

Context is everything:

Insights and lessons for
successfully delivering the
European Green Deal

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Executive summary

The purpose of this report is to provide insights to EU, national and local decision-makers and stakeholders seeking to implement the EU Green Deal and deliver the transition to a more sustainable EU economy. The report does this by analysing policies that seek to directly incentivise European households and businesses to make more sustainable choices (such as subsidies for electric vehicle (EV) purchases) alongside contextual factors that influence the decision-making processes and the viability and relative attractiveness of the more sustainable choices.

This is a crucial moment for the EU to develop and implement the policies and plans needed to address the multiple crises we face. These include the climate and cost of living crises, biodiversity protection, energy security, and the need to develop a more inclusive, competitive and growing economy.

This is also an important moment for political negotiations on the Green Deal. EU decision-makers are finalising the Fit for 55 Package aimed at achieving the EU's enhanced 2030 targets, while also working to deliver the REPowerEU plan. At the same time, national authorities must update their National Energy and Climate Plans (NECPs), which set out how they will deliver the policies needed to implement these ambitious EU targets.

Policies that seek to mitigate greenhouse gas (GHG) emissions and limit the environmental impact of human activity do not exist in isolation. Instead, their ability to instigate change is influenced by the contextual conditions within which they are introduced, as well as their detailed design. Their effectiveness is also impacted by how well the different policies support each other in creating synergies that generate a degree of change that is greater than could be achieved in isolation.

This report shows that creating enabling conditions for successful policy delivery plays a crucial role in their ability to create more sustainable societies. A strong, ambitious and coherent climate policy framework must go hand in hand with the creation of enabling conditions that encourage households and businesses to make more sustainable choices.

Climate and sustainability policies often seek to change the way that individuals, households, businesses and public sector institutions and authorities produce, consume or deliver goods and services. These include choices over technologies they use in homes, office spaces, schools, hospitals and production facilities.

In this report, we draw on the existing literature and real-world case studies to show how different contextual factors interplay with each other and climate policy measures, thus affecting their outcomes. We focus specifically on practices, behaviours and choices linked to:



Buildings

including heating, cooling, water heating, lighting, and energy efficiency



Energy

including on-site renewables deployment and the shift away from fossil fuels



Transport

including mobility choices and EV uptake



Circular practices

such as packaging of household consumables, recycling, and waste

The analysis and case studies can help national and local policymakers to better understand how, by taking into consideration the prevalent contextual factors and seeking to change them where necessary, they can design and implement policies to deliver positive climate outcomes while also improving public acceptability.

Overall, the evidence suggests that **the best outcomes for policies seeking to incentivise more sustainable behaviour are achieved when their goals are aligned with both the broader policy context and different governance levels.** A well-designed mix of financial incentives or disincentives and regulatory measures need to work together to simultaneously incentivise a certain choice. A combination

of measures to support a certain sustainable choice will increase its relative appeal and make it more easily available and accessible to large numbers of consumers. Initiatives such as one-stop advice shops can also be very helpful, especially in supporting complex interventions, such as energy efficiency retrofits.

Although policy design and implementation are extremely important considerations, good policy design alone does not guarantee success. Contextual factors such as income levels, cost of cleaner energy options and low carbon technologies, strength of governing institutions, consistency of policy frameworks and access to information and infrastructure influence people's *ability* to make sustainable choices. Social norms, exposure to new technologies, peer-to-peer communication and general awareness, on the other hand, play an important role in determining their *willingness* to adopt less carbon-intensive technologies and behaviours.

Factors that influence the *ability* and *willingness* of consumers and businesses to make more sustainable choices need to be considered to maximise the effectiveness of climate and sustainability policies. Addressing only one set of contextual factors, such as improving infrastructure but doing nothing to change people's awareness and shared perceptions of active transport, may not be enough to create enabling conditions that facilitate policy success.

When planning and implementing a subsidy scheme, clearly stated eligibility criteria and step-by-step guidelines for how to apply for funding are crucial to ensure a high level of uptake. Engagement levels are also impacted by how extensive subsidies are, what specific measures or technologies they cover, eligibility criteria, complexity of the application process, implementation period and how well the policy is publicised. A UK buildings sector case study illustrates how without these factors a scheme may be unsuccessful. An Italian example, on the other hand, showcases how opposite results can be achieved.

The analysis and case studies indicate that better outcomes can be achieved when EU and national-level targets allow local and municipal governments to tailor policy instruments. For example, a national framework that supports municipalities through targeted funding to cut emissions could be tailored to enable them to scale up innovative local solutions. Such approaches can enable local authorities to address specific local challenges in a manner that is meaningful to residents and improves their quality of life. A case study on a street lighting scheme in Poland shows how this has reduced emissions and expenditure, while improving safety.

In conjunction with the need for a co-ordinated, multilevel, governance approach, the report highlights how policies and initiatives to reduce emissions can benefit from well-resourced and co-ordinated institutions, solidarity and a high level of trust.

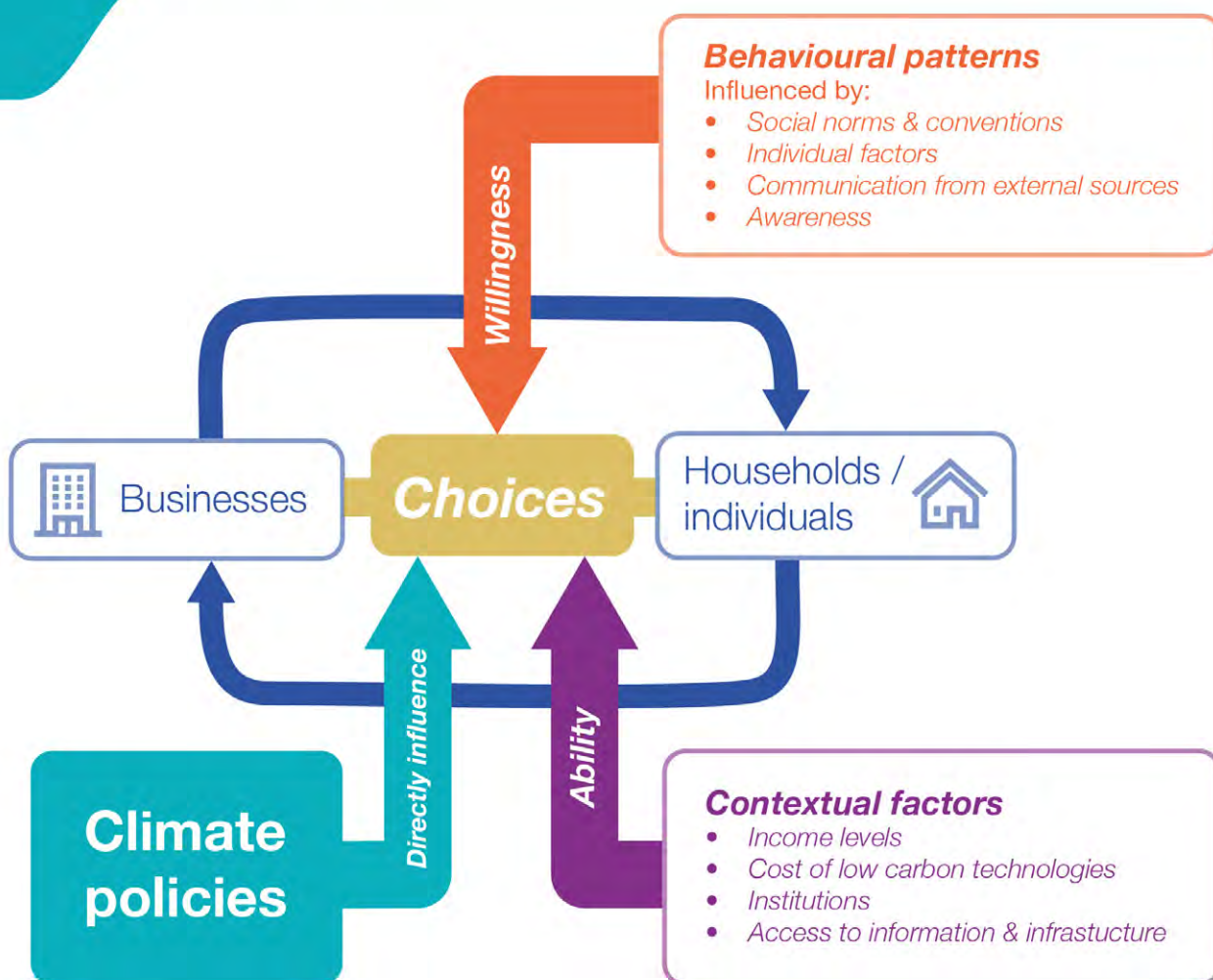
The importance of these factors is illustrated through beverage bottle return schemes (case study 9) and renewable energy communities (case study 6). In both cases, success has been achieved in contexts characterised by supportive and clear policy frameworks, strong institutions, and high levels of social capital and environmental consciousness.

There is strong evidence to suggest that stakeholder consultation and involvement prior to implementation can be a key factor determining policy acceptability and success. A case study from Estonia reveals how the removal of charges for public transport was not successful in reducing private car use, partially because it only addressed affordability constraints without considering other factors for high levels of private car use. Conversely, high levels of stakeholder consultation and engagement were key factors in facilitating the success of voluntary GHG mitigation and offsetting programmes in Catalonia.

The unprecedented changes needed to achieve the global 1.5°C target in the Paris Agreement require changes to household and business operations. In some instances, cultural change and the adoption of new practices require multiple actors to agree to the creation of a 'new normal' and to dedicate resources to drive these policies. This is illustrated in a case study on a Deposit Return System (DRS) for single-use beverage packaging. Although the concept is widely supported by governments, European drinks producers and trade associations, to date it has succeeded predominantly in countries where the 'bring-back' culture is well established, and retailers are set up to actively participate in the recycling of beverage packaging. In the absence of efforts to bring stakeholders on board, such as government support for retailers, regulation mandating a DRS-style initiative is unlikely to be positively received. With that support it can be a useful and effective policy to support circularity of some packaging types.

As the debate over EU policies moves from target setting to implementation in this decade, this report stresses that there is a 'once in a lifetime opportunity' for the EU to develop policies that encourage businesses and households to make sustainable choices, while increasing the prosperity of Europeans and providing opportunities for economic growth and job creation.

Contextualised approach to delivering successful climate policy outcomes



Best climate policy outcomes are achieved through:

- Coherent policy alignment
- Local tailoring of policy instruments
- Measures that support a common goal
- Well-resourced, empowered, coordinated institutions
- Effective policy design
- Engaging and listening to stakeholders
- A clear, well-communicated vision

To achieve the EU's climate and energy ambitions, we need well-designed national and local policies that take into account the *ability* and *willingness* of households and businesses to make more sustainable choices.



Introduction

Moving from target setting to policy implementation

The EU's vision for the European Green Deal is for it to transform the continent into a modern, resource-efficient and competitive economy.¹ This has significant implications for policies across climate, energy, environment and beyond.

As the flagship initiative of the European Green Deal, the EU has set the target of achieving climate neutrality by 2050 and has increased its 2030 climate target to “at least 55%” net emission reductions by 2030. In July 2021, the European Commission published the so-called Fit for 55 Package, a comprehensive set of climate and policy legislative proposals, to implement the enhanced 2030 targets.

While the negotiations between EU decision-makers to finalise the Fit for 55 Package were ongoing, the European Commission also published its REPowerEU plan in response to Russia's war against Ukraine, setting out plans to reduce the EU's reliance on the country's energy exports. The plan proposes further increases in renewable energy and energy efficiency targets, and requires a timely and effective revision of Member States' National Energy and Climate and Recovery Plans to accelerate the EU's clean energy transition.²

These interlinked policy developments bring the EU to a historic crossroads. Ambitious, coherent and efficient 2030 climate and energy targets need to be set in parallel to developing national and local policies and plans to implement the EU targets, while also addressing the ongoing energy and cost of living crises.

Otherwise, the EU might face a critical implementation and delivery challenge. In 2020, the European Commission's assessment of national plans to implement the EU's previous 2030 targets has shown that while Member States were overshooting the renewable energy targets, there was a clear gap in the energy efficiency sector.³ Amid the enhanced EU 2030 climate target and the worsening energy crisis, energy efficiency and the energy performance of buildings have become more important than ever. The EU urgently needs to deal with this implementation gap while also rapidly scaling up action.

Addressing the challenges to implementation is urgent, both for businesses and consumer trust in EU energy and climate policies, and for their ability to deliver change and tackle the intertwined crises affecting people and the environment.

