EU, new coal plants are more expensive than new renewables. Around 20% of EU coal power capacity is estimated to have a higher operating cost than new renewables now. This share could increase to 100% of existing and new coal capacity by 2030.²²

ROLE FOR INVESTORS

In 2018, Europe achieved around USD 55 billion of investment in renewables. This accounted for three-quarters of all generation investment, with wind power the largest source of investment. A Paris-aligned transition could require over 600 GW of additional renewable capacity to be installed in the EU by 2040, averaging around 30 GW per year. Of this, 50% could be in wind and 39% in solar capacity.²³ To achieve such increases in renewable generation capacity, yearly investment needs may need to increase to around USD 70 billion.²⁴

Strategic EU funds can reduce investment risk and financing costs for investors in renewable generation. The Strategic Investment Facility (SIF) is an investment vehicle targeting renewable and energy storage technologies. The SIF has been added to the InvestEU framework to respond to higher investment needs in the EU following the outbreak of the coronavirus pandemic. Other significant funds include the European Fund for Strategic Investment and the European Structural and

¹⁸ European Commission (2019d), The state of renewable energies in Europe 2019.

¹⁹ International Energy Agency (2020a), Introduction to System Integration of Renewables.

²⁰ Hepburn et al (2020), Will COVID-19 fiscal recovery packages accelerate or retard progress on climate change?

²¹ IRENA Jobs Database (2020), found at <https://www.irena.org/benefits/Job-Creation>

²² Carbon Tracker (2018), Powering Down Coal.

²³ International Energy Agency (2019a), World Energy Outlook 2019, Annex A.

²⁴ International Energy Agency (2019b), World Energy Investment.

Investment Fund. These schemes can provide initial capital for renewable generation projects, thereby reducing investment risk and helping mobilise additional private finance.

ROAD TRANSPORT

CURRENT SITUATION

GHG emissions from fuel combustion in cars and light-duty trucks in the EU totalled 568 MtCO_{2e} in 2018, making up over 16% of total emissions. This represents a 26% increase in emissions from 1990, but a 1% decrease from 2008 levels.²⁵ GHG emissions from HDVs have increased by almost one third compared to 1990 levels, but have stabilised in recent years.

The 2019 new car CO₂ regulation requires manufacturers to achieve a 15% reduction in new car and van CO₂ emissions by 2025, and a 37.5% reduction for cars and 31% reduction for vans by 2030, relative to a 2021 baseline. For heavy duty vehicles (HDVs) the obligation is to achieve a 15% reduction by 2025 and 30% by 2030. However, there are no policies to drive a full phase out of internal combustion engine (ICE) vehicles, which would be needed to meet the goal of climate neutrality by 2050. There is also no policy in place to co-ordinate zero-carbon fuelling infrastructure for HDVs.

The market share of new electric vehicles is rapidly increasing in Europe. The share of electric vehicles out of new registered vehicles increased from 0.2% in 2012 to 2.5% in 2019.²⁶ The expansion of the EV market continued in 2020. During the first quarter of 2020, the EV segment in Europe more than doubled its market share compared to the same quarter in the previous year, rising from 2.5% to 6.8%.²⁷

The Sustainable and Smart Mobility Strategy was announced as part of the EU Green Deal and is due to be released before the end of 2020. The commission aims to adopt a comprehensive strategy to deliver on the Green Deal target to reduce transport-related GHG emissions by 90% by 2050.

KEY POLICY RECOMMENDATIONS

- Strengthen and extend new car and van CO₂ regulations, progressively reducing average new car CO₂ emissions and towards zero by 2035, to increase market share of ZEVs to 100% by 2035 and ensure the phase out of ICE vehicles.
- Fulfil the European Recovery Plan commitment for the Connecting Europe Facility, InvestEU, and other funds that will support the financing of the installation of one million charging points, focusing on member states with low levels of electric vehicle deployment and limited charging infrastructure.

²⁵ Eurostat Database (2020), Greenhouse gas emissions by source sector.

²⁶ European Environment Agency (2019c), Electric vehicles as a proportion of the total fleet.

²⁷ GlobalFleet (2020), EV sales more than doubled in Europe.

- Develop and implement a comprehensive EU heavy road transport decarbonisation strategy. The Strategy should set a clear objective of decarbonising heavy road transport by 2050 and set out a roadmap to achieving that objective.