One key consideration for effective policy design and implementation is that measures to reduce GHG emissions and to accelerate the clean energy transition need to be delivered within a broader context, which is influenced by policies across various government departments and levels of governance. The European Green Deal and the Fit for 55 Package influence many different policy areas including wellbeing, quality of life, pollution, environment, economic growth, employment and social inequalities. However, they do not cover all sectors of the economy or include broader socioeconomic policies (such as fiscal policies, housing policies and local transport provision), that affect the successful implementation of policies designed specifically to reduce emissions and pollution.

The contextual conditions, determined by other policies and socioeconomic conditions, can have a huge impact on the willingness and ability of consumers and businesses to make more sustainable choices, thus impacting the outcomes and effectiveness of climate policies. Misalignment between climate and environmental policies and other policies such as fiscal, housing and transport, can make it more expensive, difficult, less appealing and potentially even impossible, for some climate policy instruments to be effectively implemented.

In this report, the concept of **‘harmonised policy response’** refers to two key issues:

- **the need to ensure that different climate and environmental policies reinforce (rather than contradict) each other**
- **the need to ensure that contextual conditions support successful implementation of climate and sustainability policies.**

We explore how, under the current conditions, to best create a supportive context and enabling conditions for successful delivery and implementation of climate policies. **This includes the challenge of improving the EU's energy security and addressing the cost of living crisis in a manner that facilitates the decarbonisation of EU economies.** Such measures are essential to ensure that efforts to mitigate one crisis do not inhibit progress elsewhere. Certain approaches, such as those that focus on improving energy efficiency, reducing demand for electricity by updating older technologies to more efficient alternatives and facilitating a switch to greater use of renewable energy could have multiple benefits by lowering energy bills, improving energy security and reducing GHG emissions.

Methodology and structure of the report

The study was designed as a literature review encompassing academic and grey literature, complemented by two rounds of stakeholder workshops to discuss interim findings and collect feedback, alongside case studies. The research questions and further details of the methodology are available in Appendix.

The scope of the study is focused on the following sectors:



Buildings

Heating, cooling, water heating, lighting, energy efficiency



Energy

On-site renewables deployment, shift away from fossil fuels



Transport

Transport mode choices, EV uptake



Circular practices

Packaging of household consumables and food, food waste

Objectives

The study has three key objectives. The first is **to identify the key types of policy measures that seek to directly influence the choices that individuals, households and businesses make in terms of what and how they purchase and consume.** These policy measures, which include direct support, such as subsidies to purchase zero emission technologies and regulatory measures that impact either on the choices that are available for consumers or their relative appeal, are outlined in **Section 1**. In this section, we

also briefly discuss the shortcomings and limitations of some policies and how their effectiveness could be enhanced or compromised by contextual conditions.

The second objective of the study is **to explore how contextual factors can impact the ability and willingness of individuals, households and businesses to make sustainable choices as well as their relative appeal.**

The enabling and disabling contextual conditions that may impact the *ability* of individuals, households and businesses to make more sustainable choices include factors such as wealth, access to information and infrastructure. These are discussed in **Section 2**.

However, access to infrastructure and information, coupled with subsidies and other economic incentives and disincentives, may not be enough to encourage and achieve large-scale behaviour change. Additional factors such as social norms and conventions, peer-to-peer interactions, communication and awareness, are also important because they influence people's *willingness* to change their behaviour and make more sustainable choices. These are discussed in **Section 3**. Better understanding of climate change combined with information regarding the impact that more sustainable choices can have, as well as their co-benefits, can radically improve people's willingness to change their behaviour.

The third objective of the study is **to provide examples of existing policy and business action** to illustrate how the impact of climate policy can be enhanced/accelerated. The business case studies are distributed across the report to provide practical examples of how certain policy interactions have facilitated or hindered sustainable action. Policy case studies from various European countries are presented in **Section 4**.

These case studies illustrate how the contextual conditions impacting the *ability* and *willingness* to make sustainable choices have interplayed with climate and sustainability policy measures, thus affecting their outcomes. These include examples linked to buildings, transport, renewable energy and circular practices. They showcase:

- instances where contextual conditions were supportive of a specific policy instrument, enabling it to achieve or exceed its objectives
- contextual conditions that hindered the effectiveness of a climate policy instrument, thereby reducing its effectiveness
- how policies can be designed and implemented to remove barriers to effective policy implementation.



Section 1

How do climate policies seek to influence household and business choices?

This report focuses on policy instruments designed to reduce GHG emissions, pollution and adverse environmental impacts of human activity across four specific sectors: buildings, energy, transport, and circular practices.

Many of these measures are typically referred to as ‘climate policies’, a term we use in this report for the sake of clarity and simplicity. However, some of the policy instruments included in this study, especially those in relation to circular economy and transport, also have strong environmental objectives that extend beyond the regulation of GHG emissions.

Policy instruments that seek to directly influence households’ and businesses’ decisions can be grouped into two broad categories: (1) Financial/economic instruments; (2) Regulatory instruments.

1.1 Financial/economic instruments

Economic instruments, such as financial and fiscal incentives and disincentives, are frequently used to influence consumer behaviour. These typically take the form of direct subsidies or tax exemptions and can be designed to reduce the upfront investment that is needed to purchase a more sustainable product, such as EVs, compared to a current technology, such as an internal combustion engine vehicle (ICE). Economic instruments can also be applied to reduce the operating costs of the more sustainable choice, for example, via road tax exemption or provision of free parking in cities for EV users.

Economic disincentives typically take the form of penalties applied through taxation to reduce the relative appeal of a current, cheaper, but more polluting or carbon-intensive product, such as fuel duties applied to petrol and diesel.

Economic disincentives can also be applied at a larger scale to increase the cost of dirty fuel consumption and incentivise a switch to cleaner energy, through measures including carbon taxation.

Economic disincentives are widely applied in many economies within the EU and elsewhere, and plans to extend them further have been proposed as part of the reform of the EU’s Energy Taxation Directive (ETD). However, economic disincentives tend to attract criticism and public opposition because of their potential regressive distributional impacts.⁴ Events such as the *gilets jaunes* riots,⁵ which took place in France in 2018 in response to President Macron’s plans to increase taxes on petrol and diesel to reduce France’s national emissions, illustrate the importance of careful planning and implementation, including the introduction of accompanying measures to protect vulnerable consumers or businesses when new economic disincentives are first announced. This risk is particularly high if the economic disincentives increase the cost of essential goods or services, especially in contexts characterised by high income inequalities.⁶

Despite the potential backlash, particularly against some of the more controversial economic disincentives, there are many examples where financial and fiscal policy interventions have been successfully applied to encourage consumers and businesses to make more sustainable choices.

In the **transport** sector, direct subsidies for light duty EVs have been found to be effective in increasing uptake in various national contexts.^{7,8} For example, Norway has achieved the highest rate of EV uptake in the world due to a combination

*Further details and drawbacks of the Norwegian example can be found in the ‘Case studies’ section.

of generous subsidies for new purchases and several tax and toll exemptions.^{9*} However, as discussed later in this report, the EV uptake, including the effectiveness of the financial and fiscal incentives, has generally been greater in countries where certain contextual factors support their implementation. These include high median income and high taxes, which improve the general public's purchasing power and the increased financial reward that can be derived from tax exemptions.

Environmental taxes, such as those levied on vehicles, fuels and roads, congestion charges and the suspension of fossil fuel subsidies have also played an important role in reducing road transport emissions^{10,11} In the aviation sector, it has been suggested that a passenger tax could potentially help moderate emissions.^{12,13}

In the **renewable energy** and the **buildings sectors**, subsidies and feed-in tariffs have been effectively used to reduce uncertainties and motivate households and businesses to install renewable energy sources.¹⁴ Subsidy systems have, in certain contexts, encouraged households to undertake retrofit projects and replace inefficient or fossil-based heating and cooling systems with more environmentally friendly alternatives.¹⁵ Increased uptake, in turn, has brought down the price of many of these newer, more sustainable technologies, such as solar panels. However, the upfront cost of energy efficiency renovations and heat pumps remains high, meaning that additional measures, aimed specifically at low-income households, may be needed to ensure that the benefits from these subsidies are not only felt by households able to invest in the necessary renovations.^{16,17} This is a key issue, especially where the shared cost requirements for those in receipt of subsidies are high and not linked to household income or wealth.

Higher taxes on more carbon-intensive, or polluting, fuels can also incentivise the take-up of renewable energy technologies.^{18,19} For example, in Germany, the national Emissions Trading System puts a price on GHG emissions within the heating and transport sectors. The revenue from this tax is then invested by the government in measures to support climate-friendly transport and heating solutions, promoting renewable energy in the transport and buildings sectors.²⁰

However, as mentioned above, taxes on polluting/carbon-intensive heating fuels are subject to controversy, especially amid the current cost of living crisis. Indeed, many consumers and consumer protection groups oppose the proposed changes to the ETD and extension of the EU's Emissions Trading System (ETS) to buildings and transport (also known as ETS2), on the grounds that too many European households and businesses already struggle with the cost of living and the current energy prices.^{21,22}

In the current context characterised by fears over the rapidly increasing cost of basic essentials, economic and financial incentives are likely to be regarded more favourably than penalties. There are some examples of how these have been used to encourage more **circular practices**, such as in 2017

when Sweden cut the value-added tax (VAT) for certain repair services, thereby increasing the number of repairs and consumers' willingness to engage with more circular practices.²³ Another example in the EU is the Extended Producer Responsibility (EPR), a regulation which extends the producer's responsibility, obliging them to take care of the treatment or disposal of their products in the post-consumer stage.

France created an innovative EPR scheme for furniture waste in 2012, covering both household and professional furniture waste. The scheme is intended to generate over EUR300 million a year by facilitating greater furniture reuse and recycling. It is also expected to create jobs and new business opportunities around furniture waste management – leading to the creation of new companies, including in relation to mattress and wood recycling, which were not profitable before the scheme.²⁴

1.2 Regulatory instruments

It is widely acknowledged that various types of regulatory instruments will be needed to meet the 1.5°C Paris Agreement climate target.²⁵ This is particularly relevant where market incentives are weak or counterproductive.^{26,*}

From a business perspective, rapid technological development can make it difficult for companies to decide which technology to use and how to make investment decisions.²⁷ Regulation can therefore play a key role in setting a clear direction of travel, increasing investor confidence, reducing risks and facilitating faster transition to more sustainable choices. However, regulation can also be influential in creating markets for low carbon products and materials that are less well known or more expensive than more carbon-intensive alternatives.

Regulatory instruments can take two different forms:

1. New regulations that place limits, or requirements, on energy efficiency, or embodied or operational emissions, to enforce more sustainable production and consumption practices. Such regulatory limits can be supported by mechanisms that remove certain polluting or wasteful products from the market as the limits are strengthened. Regulation that bans the advertising of the most polluting vehicles and other products could also be an efficient tool to increase the relative visibility of more sustainable choices.^{28,29}
2. Amendments to existing regulations and standards to facilitate market access and upscaling of new, innovative, sustainable technologies, materials, production methods and practices.³⁰ These are especially needed when certain specifications act as a barrier to innovation and the development of low carbon alternatives.³¹

*See 'Case studies' section about policies incentivising wooden construction.

It is important to note that regulations have their limitations as most are only applied at one specific point in the value chain or are one of many elements within a complex process. For example, regulations obliging white goods manufacturers to provide information about the energy efficiency of their products do not mandate consumers to buy the most effective appliance. Likewise, a requirement for municipal authorities to implement measures to facilitate and incentivise more sustainable practices does not oblige residents to take advantage of any legally mandated provisions. However, there are many examples of how regulatory instruments have been successfully applied to accelerate the adoption of low carbon products and behaviours.

In the **transport sector**, CO₂ emission performance standards for cars and vans³² have been successful in removing more polluting vehicles from the market, and the latest round of proposed amendments would see the sale of new ICE's banned within the EU by 2035. Amendments to existing rules, such as extended access to special lanes initially designed for public transport, have also been successfully applied to improve the relative appeal of EVs and new practices, such as car-pooling, especially in metropolitan areas and big cities.^{33,34,35} Low-emission zones and free parking for EVs have likewise been effective in reducing conventional car use.³⁶

Additional regulations are being introduced to ensure the availability of charging infrastructure to reduce barriers to the adoption of cleaner transport fuels, including for heavy duty vehicles. Among these are proposed revisions to the EU's Alternative Fuels Infrastructure Directive (AFID), which obliges Member States to improve the availability of some alternative fuels in line with the Trans-European Transport Network (TEN-T) Core Network policy. These include electricity and compressed natural gas (CNG) for vehicles and liquefied natural gas (LNG) for vehicles and maritime and inland waterway vessels.³⁷

In the buildings sector, minimum energy performance requirements can deliver substantial emissions reductions, either on their own or in conjunction with carbon tax.³⁸ To date, mandatory requirements have been used primarily to reduce **operational emissions from buildings**. All new or renovated buildings must now meet certain energy efficiency criteria and the use of certain heating fuels has been addressed through the implementation of air quality standards.^{39,40,41} Further amendments to building standards, such as limits on embodied carbon content or the requirement to incorporate EV charging points in new dwellings and non-residential buildings, could foster green transition in other sectors and enhance greater circularity, in addition to creating demand for low carbon building materials.⁴²

Mandatory energy efficiency labelling and maximum limits for acceptable energy use of products can reduce emissions as this removes the least efficient products from the market. For example, EU regulation for electronic devices, introduced in 1994 and subsequently expanded in 2004, will have abated approximately 230 million tonnes of oil equivalent

by 2030, providing an estimated EUR285 annual energy bill reduction for an average European household.⁴³

Regulations can also be implemented to incentivise **greater circularity** and create new opportunities for market entry for innovative products. Regulations fostering circularity of household appliances can create markets for more sustainable products.^{44,45} The Circular Electronics Initiative aims to ensure that electronic devices are designed for durability, maintenance, repair, disassembly, dismantling, reuse and recycling, by granting consumers the 'right to repair' them.⁴⁶

Regulations can also incentivise greater material efficiency and recycling. The revised EU rules on industrial emissions include measures to boost the effectiveness of production processes in economic sectors with the goal of improving energy, water and material resource efficiency and reuse alongside, removing less efficient products from the market.⁴⁷ The EU's Packaging and Packaging Waste Directive has set new recycling targets, including a baseline goal that by December 2025, at least 65 per cent by weight of all packaging waste must be recycled. This increases to 70 per cent by December 2030 and includes further recycling targets per material.⁴⁸

Regulations mandating manufacturers and property developers to provide information on the embodied carbon content of their products could also accelerate greater use of recycled materials and improved material efficiency. However, these types of regulations require better data collection, reporting and sharing across value chains than is currently possible.⁴⁹ The European Commission's proposal for a new Ecodesign for Sustainable Products Regulation (ESPR) is the first step towards creating the right conditions to enable the setting of performance and information requirements for several categories of goods within the EU market.⁵⁰

Recycled content requirements provide another example of how regulation can incentivise greater circularity. In Switzerland, regulation setting a minimum level for the use of recycled, non-concrete, mineral materials in concrete has resulted in an increase in products containing a higher proportion of recycled materials.⁵¹ However, in the EU, the use of recycled materials in concrete production remains largely banned (or restricted to a maximum of 10 per cent as in Finland) due to old regime requirements.^{52,53} Although EU rules may change when the Construction Products Regulation⁵⁴ is revised, this example highlights how certain existing standards hinder more circular practices that have high emissions reduction potential.

The business case study below highlights how regulations can shape and push business decisions towards more sustainable forms of operation.

Business case study

Rethinking packaging: towards zero plastics⁵⁵

As part of its 2030 Sustainability Strategy, the VELUX Group aims to green its packaging for both windows and accessories, making it not only zero plastic, but also single material and 100 per cent recyclable by 2030. To achieve this ambition, in 2020, VELUX, in close collaboration with its suppliers, started to adjust its product packaging from a mix of paper/cardboard-based materials and single-use plastic to solely paper/cardboard.

A number of factors drove this initiative to simplify the packaging, including local sorting requirements, Extended Producer Responsibility schemes as part of the Packaging and Packaging Waste Directive, and a strong push towards a more circular construction sector and the elimination of single-use plastics across Europe. Cardboard and biogenic fibre-based solutions were chosen to replace the plastic as they are easier, more efficient and cost-effective to recycle. Cardboard can be recycled multiple times, and requires less sorting and separation for customers, enabling them to dispose of it in one go. In addition, many Member States have better established recycling systems for cardboard than for expanded polystyrene (EPS) and other plastics.

Through the strategy, VELUX has managed to replace the packaging for 90 per cent of its sloped-roof windows with a paper-based single material alternative made from Forest Stewardship Council (FSC) certified cardboard, saving approximately 900 tonnes of plastic per year. Through this initiative, VELUX is reducing the overall carbon footprint of its packaging by approximately 13 per cent.



Credit: VELUX Group. Going zero plastic packaging by 2030.



Section 2

Contextual factors that enable or hinder sustainable choices

Economic incentives, disincentives and regulatory measures have the potential to achieve positive climate outcomes. However, these mechanisms are most impactful when applied in a harmonised manner to support and enforce one another. The effectiveness of these policies is also influenced by contextual factors that impact on the ability of individuals, households and businesses to make more sustainable choices and the relative appeal of these alternatives. These include the state of the economy and income, regulatory frameworks and institutions set up to enforce them, as well as access to information and infrastructure that enables sustainable choices.

2.1 Financial and socioeconomic aspects

Most households and businesses occupy buildings that are not very energy efficient and use technologies that consume fossil fuels for space and water heating. Although cleaner, more efficient, electric alternatives have been available for over a decade, switching to these technologies often requires considerable capital investment. This is largely due to the fact that lower production volumes mean that the per-unit cost of many newer, electric, technologies remains higher than for fossil fuel alternatives to date.

To influence the uptake of greener choices for households and businesses, there are two key financial aspects to consider:

1. The relative price of cleaner technologies (heat pumps, electric water heating systems, EVs, windows with high thermal efficiency) compared to fossil fuel using alternatives.
2. The relative price of (green) electricity compared to fossil fuels, which influences the operating costs.

In section 1.1 of this report, we discussed how policy instruments can be utilised to reduce the upfront investment of households and businesses to purchase some of the more expensive but more sustainable technologies, such as heat

pumps and EVs. However, the availability of subsidies is not the only factor that influences the ability of households and businesses to choose these low carbon technologies.

Vogel et al.⁵⁶ identify two types of factors which either support ('beneficial provisioning factors') or deter ('detrimental provisioning factors') more sustainable consumption practices. The relatively high upfront cost of more sustainable heating and water-heating solutions is a prime example of a detrimental provisioning factor. Households and businesses are unlikely to replace capital-intensive devices, such as boilers, until they break down or are no longer fit for purpose as renovation typically requires significant investment in addition to causing disruption and inconvenience. These factors are particularly relevant if no financial incentives are in place.

When the urgent need to replace a failing technological appliance emerges, a cheaper option requiring less up-front investment is often more appealing, or the only financially viable choice. This creates a vicious circle where the higher cost limits demand for new low carbon technologies, preventing them from reaching cost parity with the current (fossil fuel) technologies, especially if their uptake is not subsidised. The greater the cost difference, the higher the subsidies need to be to increase the relative appeal of the new technologies.

At present, the adoption of more sustainable technologies has been impacted by the energy price crisis, which has kept the cost of running electric devices comparatively high. Although the current energy price crisis is caused by rapidly increasing wholesale gas prices, the fact that electricity prices are determined by the cost of gas means that they are also rapidly increasing. In some instances, the increase in electricity prices has been greater, in absolute terms, than that of gas, further reducing the relative appeal of electric technologies.

Higher energy bills also reduce the disposable income of especially low-income households and many small businesses, deterring them from investing in fuel switching or energy efficiency improvements. Although some businesses may seek to improve energy efficiency, particularly if this will substantially reduce their production costs, many producers need to pass the growing energy costs on to consumers through higher product prices, further contributing to inflation.⁵⁷ Households and businesses with higher disposable incomes have a growing incentive to invest in on-site renewable energy technologies, such as solar panels, to reduce their dependence on increasingly volatile electricity from the grid. On-site renewable generation capacity will also increase the relative appeal of heat pumps and EVs for these businesses and households.

However, the abundant availability of low-cost fossil fuels can be yet another detrimental provisioning factor, reducing the appeal of investing in on-site solar by households and businesses. Fossil fuel extraction activities and a robust coal industry, especially if accompanied by fossil fuel subsidies, can significantly slow down the green transition by ensuring that fossil fuels are widely available and at a relatively low cost. This applies to major coal-producing countries such as Poland, China and Russia, where domestic coal resources are substantial, the coal industry provides large numbers of jobs, and it plays a significant role in primary energy consumption.⁵⁸

Business investment in breakthrough technologies is also influenced by the associated risk which is often reflected in the cost of debt financing. Many of the technologies essential in reaching climate goals are not yet available at market scale, making them risky investments. Some beneficial provisioning factors can be implemented to help reduce the risk. Carbon Contracts for Difference (CCfDs) are widely used to incentivise more investment in renewable energy generation technologies by ensuring that the electricity from these projects is sold at a price that is profitable, regardless of electricity market volatility. As a result, CCfDs have reduced investment costs and increased the supply of new projects.⁵⁹

The business case study below illustrates how the EU taxonomy can be seen as a beneficial provisioning factor and shows how it can support the business case for projects enhancing energy efficiency.



Business case study

ACCIONA's headquarters: how the EU taxonomy guided sustainable business investment in a built environment project

ACCIONA's future headquarters, the ACCIONA Campus, in Madrid, showcases how EU regulations can provide meaningful guidance for business projects to decarbonise the built environment. The ACCIONA Campus project started in 2019, with significant decarbonisation and sustainability goals in place. However, the original targets were strengthened following the publication of the EU Taxonomy Delegated Act and technical annexes (2020–21).

During the consultation phase on the EU Taxonomy, ACCIONA partnered with the Green Building Council in Spain (GBCe) on a pilot project exploring the future alignment of building projects under the Taxonomy requirements, using the Campus buildings as examples. ACCIONA specifically considered the Taxonomy's requirements over the construction of new buildings (chapter 7.1) and the renovation of existing buildings (chapter 7.2), as the Campus features both.

Implementing the EU Taxonomy criteria enabled the company to enhance the energy efficiency requirements of the Campus' buildings as well as the percentage of renewable energy installations compared to the original project. ACCIONA also developed specific performance tests and reports during the construction phase, to ensure compliance with the criteria.

In addition to the decarbonisation scope, the Taxonomy requirements guided the company's choices in:

- waste management, through working with the construction supplier to reuse materials
- efficiency of water devices, to achieve the Top 2 Water Class Label
- circularity performance of the buildings, through monitoring materials and drawing on the Building Information Modelling (BIM) methodology
- environment and biodiversity, through a specific environmental control plan and biodiversity study to improve the landscaping project
- Social Impact Management (SIM), based on the minimum social safeguards with specific management systems developed in-house
- all the previous points with a re-regenerative scope, enhancing the previous responsibility/resilience approach.

ACCIONA considers alignment with the EU Taxonomy a necessity within the business case for such projects and is working to mainstream the Taxonomy's requirements at the inception stage of future projects to reduce any additional costs. As the Mesena Campus project illustrates, the Taxonomy covers several areas including energy demand and waste reuse/savings but, in the company's view, could usefully include additional guidelines on circularity (ISO 20887) and the protection of water resources.



General plant view of the Campus

Credit: ACCIONA



Visitors centre



External areas

2.2 Institutional aspects

One of the most widely analysed contextual factors examined is the importance and quality of institutions. The Organisation for Economic Co-operation and Development's (OECD) work on policy coherence formulates useful recommendations for how to consistently develop and implement coherent, multilevel policies. The study presents eight principles under three main pillars on how to enhance policy coherence for sustainable development. These are:

1. A strategic vision for implementing the 2030 Agenda underpinned by a clear political commitment and leadership to enhance policy coherence for sustainable development.
2. Effective and inclusive institutional and governance mechanisms to address policy interactions across sectors and align actions between levels of government.
3. A set of responsive and adaptive tools to anticipate, assess and address domestic, transboundary and long-term impacts of policies.⁶⁰

Institutional quality refers to law, individual rights, government regulation and services. **High institutional quality** can play a key role in supporting climate-related policymaking. However, low administrative and institutional capacities often mean that even low-cost opportunities, or technologies, cannot be extensively deployed even when new infrastructure is built.⁶¹ In general, countries with low institutional quality are less able to implement complex climate policies, such as feed-in tariffs or carbon taxes,⁶² or to enforce regulatory requirements, such as energy efficiency standards.⁶³ Consistency in government approach to climate and environmental issues, including a policy framework that sets out a clear direction of travel, is also important to reduce uncertainty (which can disincentivise investment in sustainable technologies) among households and businesses.

The lack of **democratic norms** can undermine the effectiveness of climate policies. Even short-term autocratic regimes can have an adverse effect in the longer term.⁶⁴ However, democratic governance can in some ways make it more difficult for governments to push through major climate policy reforms because vested interest groups have the legal right to campaign for their causes. Incumbent industries with significant economic weight and resistance to change can be particularly powerful actors in creating barriers to effective climate policy and slowing down efforts to implement more ambitious regulations.