The strategy for heavy road transport decarbonisation should be supported by detailed technical and economic analysis on pathways to decarbonise road transport, the barriers to achieving these pathways and solutions to address them, including a programme of R&D, demonstration and deployment projects to commercialise low-carbon trucks. The strategy should set out a timeline to implement these solutions and to develop the necessary policy framework to decarbonise heavy road transport by 2050. Finally, the strategy should align to the new Clean Hydrogen Strategy committed to in the European Recovery Plan, and include measures to shift freight from road to rail.

Forecasts suggest that electric vehicles could reach up-front price parity with ICE vehicles by mid-2020s without subsidies. This is partly due to the falling cost of lithium-ion batteries, which decreased by 87% between 2010-2019 and by 13% in 2019 alone.²⁸

Savings on fuel and maintenance costs for EVs compared to ICE vehicles could drive EV uptake in the EU. This is especially true for companies that operate entire vehicle fleets, have an intensive use of vehicles and have predictable driving patterns and thus range requirements. For this reason, corporate customers, which account for around 50% of passenger car ownership and new car sales, are usually among the early EV adopters.^{29 30} Zero-carbon trucks are forecast to become cost competitive in the 2020s, with similar upfront costs to diesel or gasoline trucks, but much lower operating costs due to the higher efficiency of electric engines.³¹ However, shifting to zero emissions trucks could entail some infrastructure costs. These costs include the costs of installation, operation and maintenance of recharging or refueling infrastructure.

Expanding the electromobility value chain could benefit the EU's economy through an enlarged job market and an improved trade balance. By 2030, it is estimated that around 255,000 jobs in the electromobility value chain could be created in Europe. This is more than 3 times the number of jobs lost in automotive manufacturing.³²

ROLE FOR INVESTORS

In 2018 Europe was the world's second largest electric passenger car market behind China, with around 20% of global sales for a total of 385,000 units. Investment in the electric car market value chain has increased in recent years. In 2019 the EU has received EUR 60 billion of investment in EVs

²⁸ Bloomberg New Energy Finance (2020), Electric Vehicle Outlook 2020.

²⁹ McKinsey&Company (2014), Electric vehicles in Europe: gearing up for a new phase?

³⁰ Deloitte (2017), Fleet management in Europe.

³¹ Energy Transitions Commission (2018), Mission Possible.

³² European Association of Electrical Contractors (2018), Powering a new value chain in the automotive sector.

and batteries, up from EUR 3.2 billion in 2017-18. Investment in the EU was greatest in Germany, which received EUR 40 billion of investment, followed by Czech Republic with EUR 6.6 billion.³³

Investors can provide capital to finance the expansion of the electromobility value chain. Investors can act in partnership with charging companies, automakers and local authorities that deploy electric vehicles and related infrastructure and services. These include investment in the installation and maintenance of charging stations, the manufacturing of battery cells and charging equipment, as well as reinforcing the electricity grid and linking it to EV chargers.

ENERGY EFFICIENT BUILDINGS

CURRENT SITUATION

The 2010 Energy Performance of Buildings Directive, updated in 2018, requires new public buildings from 2019 and all new buildings from 2021 to be 'nearly zero-energy buildings'. However, there are no defined, specific standards of performance that are consistent across member states.³⁴ The Directive also requires each member state to establish a long-term renovation strategy aiming at decarbonising national building stocks by 2050, including indicative milestones and progress indicators for 2030, 2040 and 2050. However, direct responsibility for policies remains with member states.

The Renovation Wave is an EU project that seeks to address the low decarbonization and renovation rates for buildings and tackle underlying barriers to improving the energy efficiency of the EU building stock. The Commission is scheduled to adopt a plan by the end of 2020.

The buildings sector is responsible for approximately 40% of energy consumption and 36% of CO₂ emissions in the EU. New buildings today consume on average around half of the energy consumed by buildings constructed in the 1980s.³⁵ Despite improvements, a large share of the EU building stock is still energy inefficient and the share of new near-zero energy buildings remains low.³⁶

The Energy Efficiency Directive sets economy-wide targets of energy efficiency savings of 32.5% relative to business-as-usual by 2030, largely coming from the buildings sector. Member States are required to achieve an annual energy saving obligation of 0.8% of final energy consumption between 2021-2030. This is expected to trigger investment in end-use sectors, and especially in the buildings sector.³⁷

³³ Transport & Environment (2020), Can electric cars beat the COVID crunch?