Prevalence of **corruption** and low level of **social trust** are also associated with unsuccessful reforms of fossil subsidies and carbon tax stringency. Low levels of social trust weaken the effectiveness of climate policies as individuals and businesses are not engaged and do not believe that others will adhere to the policy. Conversely, high levels of **social trust** are linked to better climate awareness and lower levels of corruption, thus performing an enabling role for successful implementation of climate policies.^{65,66}

Although not always the responsibility of public sector institutions, limited **accessibility of services or materials** can reduce the ability of households and businesses to choose sustainable products and materials. Long waiting times for energy efficiency audits and boiler inspections, caused by limited availability of accredited service providers, can slow down the green transition within the buildings sector.⁶⁷ Administrative barriers and lacking institutional capacities may deter consumers from investing in technologies to reduce energy demand.⁶⁸

2.3 Access to information

Access to information and the ability to process this information can be influential in shaping the decisions that households and businesses make.

In consumer-facing operations, distribution of information on a product's environmental impact or energy efficiency, through rating or labelling, can encourage consumers to make more sustainable choices when choosing specific household appliances or building energy efficiency measures.⁶⁹ Labelling can be effective if it incentivises consumers to look beyond the price tag and consider the longer-term operational emissions of their purchases, or when it is supported by regulatory requirements that remove the least efficient products from the market.

Mandatory carbon or energy labelling methodology, similar to European energy efficiency labelling of electronic devices, could help provide better access to easily comparable information for consumers, influencing their choices. A 2019 study found that 79 per cent of consumers took energy labels into account when purchasing new electrical devices.⁷⁰ In future, labelling and rating requirements could be extended from the energy efficiency of buildings and household appliances to embodied carbon labelling of household appliances, cars, fuel, textiles and other materials.^{71,72,73,74}

A lack of clear and coherent information will hinder the ability of individuals, households and businesses to understand how they could make more sustainable choices and what support is available. High-quality, clear and concise information is especially important where economic incentives are concerned.^{75,76}

Limited information for businesses and consumers can make it harder for countries to meet national climate targets, despite subsidy schemes being in place to encourage the adoption of more efficient and sustainable technologies. A large-scale switch to more efficient household appliances (ovens, televisions, electric appliances and white goods) and lighting could generate electricity savings of more than 16 TWh (if switching from halogens to LED) and 6.4 TWh (if switching from incandescent to compact fluorescent) in British homes.⁷⁷ In Italy, replacing inefficient and old street lighting, often also associated with safety concerns, could reduce operating costs by a third while also improving safety and comfort.⁷⁸ In addition, converting all lighting segments to LED would save 32 TWh, representing more than 50% of the electricity generated by Russian gas in the country.⁷⁹

Lack of labelling, or incomparability of product information and limited public awareness on how to interpret the information, makes it difficult, even for environmentally aware consumers, to differentiate products based on their carbon footprint. Complicated eligibility criteria and the presence of various, often short-term, local and poorly publicised, subsidy schemes can make it challenging for households and businesses to understand what type of support, subsidies or tax exemptions are available.

Ratings and labelling must be easy to understand and provide information that enables consumers to accurately compare products.⁸⁰ Consumers must also be able to understand how to interpret the information to make conscious choices and meaningful comparisons regarding the quality and utility of used products.⁸¹ When new labelling and rating mechanisms, or standards, are introduced, public education campaigns may be needed to ensure that consumers understand the information they are given and how it could help them reduce their carbon footprint or operational costs.

Elements such as labelling, the availability of information on public support measures, sufficiently co-ordinated administration of subsidy programmes and advisory hubs, such as one-stop shops covering all steps of the process, can improve the *ability* of individuals, households and businesses to make sustainable choices. In their absence, the process can be problematic for those who are *willing* to change their consumption patterns (a topic that will be discussed in Section 3 of this report), to do so.

2.4 Access to infrastructure

Adequate **infrastructure** is vital to enable sustainable choices. Hard infrastructure, as a main feature of the built urban environment, plays a crucial role in driving consumer choice and shaping preferences, especially in the transport and energy sectors.⁸² If our built environment is constructed in a way that prioritises high carbon lifestyles, such as private car use, these are more appealing to consumers than more sustainable alternatives, such as public transport or cycling.⁸³

In the transport sector, the availability of safe, affordable and easily accessible active transport and public transport infrastructure is a key factor determining their relative appeal. However, such infrastructure remains severely lacking in many EU countries, and remains an area where considerable investment is needed to improve street design, lighting and public and active transport network coverage.⁸⁴ An absence of EV charging infrastructure, renewable energy sources, alternative fuels for road networks that cater for long-distance heavy transport, ports and airports for cargo and passenger transport, and active/public transport infrastructure, means that consumers and service providers are less able to choose these options.^{85,86,87}

A substantial increase in public transport and active transport investment and the infrastructure to support EV take-up⁸⁸ is frequently cited as the key enabling condition for higher

rates of consumers adopting less polluting transport practices.^{89,90,91} Measures by public transport service providers, including expanding bicycle spaces on public transport, could also allow more people to combine active travel with public transport.^{92,93}

Employers can also incentivise sustainable transport choices. Provisions such as access to personal hygiene facilities in the workplace, such as showers and locker rooms, bicycle subsidy schemes and safe and secure bicycle storage options, can make cycling to work more viable and appealing for commuters. In future, telecommuting could also be effective in reducing demand on transport services and the need for large offices.⁹⁴ However, it should be noted that this is only viable where high-speed internet is available and affordable.

Some solutions, especially within the transport sector, have limited effectiveness as cost considerations restrict their availability. High-speed trains, providing a viable alternative to air travel, are cost-competitive only in regions with high population density (compact urban regions) thus reducing the theoretical total impact they can have in decreasing air travel demand.⁹⁵ The conclusions of this study reinforce previous findings that location may influence the substitution of rail for intercity air travel. Therefore, individuals in areas with higher population densities are more likely to choose rail travel for short-haul, intercity routes, whereas in regions with lower population densities, high-speed trains offer a less viable alternative to flying.

Regarding **energy**, renewable options for consumers who cannot adopt on-site generation are dependent on the availability of renewable electricity through the grid. This, in turn, is influenced by various factors, including the ease with which it is possible to secure planning permission for renewable energy projects, and public attitudes towards them, which are influenced by a complex set of factors, as discussed in Section 3.2 of this report).

Lack of public support or opposition can be a particularly significant issue affecting the deployment of renewable energy generation infrastructure. Opposition to industrial-scale renewable electricity generation installations, which often require considerable amounts of land, can be a major barrier to increasing generation capacity in line with 2030 and 2050 emissions targets. Local communities frequently oppose new renewable energy projects because of noise, increased traffic or other considerations, such as aesthetic or biodiversity impacts.^{96,97,98}

Some local communities have taken legal action to stop new wind projects, creating investor uncertainty. In Amsterdam, for example, a group of residents organised a referendum to ensure that new turbines would be erected far enough from housing.⁹⁹

In places where public opposition to renewable energy projects is high, the ability of consumers to choose green energy options is adversely affected by their limited availability. To address this challenge, attempts have been

made in recent years to better understand the root causes of the opposition to wind farms, and to develop strategies to help secure acceptance of and support for these projects.¹⁰⁰ For example, in the Dutch city of Zeewolde, initial opposition to a 320 MW onshore wind farm was overcome when the residents were allowed to invest in the project.¹⁰¹

Public opposition can also apply to transport infrastructure if a direct conflict arises over making changes to road use to create more space for active travel or to public transport. Both of these examples underscore why effective integration of active travel and public transport are key to ensuring high levels of uptake.¹⁰²

The business case study below highlights some of the key challenges that energy companies face in relation to permitting processes and the deployment of renewable energy infrastructure.

Business case study

Improving permitting and administrative procedures to accelerate renewable deployment in the EU context – a case study by Iberdrola

There are currently large delays in renewable and storage projects in Europe largely due to issues to do with planning permissions. Removing the planning permission bottlenecks experienced by both onshore and offshore renewable energy developers and storage developers should be an important action line to tackle current challenges in the European energy markets as part of the transition towards a net zero economy.

In the context of the current European response to the energy crisis, the REPowerEU plan includes a wide range of interesting guidelines and policy recommendations. Some key elements of the proposed framework and other European proposals in this field are summarised below.

The challenge is paramount as the role of renewables in the European energy model will be increasingly important. The administrative process for renewable projects to obtain the permits often takes over two years. Moreover, the high number of projects currently in progress has created a permitting bottleneck that will likely cause further delays in the permitting process. In this regard, deadlines should be one year of processing in the go-to areas as indicated by the EU in RePowerEU.

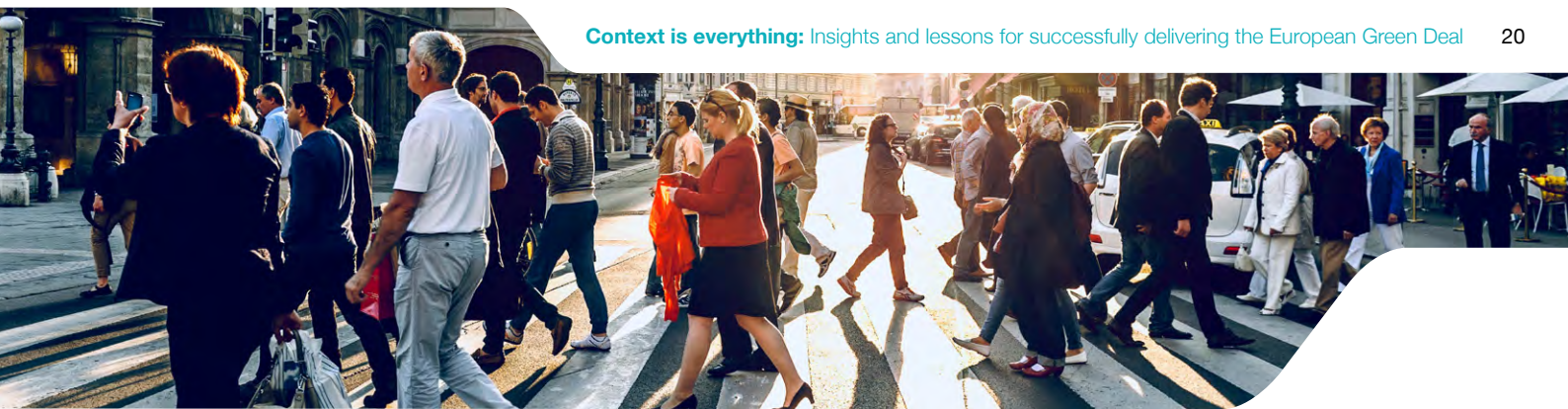
*Renewables 'go-to area' refer to a specific location, whether on land or sea, which has been designated by a Member State as particularly suitable for the installation of plants for the production of energy from renewable sources, other than biomass combustion plants. Source: COMMUNICATION REPowerEU Plan, 18.5.2022 COM(2022) 230 final.

Recommendations

- Proposals should consider investments in renewable energy, related grid infrastructure and storage as projects of high public interest, or the creation of go-to areas*, thereby receiving the most favourable conditions in planning, and permitting procedures.
- Country-specific recommendations for Member States in the context of the 2022 European semester on permitting processes should be in line with Fit for 55 and REPowerEU objectives.
- 'Best practice' guidance for simpler and faster planning and permitting rules in 2022 to support national governments in identifying and addressing specific local challenges; Member States should be publicly benchmarked against these.

Although the proposals constitute a good starting point, at this stage it is essential to integrate them with Member States' regulatory and administrative frameworks.





Section 3

Behavioural patterns and their role in influencing sustainable choices

In the previous section, we discussed some of the key contextual factors that influence people's *ability* to make sustainable choices and their relative appeal. Many of them can be influenced by public sector investment and policies to create better conditions for effective climate policy interventions. However, people do not always make sustainable choices, even if they have access to the necessary information, technology and infrastructure. In addition to the factors discussed in the previous section, people's behavioural patterns are instrumental in driving demand for sustainable goods, materials and services.

Behavioural patterns related to environmental issues are usually stable, persistent and reflected in everyday life. They are influenced by many different factors and strengthened by embedded system practices, social conventions, external influences, peer pressure and awareness.¹⁰³ As a result, these patterns are often very difficult to change.¹⁰⁴

In this section, we outline some of the key factors that influence decision-making, with a focus on sustainable choices in relation to energy use, buildings, transport, and circular practices. Better understanding of how these factors impact on the willingness of individuals and business leaders to change their behaviour and openness to new ideas can help policymakers understand why certain policy instruments, such as those discussed in the previous section, succeed or fail and how their performance could be improved.

3.1 Social norms, conventions and peer-to-peer interactions

Social norms and conventions are frequently cited as being some of the most challenging factors influencing behaviour at personal and institutional levels. People are generally slow to change their behaviour, particularly if a high-emission activity is the social norm.¹⁰⁵ Daily meat consumption habits

or dependency on private car use are good examples. Norms and beliefs also play an important role in food-related emissions, including food waste prevention and management.¹⁰⁶ It has been argued that these can be even stronger drivers of behaviour than positive environmental attitudes.¹⁰⁷

However, social norms can also instigate positive behavioural change. This has been illustrated in relation to incentivising the switch to **low carbon transport** modes¹⁰⁸ and uptake of **energy efficiency retrofit** and **renewable energy technologies**. This 'neighbourhood effect' is well documented by an Australian study which showed an increased willingness of households to invest in solar PV and energy efficiency improvements in neighbourhoods where others have already done so.¹⁰⁹

In the transport sector, peer-to-peer communication often plays a crucial role in determining choice. Opinion leaders can influence the attitudes and actions of others, thereby playing an important role in diffusing innovations in social systems. Opinion seekers, on the other hand, have been found to seek information from their peers and external sources.¹¹⁰

In Norway, many households switched to EVs when they became more popular as people were more likely to know someone who had purchased one. Owning an EV also became associated with specific advantages and symbolic

benefits, for example, allowing people to be perceived by others as ‘doing their bit’ for the environment.¹¹¹ However, many other good practices, such as preventing and minimising food waste, are less visible and therefore less likely to be incentivised by social norms, external influences, the ‘neighbourhood effect’ or peer-to-peer communications.¹¹²

Family factors and circumstances also influence consumer decision-making but their connection to climate policies’ effectiveness is controversial.¹¹³ Even though large families consume more energy, their per capita consumption is often smaller because they typically live in homes that have less space for each household member. Similarly, those living in rental properties can be less incentivised to invest in more sustainable technologies or other lifestyle choices, such as active transport, as their housing circumstances may be temporary.¹¹⁴

3.2 Individual factors

Individual factors, such as attitudes, habits and beliefs, are also important, particularly in relation to choosing modes of transport. To shift behaviour, personal norms need to coincide with the necessary conditions for low carbon transport mode use (ie the availability of low carbon alternatives, such as public transport infrastructure, access to a bicycle and to cycling infrastructure).¹¹⁵ Personal motives and norms, environmental concerns and social needs are key factors for the successful implementation of environmental policies.^{116,117} Sense of responsibility, attitude, self-identity and environmental values are all associated with low carbon consumption behaviour.¹¹⁸ Yet low climate awareness makes it harder to accept newly adopted climate-related regulations that would require behavioural change.¹¹⁹

There are points in time when an individual’s circumstances change radically, for instance, when they move to a new city or change workplace. These ‘**moments of change points**’ create opportunities for behavioural change. The impact of this can be enhanced by increased exposure to new social norms.^{120,121}

Interestingly, **behavioural inertia** can positively influence the green transition. Setting greener choices as a default option has been shown to reduce a consumer’s likelihood of choosing a less sustainable option because they would need to manually change their preference. This approach has worked in Germany, where the switch to renewable-based provisions, as a default electricity option, was found to be more effective in nudging consumers to make more sustainable choices than offering a higher price for less sustainable alternatives. Even less environmentally conscious households did not select fossil-based alternatives if doing so would require an active choice. As a result, it appears that green default options can, in some circumstances, substitute enforced regulations, which are often less palatable to consumers.^{122,123}

3.3 Communication from external sources

Nudges have been shown to effectively encourage consumers to consider more sustainable alternatives. By reconsidering and changing the urban environment, less carbon-intensive forms of transport (less car use) and higher efficiency of buildings can be supported and promoted.¹²⁴

Advertisements are among the most influential and effective contextual factors. Banning the advertisement of energy-intensive, unhealthy or environmentally harmful choices, such as using sport utility vehicles (SUVs) or consuming tobacco products, can help reduce the public appeal of these practices. Restrictions on advertising flights have been proposed for similar reasons, although these attempts have so far proved unsuccessful.¹²⁵

3.4 Awareness

Raising awareness and providing information to citizens about conscious consumption patterns and the impact these can have on climate change and energy bills can increase their willingness to adopt more sustainable behaviours. Improved understanding of climate and environmental challenges and the need for urgent action to address them can also reduce opposition to green policies, including local initiatives.¹²⁶

The REPowerEU plan puts forward several short-term energy saving measures for European households to reduce their annual gas consumption by 5 per cent (13 billion cubic metres) and oil consumption by 16 mtoe.¹²⁷ According to this plan, reducing indoor room temperature, from the current average of 22°C, by 1°C, during colder months, could save 7 per cent of heating energy while still meeting World Health Organization (WHO) guidelines of 19°C.¹²⁸ Although the key objective of the RePowerEU plan is to secure sufficient gas supplies for the coming winter, turning down the thermostat could also help households to mitigate an increase in energy bills.

It has been suggested that sustainable consumption should become part of formal education in schools, and for adults, via more informative energy bills.¹²⁹ Awareness about environmental and climate issues can be improved by teaching, instructing and public information campaigns through three main channels:

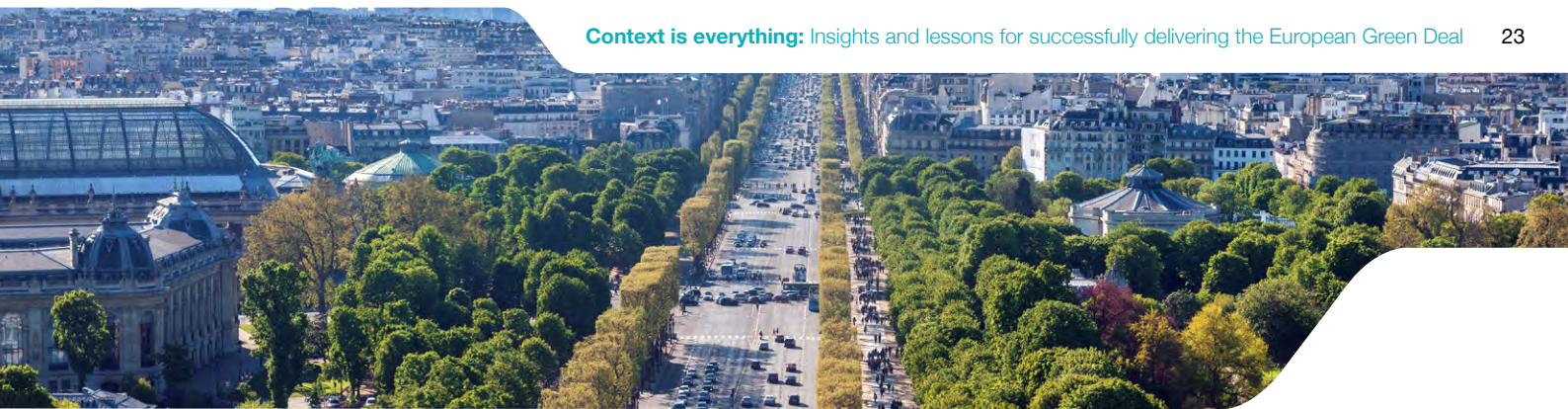
1. Highlighting the co-benefits of certain sustainable choices to increase their appeal.
2. Ensuring that households and businesses are aware of the eligibility criteria of economic incentives and other types of support that may be available to them.
3. Increasing consumer awareness of the environmental and climate impacts their choices can have.

*Millions of tonnes of oil equivalent.

In the transport sector, education can be an effective tool to raise awareness of the health and environmental benefits of active travel, incentivising more people to make this choice.¹³⁰ **In the buildings sector**, particularly in colder countries, educational campaigns on energy efficiency, renewable energy solutions and electric technologies, such as heat pumps, can enable households and businesses to more fully appreciate the benefits of investing in these solutions, including lower energy bills and greater comfort.¹³¹ Awareness campaigns to incentivise people to use less residential and business space (eg flexible use or shared space, shift in housing type)^{132,133,134} may also enable emissions reductions from space heating and embodied emissions in buildings.

However, awareness alone is unlikely to instigate any substantial change in behaviour or to drive up demand for more sustainable products and services. Its role is limited, especially if the sustainable alternatives are considerably more expensive, or require residents and businesses to compromise on cost, comfort or convenience. Awareness-raising campaigns are, therefore, most impactful when accompanied by a comprehensive set of policy measures. These include financial incentives and disincentives, access to information that consumers and businesses need to make sustainable choices, infrastructure that makes these choices viable and regulatory frameworks that help grow the markets (and therefore the range of supply) for sustainable products.^{135,136}





Section 4

Case studies of climate policy interventions: why and how have they worked or failed?

4.1 Scope and approach

In this section, case studies illustrate why some climate policy initiatives have been particularly successful or unsuccessful and the role enabling contextual conditions played.

These case studies enable 'good practice' guidelines to be drawn on the following topics:

- 1 **What kind of action can countries, regions and cities take to enhance/accelerate the impact of climate policies?**
- 2 **How and why does the potential, and appetite, for reducing emissions through greener household/business choices vary across countries and socioeconomic groups? What can be done to increase the appeal of more sustainable choices in different sectors?**
- 3 **How can countries/regions/cities identify situations where contextual conditions hinder green choices and how can these then be amended?**



4.2 Buildings, energy efficiency and renewable energy

Case study 1: Superbonus scheme (Italy)

Description of the policy instrument

Launched in July 2020, Italy's 'superbonus 110%' green renovation programme has formed part of the country's recovery from the COVID-19 pandemic. This ongoing, and recently extended,¹³⁷ scheme offers tax credits of up to 110 per cent on the cost of retrofitting and earthquake-proofing homes. The programme aims to target three key areas of concern: thermal insulation, heating system efficiency and seismic resilience. Building owners can transfer the tax deduction to the company that performs the renovation or recover their investment and an extra 10 per cent in the form of deductions over five years.¹³⁸

Key target groups for the scheme are condominiums, residential properties (as opposed to properties used for a business or profession), housing co-operatives, non-profit, social promotion and voluntary organisations, amateur sports associations and clubs.¹³⁹

Why did it work or not work?

✓ The superbonus public grant policy has largely been regarded as a successful intervention and has provided a strong stimulus that could also boost the take-up of other energy efficiency measures not covered by the grant.¹⁴⁰

By April 2022, more than 122,000 applications had been approved and EUR21 billion spent. The scheme has provided a boost to the construction sector and gross domestic product (GDP), creating at least 410,000 new jobs in the buildings sector and 224,000 jobs in related supplier sectors.¹⁴¹

One of the main success factors has undoubtedly been the fact that the scheme covers the entire cost of the interventions and requires no investment from the participating households. Essentially, people can receive more than the cost of the retrofit through subsidies. However, the scheme does require some upfront financing to cover the building contractors, which can be claimed back.