³⁴ Designing Buildings (2020), Nearly zero energy buildings.

³⁵ European Commission (2019e), Comprehensive study of building energy renovation activities and the uptake of nearly zero-energy buildings in the EU.

³⁶ European Commission (2020f), EU Buildings Database.

³⁷ European Commission (2018), A clean planet for all.

The Renewable Energy Directive (2018/2001/EU) includes renewable energy captured by heat pumps within its renewable energy target of 32% of energy consumption by 2030, therefore indirectly driving heat pump deployment. However, no policy is specifically designed to drive uptake of zero-carbon heat.

GHG emissions from heating have decreased by 19% in the last decade and more than one fifth of energy use in heating and cooling comes from renewable sources. GHG emissions from fuel combustion in households in the EU in 2018 accounted for around 8% of total GHG emissions in that year. Emissions have decreased by 19% from 2008 levels and by 28% from 1990 levels.³⁸ Heating accounts for 66% of household energy consumption.³⁹

KEY POLICY RECOMMENDATIONS

- Reform the Energy Performance of Buildings Directive to require objective and stringent thermal efficiency standards for new buildings across member states.
- Substantially increase the level of ambition for buildings renovation.
 - In the short term, fulfil European Recovery Plan commitment to provide funds from the Recovery and Resilience Facility to at least double the annual renovation rate of existing building stock.
 - In the long term, reform the Energy Performance of Buildings Directive, with Member States to require owners to renovate buildings to high standard of thermal efficiency at key trigger points (sale, rental, change of use, etc).
- Require member states to develop national heat strategies. Strategies should set clear objectives to decarbonise buildings by 2050; align to the new Clean Hydrogen Strategy committed to in the European Recovery Plan; and set out roadmap to deploying heat pump, district heating, and green gas infrastructure and appliance deployment to meet this objective.

More stringent thermal efficiency standards for new buildings may lead to higher costs for developers and property buyers, which could be offset by government support for energy efficiency through subsidies or grants. On the other hand, significantly reduced energy use can reduce energy bills and help address fuel poverty, which is estimated to affect around 9% of the EU population.⁴⁰

The costs of renovating existing buildings could be split across owners, renters and Government, with Government providing appropriate subsidies and tax exemptions to reduce the cost burden on them. Buildings renovation can also lead to job creation in the construction sector. Cambridge Econometrics (2015) estimates that a 30% increase in energy efficiency in the EU could add to the economy between 0.6 million and 1.4 million jobs in the construction sector by 2030. Investment in buildings energy efficiency renovations and retrofits is likely to be effective in providing short-term stimulus for COVID recovery, as the sector has high economic multipliers. Renovations lead to a building stock

³⁸ Eurostat Database (2020), Greenhouse gas emissions by source sector.

³⁹ Odyssee-Mure (2018), Energy efficiency trends in buildings.

⁴⁰ European Commission (2017), Smart Finance for Smart Buildings Investment Facility.

that is more resilient to extreme weather events, which are expected to take place more often as temperatures rise.

ROLE FOR INVESTORS

The buildings sector has the largest investment gap across the economy. In 2019, investment in buildings' energy efficiency in Europe totalled around USD 60 billion.⁴¹ Investment may need to triple to meet the energy efficiency targets set in the Energy Efficiency Directive for 2030, and more than triple to implement more stringent thermal efficiency standards needed to achieve new emissions reduction targets.⁴²

Existing EU investment vehicles can support private investors to bridge this gap. Investors can take advantage of the financing streams made available by the EU for energy efficiency, such as the Smart Finance for Smart Buildings Initiative: this is an instrument that facilitates investment by using EU grants as a guarantee for projects related to buildings' energy efficiency.⁴³

Sustainable investors in new buildings will direct capital towards building developments with low energy demand coming for the most part from renewable sources and near-zero net GHG emissions. Such buildings will be equipped with features to increase efficiency, such as insulation materials, ventilation systems with heat recovery, triple glazed windows and smart meters, as well as low-carbon technologies such as heat pumps. Building Operating Systems will use sensors and real-time data to monitor buildings' performance and achieve energy savings.⁴⁴

Around EUR 177 billion per year of investment in buildings energy efficiency may be required from 2021 to 2030 to achieve EU 2030 climate targets.⁴⁵ Between 2012 and 2016 the most common financing option for home renovation works in the EU was a combination of own capital and a loan at market conditions, with loans from friends and family or grants less frequently used.⁴⁶ Public finance made available by EU institutions for buildings' renovations (e.g. ESIF, EFSI, and the ELENA facility) could provide the initial capital to reduce the risk profile of investments and help attract further private finance in the area of buildings' energy efficiency.