✗ Despite its many successes, the scheme has been criticised for long delays due to its popularity and for supply chain issues. Since its launch two years ago, there have been multiple changes to the rules and regulations, and issues with the credit transfer system through which people access the government funds to pay for the building work.¹⁴² A rapid increase in demand for energy efficiency retrofit services, driven by the availability of substantial financial support, pushed up their cost and the supply of adequately qualified and accredited contractors was not enough to satisfy demand in the short term. In response to the cost increases, caused by demand exceeding supply, the Italian government has applied price caps on raw materials.¹⁴³

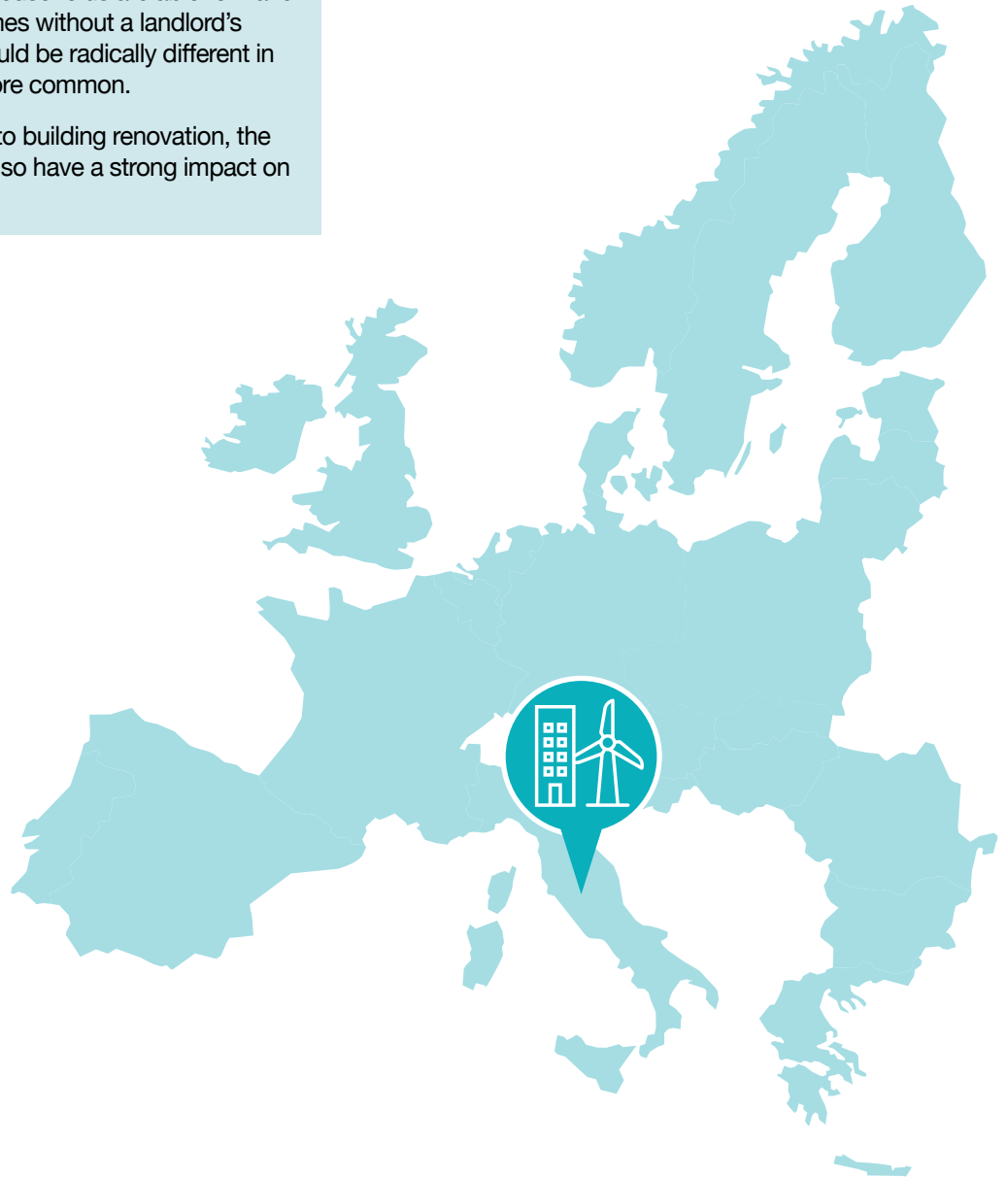
Italy's tax collection agency had also uncovered fraud worth EUR950 million linked to the scheme and other home improvement incentives.¹⁴⁴ Another key criticism has been that the subsidies also allow for the installation of new gas boilers, enabling grant-receiving households to continue to use fossil fuels.¹⁴⁵

The fixed-term nature of the scheme, which will be gradually reduced in size before ending in 2025, has also attracted some criticism as it has affected installation companies' willingness to take on more staff to address the supply-demand imbalance.

Key learnings

A key learning from the Italian example is that renovation take-up rates can be directly and effectively incentivised by financial schemes that provide generous subsidies. However, the success of the superbonus scheme may have been enhanced by the relatively high share of home ownership in Italy (75 per cent, in 2020),¹⁴⁶ which means that a significant number of households are able to make decisions regarding their homes without a landlord's consent. The take-up rate could be radically different in countries where renting is more common.

Furthermore, when it comes to building renovation, the 'neighbourhood effect' can also have a strong impact on individual decision-making.




Case study 2: Green Homes Grant Voucher Scheme (UK)

Description of the policy instrument

The Green Homes Grant Voucher Scheme (GHGVS), launched in 2020, offered homeowners in England vouchers worth up to GBP10,000 to improve the energy efficiency of their homes. The key measures available under the scheme were insulation and low carbon heating solutions, draught proofing, better insulated windows and doors and the installation of heating control equipment. The scheme was intended to enable households to improve the warmth and comfort of their homes and reduce energy bills, carbon emissions and levels of fuel poverty.¹⁴⁷

Under the original design, the total GHGVS budget of GBP2 billion was made available between September 2020 and March 2021, with required funds to be absorbed at a rate of more than GBP300 million per month.¹⁴⁸ The government initially intended to extend the scheme due to much slower take-up than expected but, as a result of certain administrative challenges and lack of interest from the general public, reverted to the original end date and closed the scheme in March 2021.¹⁴⁹

Why did it work or not work?

 Two months before the original end date, around 20,000 households had accessed the funding, well below the intended target of 600,000. Despite efforts by the government to increase take-up, only around 5 per cent of the funds allocated for the scheme were spent.

Like many other home renovation programmes, the GHGVS was developed hastily, to a very tight timescale, and did not allow for adequate planning, design or information distribution. Inadequate, or non-existent, engagement and consultation with industry and consumers before its introduction, combined with a short timeframe, overcomplexity in design and high administrative burden, all contributed to a lack of success. Additionally, the scheme failed to provide compelling incentives for companies to register as suppliers and for households to plan their renovation. Its short-term nature also meant that it was not feasible for new operators to emerge, or for existing ones to scale up their supply of materials and skilled staff. Bureaucratic issues led to delays in issuing vouchers to customers and in paying the service providers.¹⁵⁰

In summary, the scheme suffered from several delivery challenges and performance challenges caused by heavy administrative burden and the failure of the government to adequately publicise the scheme.¹⁵¹

Consumers struggled to understand the application process and encountered considerable difficulties in finding installers,

or obtaining the required number of quotes. Those with limited internet access and computing skills, including older people and other vulnerable groups, found it particularly hard to access information about the scheme and its benefits.¹⁵²

Finally, the scheme was ill-timed, taking place during the winter months when bad weather conditions were likely to slow down projects and households were reluctant to disrupt their heating system during cold days.¹⁵³

The Public Accounts Committee (PAC) conducted a review of the scheme and its report, published in December 2021, highlighted a number of such weaknesses. In particular, the PAC report found that:

- the Department for Business, Energy and Industrial Strategy (BEIS) had an unrealistic implementation timescale for the GHGVS delivery
- the scheme's design was overly complex and did not sufficiently address the needs of consumers and installers.¹⁵⁴

Key learnings

The GHGVS provides a useful resource to any government seeking to implement their own scheme with similar key objectives.

Appropriate communication and co-ordination with industry stakeholders is key to the successful delivery of any kind of programme that requires service providers to register and acquire accreditation. Without sufficient availability of installers to carry out the work, such schemes are doomed to fail.

When designing and implementing a short-term subsidy scheme, it is important to devise and deliver a strategy for public engagement. This should include information about different low carbon heat options and help people choose the best system for their home.¹⁵⁵ Households must be able to access advice from accredited professionals on how to best maximise the benefits of the scheme. Administrative burden should be minimal to ensure equitable access and to enable households to complete the process before its closure, even if they are not among the first applicants.

The timing of subsidy schemes is also important. If people are more likely to renovate their homes during the summer months, running a subsidy programme exclusively during the winter months would have a substantial adverse impact on engagement levels.

Lastly, it could be better to trial a pilot scheme and scale up over time.

Case study 3: Residential building renovation policies in Poland (in the Central and Eastern European context)

Description of the policy instrument

As outlined in the ‘Renovation Wave for Europe’,¹⁵⁶ huge emission cuts in the buildings sector are needed to achieve climate neutrality by 2050. The need for this renovation wave is particularly evident in Central and Eastern Europe (CEE), where energy-inefficient, communist-era apartment blocks remain prevalent and fuel poverty rates high.¹⁵⁷ In 2021, eight CEE countries – Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Poland, Romania and Slovakia – were planning to apply for EU funds for building renovation projects.¹⁵⁸

In CEE and the EU there are a number of hurdles to overcome when scaling up renovations to residential buildings. Some of these apply especially to privately owned, multi-apartment buildings. These challenges largely stem from a lack of community awareness, engagement and the investment needed to finance energy efficiency renovations of multi-apartment buildings.¹⁵⁹

Yet, there are successful examples for national policies in the CEE region. One of these is in Poland where, despite lagging rates of buildings renovation, two positive initiatives are worth highlighting.¹⁶⁰ These include:

- A **thermo-modernisation surplus programme**, which provides cheap loans for the renovation of multi-family buildings and for the installation of renewable-based energy appliances (heat pumps, boiler upgrades, PV water collectors, electric heating and other thermo-modernisation construction materials including insulation and windows).¹⁶¹
- A **‘Clean Air’ programme**¹⁶² and its extension ‘Stop smog’¹⁶³, dedicated to low-income households and single-family homes. This was a nationwide public grant scheme to support building renovations, replacements for polluting heat sources and small-scale PV installations to address Poland’s air pollution problem. A budget of PLN103 billion (c. EUR22 billion) had been earmarked for the programme, to be used by March 2022.¹⁶⁴ Since launching in 2018, the programme has received 384,000 applications for a total of PLN6.45 billion (EUR1.4 billion) of funding (by February 2022), which has led to 307,000 agreements for a combined PLN5 billion (EUR1.1 billion) being approved.¹⁶⁵

Why did it work or not work?

A frequently cited, common reason why the transformation of the European (and specifically, CEE) buildings sector falls well behind the pace needed to meet emissions targets is the structural deficiencies that stem from a lack of regulatory framework for deep renovations (as opposed to partial renovations).¹⁶⁶



Key strengths of the above Polish examples include well-defined target groups (multi vs. single-family) and their ability to reach people in low-income households through proper segmentation of beneficiary groups, while keeping the regulations concerning subsidy awards simple.¹⁶⁷

Further factors contributing to the success of the Clean Air initiative include: shortened processing times, overall simplification of the subsidy application, an electronic application process, inclusion of the banking sector as a source of complementary and bridging finance (loans/credits), linking subsidies to the environmental impact by offering low carbon and renewable energy bonuses and the provision of subsidies for projects that are already underway.¹⁶⁸



However, the deep focus on air pollution related measures missed the opportunity to have more energy-efficient homes. For example, it does not require the beneficiaries to achieve any minimum energy savings or meet any prescribed energy efficiency standards, which, if included in the scheme, could be an important measure to address today’s energy crisis.^{169,170}

Key learnings

In designing building renovation policies for the buildings sector, it is key to develop methods for the proper segmentation of beneficiary groups. This enables the regulations concerning application and the awarding of the subsidies to be kept to a minimum, a central reason why the Polish initiatives appear to work well.

Non-market barriers including lack of information and expertise, the need for upfront investment or pre-financing, or the digital divide, all hinder citizens’ ability to renovate their homes.¹⁷¹ Addressing these barriers would help improve the renovation rates as well as the extent to which energy efficiency retrofits are comprehensive in nature to maximise their energy demand reduction potential.

Case study 4: Incentivising wooden construction / Promoting sustainable use of wood in buildings (France: national-level policy, Hamburg: city-level policies)

Description of the policy instrument

In the buildings sector, wooden construction is often cited as a promising way to reduce both embodied and operational emissions. Compared to carbon-intensive building materials, wood provides better insulation, causes fewer emissions and acts as a carbon sink. While the EU does not have an overarching policy in place to incentivise its use, several EU countries have developed their own, often for the purpose of supporting their domestic forestry economies.¹⁷² A United Nations Economic Commission for Europe (UNECE) and Food and Agriculture Organization (FAO) report¹⁷³ highlights policy examples focusing on the proportion of wood in buildings. For example, France's plan for the use of timber in the buildings sector aims to lift the barriers (technical, normative, regulatory and structural) to the development of bio-sourced materials in the buildings sector (p.76).

As part of the new 'RE2020' environmental regulations, from early 2022 France required whole-life carbon calculations for all new housing projects with an emphasis on the use of wood in construction. France has also mandated that all new public buildings must contain 50 per cent natural materials such as timber, hemp or straw. The measure came into effect in 2022 and applies to all new buildings, including those under construction for the 2024 Paris Olympics.^{174,175}

Besides national-level policies, there are some promising city-level initiatives driven by local governments. In the city of Hamburg, several regulations have been adapted to simplify the use of wood in construction projects. Since 2017, using wood in construction has also been supported financially. For residential buildings, every kilogram of wood used is rewarded with a grant of 30 cents, while non-residential buildings can receive 80 cents per kilogram of wood.¹⁷⁶ The fact that these per-kilogram figures can grow significantly in the case of multi-floor buildings, particularly those with sizeable wooden parts, makes it a strong incentive for builders to replace conventional construction materials with wood.¹⁷⁷

Why did it work or not work?

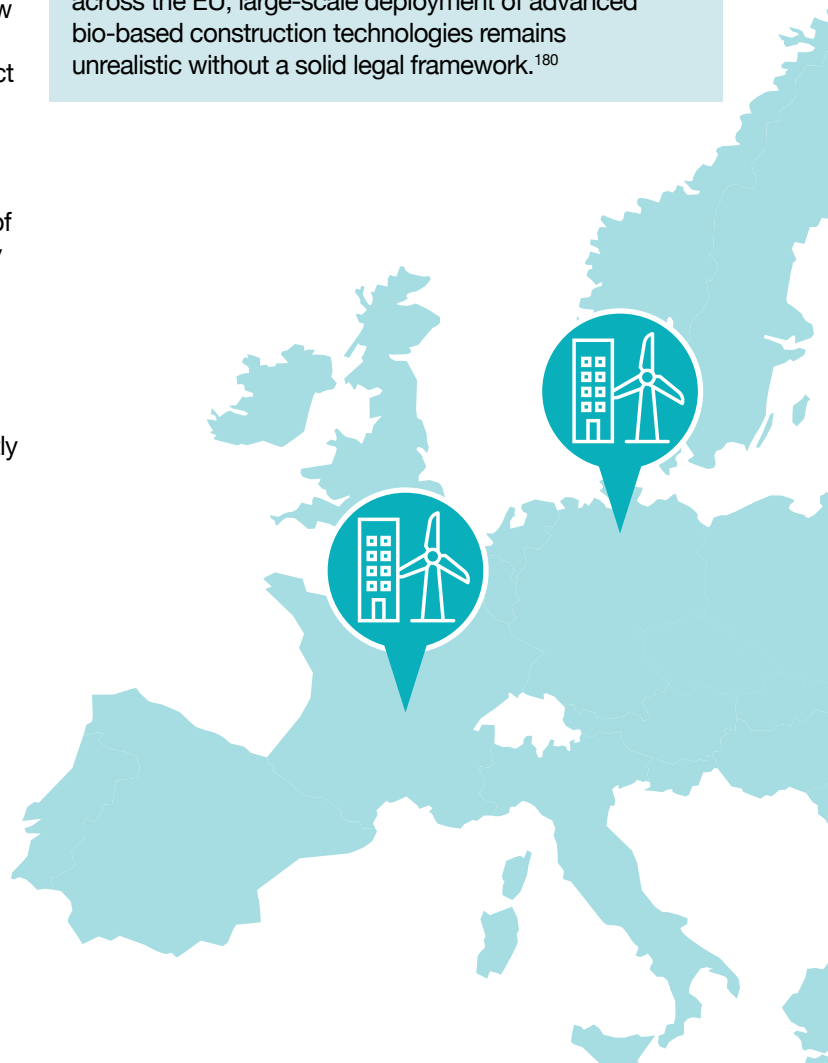


A key beneficial contextual factor for the measures to incentivise the use of timber in construction in France is that it is well embedded within the broader political context¹⁷⁸ and aligns with France's Sustainable Cities plan, launched in 2009, alongside president Macron's drive for the country to be carbon neutral by 2050.

In Hamburg, the regulations align with other plans to promote wood as a sustainable construction material. An ambitious city-level climate plan,¹⁷⁹ and the 'Wood Construction Strategy', currently being developed by the Hamburg Parliament, both focus on identifying the pre-conditions for sustainably sourced wood use in construction.

Key learnings

While there is a promising trend to recognise the potential for climate change mitigation through the use of bio-based construction materials, such as wood, across the EU, large-scale deployment of advanced bio-based construction technologies remains unrealistic without a solid legal framework.¹⁸⁰



Case study 5: Heat pump deployment policies (Denmark)

Description of the policy instrument

The REPowerEU plan aims to double the deployment rate of heat pumps in the EU in the next five years.¹⁸¹ The Danish example outlines how a combination of measures are being implemented in parallel to increase heat pump uptake among homeowners and at a commercial scale. The purpose of this case study is to provide some ideas for how the EU-wide target could be realised across the continent by maximising policy synergies.

How could it work?

The Danish government plans to increase heat pump installation among domestic and industrial consumers. The aim, announced in April 2022, is to convert around 50 per cent of Danish households, currently heated by natural gas, to district heating by 2028 and to substantially increase the use of heat pumps in houses as well as in district heating systems.¹⁸²



To achieve these objectives, the government has implemented a synchronised set of policies to increase the relative attractiveness of heat pumps and to reduce the costs associated with the switch.

Firstly, in 2021, the Danish Energy Agency announced that gas grid operator Evida will not charge homeowners for the costs of disconnecting from the traditional gas network if they wish to replace conventional gas boilers with electric alternatives.

Secondly, subsidies were made available to consumers who switched from individual oil and gas boilers to district heating. Additional funds were made available for heat pump installations to households.¹⁸³

Thirdly, the Danish Energy Agency launched a DKK 44.6 million (around USD7 million) subsidy programme to support the installation of commercial-scale heat pumps, targeting companies specialising in the provision of district heating.¹⁸⁴ This creates a strong synergy between the separate subsidy schemes and incentives: customers are encouraged to switch to heat pumps or district heating, while providers are also supported to adopt the heat pump technology.

Denmark relies heavily on variable renewable electricity sources, which increases the risk of serious grid congestion issues.¹⁸⁵ The high efficiency of heat pumps reduces this risk considerably by lowering electricity demand. Heat pumps can also be used to cool homes during hotter days,¹⁸⁶ which are becoming increasingly frequent. By investing heavily in efforts to increase heat pump adoption, the Danish

government can hope to reduce both the costs associated with blackouts and brownouts, through a drop in voltage, and increased death rates during heatwaves.

Key learnings

While heat pumps powered by renewable energy are highly efficient and can provide an emission-free solution, district heating and the replacement of thermal generators with heating systems powered by heat pumps is yet to gain widespread traction in many countries. Experts have identified significant potential for large heat pumps in many European countries, beyond the frontrunners such as Denmark or Sweden.¹⁸⁷ For instance, in Eastern European countries, where district heating is widely used but still predominantly coal-powered, the right mix of policies could support a shift to more sustainable energy sources and the adoption of a more efficient technology.

In addition to their sustainability credentials, the high efficiency of district heat pumps could contribute to lowering household energy bills, or to mitigate the effects of rapidly increasing energy costs. A recent report analysed the cost to consumers of low carbon heating options, including heat pumps and hybrid heat pumps, in Spain, Italy, the Czech Republic and Poland. It concluded that heat pumps provide the most cost-effective route to decarbonisation of domestic heating.¹⁸⁸

However, in countries where the cost of electricity is substantially higher than gas, energy market reform may be needed to ensure that heat pumps are cheaper to operate than fossil fuel alternatives.¹⁸⁹



Case study 6: Renewable Energy Communities

Description of the policy instrument

The EU is highly committed to increasing the number of energy communities and the share of electricity they produce. From a legal perspective, the European Commission defines these as Citizen Energy Communities (CEC) and Renewable Energy Communities (REC), and there are several similarities between them. Both are legal entities where the emphasis is on voluntary and open participation. Citizens, local authorities and smaller enterprises not active in the energy sector have effective control.

The primary purpose of both types of energy communities is to deliver environmental, economic or social benefits, with financial profit not being among the main goals. The main difference between the CEC and REC is that CECs focus on the energy sector in general, while RECs only use renewable energy sources. Furthermore, RECs need to be autonomous in internal decision-making processes, with larger enterprises not being eligible to participate in them.^{190,191}

Energy communities are strongly citizen-driven and create local job opportunities.¹⁹² Their existence represents a democratisation of energy supply and increased levels of interest in renewable energy sources.¹⁹³ Moreover, these communities often promote energy efficiency measures and flexible demand practices. Optimal use of household devices, such as running household appliances (washing machines, dishwashers and dryers) when the supply is high or the demand is low, can improve grid resilience, reduce energy prices and make it possible to charge EVs from the community grid.¹⁹⁴ Extended energy storage capacities, such as batteries, can further enhance wellbeing and reduce energy dependency on the grid by lowering energy expenses and the inconvenience caused by minimising energy use during peak hours.^{195,196}

The first energy communities were established in the 1960s and 1970s as a result of anti-nuclear and environmental movements. There are currently several energy communities across the EU. By 2019, Germany had the most, followed by Denmark, the Netherlands and the UK. However, their number varies across Member States, with larger numbers being found in the northern than the southern and eastern parts of the continent.¹⁹⁷

Why did it work or not work?

Caramizaru and Uihlein¹⁹⁸ analysed 24 energy communities across the EU and identified some factors which have helped or hindered their development.



One of the key factors driving successful development of energy communities is wealth. Households with higher disposable incomes are more willing to invest in energy-related capital and create these communities. This may, at least partially, explain the uneven geographical distribution of energy communities: countries with overall higher median incomes are located predominantly in the northern part of Europe. These are also regions where heating is essential for long parts of the year and most homes have central heating systems, increasing the financial benefit that can be derived from participation in an energy community. However, in Spain, from around 2012, high energy prices contributed to an increase in the number of these communities.

A supportive policy environment is crucial to the success of energy communities. In 1991, Germany was one of the first countries in the world to introduce feed-in tariffs, which have helped create a stable policy environment for energy communities. However, other tools, such as tax incentives and grants, as found in the UK, can also incentivise their formation.



The removal of financial incentives, on the other hand, tends to reduce the appeal of energy communities, as evidenced in Denmark following changes to the feed-in tariff scheme and in Germany after the implementation of financial restrictions on newly established co-operatives.

Other enabling conditions for energy communities include social capital and interpersonal trust. An abundance of both has enabled these communities to thrive, especially in Germany and the Benelux countries, which have strong traditions of social co-operation and demand for local ownership. However, they have proven much less popular in post-socialist countries.

Reasons that incentivise individuals and households to join an energy community include environmental concerns and consciousness. Moreover, participation in community-owned projects helps foster the acceptance of renewable energy projects, particularly at a local level.

Key learnings

Energy communities can play an important role in increasing the acceptance of renewable energy sources at a local level. They can also generate green electricity and help regulate energy supply and demand imbalances through flexible consumption and storage capacity. Even though their primary focus is on creating environmental and social synergies, they can help reduce energy expenses and create local job opportunities.

Based on examples across the EU, the main enabling conditions for the successful formation of energy communities are wealth, supportive and clear policy frameworks, financial incentives, social capital, environmental concerns and consciousness.





4.3 Transport

Case study 7: EV subsidies (Norway)

Description of the policy instrument

With a population of just over five million, Norway has one of the highest GDP levels per capita in the world as well as one of the most equal societies. It also has the highest level of EV ownership. In March 2022, more than 86 per cent of new car sales were of battery electric vehicles (BEV).¹⁹⁹ The Norwegian parliament has announced that, from 2025, all newly purchased cars should be net zero (electric or hydrogen).²⁰⁰

This success story was enabled by several factors, including a wide range of subsidies. From the early 1990s, Norway has been developing a set of financial incentives, primarily in the form of tax exemptions and other cost-reduction measures. The fact that the Norwegian state applies a relatively high level of taxes, compared to other parts of the world, to an extensive range of goods and services, alongside income, means that tax deductions constitute a powerful economic incentive for businesses and households.

The country's first regulation, in 1990, on the electrification of private cars abolished the import tax on EVs. From the 2000s, EVs became exempt from VAT (25 per cent). For a long time, no road tolls, ferry charges and parking fees had to be paid for them, although recently these regulations have changed to a '50 per cent rule', whereby ferry and road charges for EVs are allowed but must remain below 50 per cent of the charges that apply to petrol vehicles.²⁰¹

New taxes that were introduced based on the nitrogen oxide (NOx) and carbon dioxide (CO₂) emissions of the vehicles do not apply to EVs, further increasing the financial incentive for choosing them. Moreover, these taxes are progressive, meaning that the larger the emissions levels, the more expensive additional emissions units become, making the most polluting cars particularly expensive to run.

In summary, between the 1990s and 2022, the EV adoption rates in Norway increased to such an extent that the capital investment needed to purchase an EV is now similar, or even lower, than the investment needed to purchase a car with an ICE. Moreover, when considering the impact of the various tax incentives and other fee exemptions and rate reductions, the operating costs of EVs were substantially lower even before the recent spike in petrol and diesel prices.²⁰²

Due to the success of the combined measures to incentivise EV take-up, some subsidies and other benefits are now being phased out. From 2023, a moderate VAT rate could potentially be introduced for the most expensive EVs,²⁰³ and municipalities will be able to remove EV drivers' right to access bus lanes or apply it only to EVs that carry more than one passenger. Free ferry and road use has also been largely replaced by a reduced fee, while some other exemptions, such as the road traffic insurance tax, may be removed altogether²⁰⁴ because of their adverse impact on the state tax revenue.