The EU heat pump market has been expanding at a 12% growth rate since 2015. In the EU, around 1.3 million households purchased a heat pump in 2018.⁴⁷ The high upfront costs of installing heat

⁴¹ International Energy Agency (2020b), World Energy Investment.

⁴² European Commission (2017), Smart Finance for Smart Buildings Investment Facility.

⁴³ European Commission (2019e), Comprehensive study of building energy renovation activities and the uptake of nearly zero-energy buildings in the EU.

⁴⁴ BPIE (2011), Principles for nearly-zero energy buildings.

⁴⁵ International Energy Agency (2020b), World Energy Investment.

⁴⁶ European Commission (2019e), Comprehensive study of building energy renovation activities and the uptake of nearly zero-energy buildings in the EU.

⁴⁷ International Energy Agency (2020c), Heat pumps tracking report.

pumps increase the sector's capital intensity, creating a substantial consumer finance market for investors to support households switching from fossil fuel heaters to heat pumps.

Larger investors can shift to financing the development of low-carbon infrastructure, leveraging the support of dedicated EU funds. Major investments will be needed in district heating and hydrogen infrastructure for low-carbon heat. Investors can play a critical role in financing the development of such technologies through demonstration projects and lowering their cost. Public finance in the area of low-carbon heat from EU sources such as the European Structural and Investment Funds can provide the initial capital to reduce the risk profile of investments, lower financing costs, and attract further private finance.

INDUSTRY DECARBONISATION

CURRENT SITUATION

The EU ETS is currently the main tool to decarbonise the EU's industrial sector, but it is insufficient to drive emissions reductions across industry. The EU ETS cap has not been tight enough to deliver carbon prices adequate to incentivise heavy industry to decarbonise.⁴⁸ GHG emissions from the industrial sector have decreased by 16.5% in the last decade and make up 10% of total EU emissions.⁴⁹

The 2010 Industrial Emissions Directive requires manufacturers to use 'Best Available Techniques', as specified in Best Available Techniques Reference Documents (BREFs) for a range of industrial processes. Some lists for specific technologies have been recently updated but many are outdated, such as the one on industrial cooling systems - last reviewed in 2001.

The Energy Efficiency Directive sets an overall EU energy efficiency target for 2030 of at least a 32.5% reduction relative to a baseline scenario, which will be reviewed in light of the increased EU 2030 climate ambition that has been proposed. Member states are required to indicate energy efficiency measures in line with the EU-wide target in their national energy and climate plans (NECPs).

In 2020 the EU has committed to developing and publishing strategies on low-carbon manufacturing for some steel and chemicals. In presenting its new Industrial Strategy for Europe, the EU has also recently expressed a new 'energy efficiency first' principle for industry, which will require investment in low carbon technologies, capacity and infrastructure.⁵⁰

⁴⁸ Carbon Market Watch (2016), A Guide to European Climate Policy.

⁴⁹ Eurostat Database (2020), Greenhouse gas emissions by source sector.

⁵⁰ European Commission (2020j), COM(2020) 102 final A new industrial strategy for Europe.

KEY POLICY RECOMMENDATIONS

- Substantially increase the level of ambition for decarbonising industry:
 - For the short term, fulfil the European Recovery Plan commitment for the new Strategic Investment Facility to invest in clean hydrogen and carbon capture and storage, funding demonstration projects in the steel, chemicals, and cement sectors.
 - For the longer-term, proceed with Industrial Strategy recommendations to develop and implement strategies on low-carbon steel and chemicals, and develop and implement a strategy on low-carbon cement. Strategies should set clear objective of decarbonising energy intensive industry by 2050. They should align to the new Clean Hydrogen Strategy committed to in the European Recovery Plan, and set out roadmap to shift to electric, hydrogen, and CCS production technologies to meet this objective.
- Update lists of best available technology supporting the Industrial Emissions Directive for all major industry sectors.
- Reform energy efficiency directive with industry sector efficiency target, recognizing 'energy efficiency first' principle in the New Industrial Strategy.

Industrial decarbonisation is likely to increase costs for many manufacturers, particularly for hard-to-abate sectors like steel and cement production, for which abatement costs are estimated at \$60 and \$110 per tonne respectively. Alongside policies like carbon pricing and regulations to drive decarbonisation, additional measures may be required to maintain competitiveness and avoid carbon leakage (e.g. through border carbon adjustment mechanisms), and mitigate any increases in costs or consumer prices (e.g. through subsidies, grants or tax exemptions).

Energy efficiency could reduce energy use in industry by around 25% by 2030, with around one fifth of this potential paying back within 5 years. ICF (2015) estimate that around 25% of European energy consumption in industry could be saved by 2030 through energy efficiency improvements.⁵¹ Government funding may be needed for energy efficiency investments using technologies with longer-term payback periods, as these might not be sufficiently attractive for private investors.

Higher industrial energy efficiency could lead to several benefits for the wider economy. Benefits may include reduced energy consumption and running costs, and improved competitiveness. Increased energy efficiency could also lead to job creation in the area of installation and monitoring of new energy efficient technologies.

ROLE FOR INVESTORS

As policy drives a shift from conventional to zero-carbon manufacturing, investment in conventional carbon-intensive manufacturing facilities, such as a coal-fired steel plant, will expose investors to risks repricing or early retirement of carbon-intensive assets. Investors could shift towards net zero opportunities in heavy industry to find long-term returns. These might include low-carbon

⁵¹ ICF International (2015), Study on energy efficiency and energy saving potential in industry and on possible policy mechanisms.

manufacturing processes in the steel, cement and chemicals sectors, as well as businesses deploying such processes.

Sustainable investors can adapt their portfolios to these new opportunities by investing in individual low-carbon assets in heavy industry, such as a new steel plants using CCS infrastructure. Investors may also carry out an overall reassessment of their portfolio composition, for example by differentiating between low-carbon and high-carbon manufacturing and rebalancing their portfolio.

Overall investment in energy efficiency in the EU was around USD 70 billion in 2018, with around USD 5 billion invested in industrial energy efficiency.⁵² Investment in energy efficiency could be required to more than double to 2030 in order to meet with a Paris-aligned emissions reductions.⁵³ Key investments include individual energy efficiency technologies, such as heat pumps for industrial applications, or the implementation of company-wide refits.

Investment in energy efficient businesses could raise returns on investment and protect investors from rising costs due to increasing wholesale energy prices or carbon prices. Investors may need to develop the necessary knowledge, tools and resources to properly appraise investment risk in energy efficient technologies. Such risks could be economic (e.g. a sudden increase development/construction costs), technological (e.g. a technology underperforming expectations) or regulatory (e.g. unforeseen changes in the framework of grants/subsidies).⁵⁴

KEY DATES

2020

- **October 15th 2020 - EU Council Summit:** Member States will hold an orientation debate on climate change-related issues, including the proposed 2030 target and the 2050 net zero goal.
- **December 10th 2020 - EU Council Summit:** agreement on EU Climate Law expected. EU Council and Parliament subsequently enter trialogue negotiations (date tbc).

2021

- **By June 2021** – proposed deadline for revision of key EU policies to implement new climate targets. It is expected that the European Commission will publish consultations on the policy revisions after agreement is reached on the Climate Law:
 - EU-ETS Directive (public consultation “[EU-ETS - updated rules for aviation](#)” is online now; deadline 14 Jan 2021)
 - Effort Sharing Regulation

⁵² International Energy Agency (2019b), World Energy Investment.

⁵³ International Energy Agency (2019a), World Energy Outlook 2019, Annex A.

⁵⁴ Hill, D. (2019), Energy Efficiency Financing: A review of risks and uncertainties.

- LULUCF Regulation
 - Energy Efficiency Directive
 - Renewable Energy Directive
 - CO₂ emissions performance standards for cars and vans
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- **Q2 2021 –**
 - Carbon Border Adjustment mechanism adoption
 - Energy taxation rules adoption

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