Why did it work or not work?

There are several enabling conditions which helped the measures, intended to incentivise EV uptake in Norway, to succeed. To a great extent, the suite of policy measures worked so well because they encompassed various types of instruments intended to reduce both the capital investment as well as operating costs.



One key factor was that Norway adopted the view that 'polluters must pay' much earlier than most other European countries. Because of high taxes, the government had the resources to provide subsidies and the tax exemptions applied to EVs presented a greater financial incentive to consumers.

The Norwegian government also took early steps to address the non-cost barriers to EV adoption. The EV charging infrastructure in Norway is one of the best in the world. In 2022, around 21,000 charging points were available across the country, compared to only 708 public charging points in Finland, which has a similar land area, or 16,500 in Sweden, which is 60,000 km² larger.²⁰⁵ For long-distance travelling, fast charging systems have been installed along all main roads, and drivers are both able and willing to pay more for these. Between 2017 and 2021, charging rights were defined, meaning that people living in apartment buildings were granted the legal right to charge their EVs at their place of residence, effectively forcing all apartment buildings to make charging points available for residents.²⁰⁶

The 'neighbourhood effect' may have incentivised EV take-up in Norway, along with peer-to-peer communication.²⁰⁷ It is also worth noting that the vast majority of Norwegian power supply already comes from renewable energy sources, making EVs a truly environmentally friendly option for consumers.²⁰⁸ This could be a key factor for some consumers, who find it difficult to accurately estimate the relative carbon emissions from lightweight ICEs against an EV in contexts where a large share of the power supply still comes from fossil fuels.

✕ However, critics claim that reduced taxes have adversely affected tax revenue. This is the reason why some exemptions, such as on VAT for the most expensive vehicles, have been suspended. Moreover, the large subsidies for EVs have resulted in a situation where consumers are incentivised to continue to drive private cars, even in urban areas, instead of switching to public transport. Even the Minister of Transport said that people should not use their EVs in areas that are well connected by public transport, or which have extensive walking and cycling infrastructure for short journeys.^{209,210,211}

Key learnings

The Norwegian subsidies and tax deductions aimed at increasing EV uptake can be regarded as a success. The main contributors have been emissions taxes on traditional cars, charge reductions on ferries and roads for EVs, and other forms of financial and fiscal incentives. Moreover, Norway's EV charging infrastructure is one of the best in the world and the electricity comes almost exclusively from renewable energy sources. Other enabling conditions were the social influence, neighbourhood effect and peer-to-peer communication.




Case study 8: Public transport (Estonia)

Description of the policy instrument


In 2013, Estonia's capital Tallinn, which has just over 400,000 inhabitants, became one of the first cities in the world, and the first capital, to make public transport free, following a successful 2012 referendum.²¹² Subsequently, most Estonian counties (11 out of 15) followed suit, making public transport free in most parts of the country.

The initiative had a dual objective: to tackle climate change and support low-income households. The Estonian economy was badly hit during the 2008 financial crisis, leaving many low-income households unable to afford transport. While Tallinn has been committed to fighting climate change, the use of public transport was falling. The removal of fares was intended to reverse the trend of increasing private car use by incentivising car users to switch to public transport.²¹³

Why did it work or not work?

 The Estonian initiative has not been regarded as a resounding success, with some of the results being slightly contradictory, thus making it difficult to estimate the environmental/climate impact of the policy. The share of commuters on public transport declined by 2 per cent between 2014 and 2019, indicating that the removal of fees slowed the shift away from public transport. However, the policy was not effective in reducing private car use. Although this declined by 5 per cent during the first year of free public transport, the average distance driven by car rose, resulting in a total of 31 per cent additional vehicle kilometres travelled.^{214,215,216}

The small rise in the number of journeys using public transport and average distance travelled primarily came from an increased use of public transport by those who were already using it. This was mainly driven by changes in the use of public transport to go shopping and visit leisure facilities. As such, it may have helped reduce affordability constraints among the lowest income households.

 Despite the policy failing to achieve its original objectives, public acceptance of free public transport in Tallinn was high one year after its introduction.²¹⁷ Yet car traffic continued to increase, while rates of walking fell, possibly due to lower income consumers opting for public transport rather than active transport to improve speed and convenience. This may have improved the opportunities for low-income and unemployed social groups, however there are no studies to corroborate this.

The modest impacts associated with the removal of public transport fees in Tallinn have been attributed to several factors. Firstly, the share of public transport was already high in Tallinn when the policy was first introduced (55 per cent in 2012, up to 63 per cent in 2013). Secondly, prior to the introduction of free public transport, it was already fairly affordable, and the service provision was considered good.²¹⁸ Thirdly, the removal of fees was not accompanied by improved transport services in 'pockets' that were not adequately serviced by public transport. Lastly, buses in low-density areas are slow and the travel times long, meaning that the removal of fees may not have offered a sufficient incentive to instigate a greater shift in these areas.

Key learnings

The main underlying factor explaining the modest success in Estonia is that regular bus lines do not fully meet consumers' needs, so a financial incentive alone is not sufficient to incentivise a large-scale shift away from private car use. In low-density areas, demand could be boosted through the provision of flexible alternative options, such as transport based on demand. The lack of a clear policy environment, different bus route ownership structures and municipal subsidy arrangements, across the country, have also caused an unfair burden on some municipalities' budgets to finance free public transport.^{219,*}

However, free public transport seems to be an attractive opportunity to fight climate change and the Estonian example suggests that acceptance can be high. However, cultural factors and the prestige attached to private car ownership may disincentivise people who can afford to drive from not doing so. Moreover, removal of the costs associated with public transport does not automatically increase its attractiveness in areas that are poorly serviced. Finally, the subsidy system may present high costs to local authorities in areas that are sparsely populated.

A clear and enabling policy environment, the design of routes based on users' needs and the possibility to increase the share of public transport are all necessary to successfully incentivise a large-scale shift from private car use. Better results could also potentially be achieved if the removal of public transport fees was accompanied by financial penalties associated with private car use, however these would likely be met by opposition (as discussed in Section 1.1).

*For example, some local governments, such as Tartu, do not subsidise public transport centres, while other counties do (the top of the range is Northern Estonia at EUR 630,000 in 2019). State support also varies across the country, between 0.83 and 1.31 EUR/line km (ERR News 2021).



4.4 Circular practices

Case study 9: Deposit Return Systems (DRS)

Description of the policy instrument

The EU has several policies in place to reduce waste and increase recycling. Its Circular Economy Action Plan²²⁰ aims to halve residual municipal waste by 2030, imposing on EU Member States a binding recycling target of 60 per cent. However, if municipal waste generation continues to grow, at least 72 per cent of waste would need to be recycled to meet the plan's target.²²¹

Designing and implementing regulatory instruments to increase recycling rates and reduce waste from packaging is challenging because it is derived from multiple materials and uses. Although some broad regulations, such as the Single Use Plastics Directive,²²² provide a combination of high-level and sector-specific requirements (including a 90 per cent collection rate for plastic beverage bottles by 2029 and a minimum of 25 per cent recycled plastic in PET bottles from 2025), its focus on plastics alone does not address the challenges of other packaging materials such as cardboard, aluminium and glass.²²³ Some other policy instruments, including Extended Producer Responsibility schemes, can be applied to a broader range of materials but not all uses.²²⁴ As a result, several different schemes, obligations and instruments will likely be needed at Member State level to meet EU targets for different uses and materials.

One policy instrument that can be especially successful in reducing beverage packaging waste and in increasing recycling rate and reuse, is the Deposit Return System (DRS).²²⁵ Under a DRS, a deposit fee is charged at the point of purchase, which is refunded to the purchaser when the packaging is returned via a specially designed system. DRSs can have extensive environmental benefits by reducing litter in cities and rural areas, achieving high collection rates around 90 per cent (which is higher than collection targets within Extended Producer Responsibility schemes) and

ensuring high-quality food-grade recycled material. The recycling of beverage containers also conserves energy and raw materials, as the materials are reused in new containers or other products.^{226,227}

Different types of DRSs are currently in operation in several European countries, including Norway, Denmark, Finland, Sweden and Germany, to name a few. However, these schemes vary widely in their design, scope and coverage, including which types of beverage containers and materials are accepted, the level of the deposit/refund and the ease of access to facilities where consumers can return them.²²⁸ These factors all influence their effectiveness: schemes that cover fewer materials have a lower overall impact on recycling rates, even if a very high share of the covered products, often around 90 per cent, is collected for recycling.²²⁹

Most DRSs in Europe are mandatory but apply only to certain materials and types of beverage packaging. Norway, however, operates a highly effective voluntary scheme, which relies on tax exemptions to incentivise producer participation – the higher the collection rate, the lower the environment tax, ceasing to be charged when it reaches 95 per cent. Interestingly, this scheme has been extremely successful, achieving return rates of over 90 per cent on single-use plastics bottles and metal cans.²³⁰ Refillable glass and PET plastic bottles were also included in the scheme until their removal in 2015 due to prohibitively high operating costs.²³¹

In 2020, around a quarter of the EU population used some type of DRS. However, due to the increasing legal requirements concerning packaging waste, a growing number of countries are considering its introduction or expansion.²³² To maximise the benefits from the new schemes, it would be ideal if they aligned with each other and with existing ones to increase consistency in scope, in effect moving towards one shared model applied across multiple Member States, safeguarding the single market. At the

moment, each country operates their own scheme, meaning that containers that are purchased in one country may not be accepted in another, or if accepted, the deposit value would not be returned to the customer, reducing the incentive to recycle foreign beverage containers.²³³

To tackle the challenges related to waste, overpackaging and sustainable production, the European Commission's upcoming revision of the Packaging and Packaging Waste Directive is expected to introduce a host of new regulations and amendments to existing legislation.²³⁴ Some representatives from the drinks industry are active in driving progressive regulation in this area. For example, Natural Mineral Waters Europe (NMWE), UNESDA Soft Drinks Europe and Zero Waste Europe (ZWE) have joined forces "to urge the EU to acknowledge the role of DRS and support the establishment of minimum requirements for new DRS in the revision of the EU Packaging and Packaging Waste Directive". Among other things, they support the inclusion of all relevant beverage packaging and the system should be designed to achieve at least 90 per cent return rates for each packaging material. These companies are also vocally expressing their "full commitment to collaborate with policymakers and local stakeholders in the implementation of efficient industry-wide collection schemes across the EU".²³⁵

EU-level regulation on DRS could be particularly effective in streamlining the various national DRS systems and in improving the recyclability of beverage packaging across borders.

Why did it work or not work?

Stakeholder engagement workshops and review of existing literature revealed both positive and negative views on national DRSs across the EU. These allowed us to identify a set of key elements to explain why certain DRSs work so well.



High success rates are largely attributed to institutional factors, such as strong governance, performance reporting, enforcement and high levels of consumer engagement.²³⁶ High taxes on packaging materials and their disposal can also incentivise industry to support the development of cost-efficient DRSs and similar systems, as has been the case in both Finland and Norway.^{237,238}

Consumer engagement, in turn, is driven by factors such as recycling culture, consumer convenience and sufficiently high minimum deposit levels.^{239,240} Cultural considerations and social norms relating to recycling are particularly salient here. In countries such as Finland, where the DRS for refillable bottles dates back to the 1950s, the 'bring back culture' is well established and the use of refund incentives is deeply ingrained in the social conventions and everyday habits of its citizens.²⁴¹

The environmental impact of the DRS depends on consumer engagement which is driven by the scheme's design and scope, with a more comprehensive scope naturally being linked to greater collection rates for certain materials.²⁴²

Technical considerations, such as designing the containers in line with the requirements of the deposit system and the recycling technology, are also important to maximise the efficiency of the system and to attain the highest possible economic value for the materials. The key advantage of the DRS over other collection methods is the high quality and separation of the collected waste,²⁴³ which can be further enhanced by high levels of convenience and transparency.

Overall, the Nordic countries are considered to provide the most successful examples, as they have managed to create the necessary economic incentives for consumers to bring back reusable packaging over time. The lessons from the Nordic countries are frequently cited by others when designing their own DRSs. For example, Slovakia, which implemented their first DRS in January 2022, applied much of the learning from the Nordic countries, focusing particularly on the convenience, transparency and technical considerations to facilitate uptake among consumers and to enable a vast array of products from different manufacturers to be covered by the system. Although the scheme is very recent, it is already regarded as a success, having facilitated the return of 100 million plastic bottles and metal cans in its first six months of operation.²⁴⁴



In some other countries, such as Spain, anecdotal evidence and survey research suggests that attempts to introduce a DRS have not yet been particularly successful, partly because of a lack of enthusiasm and engagement among some key stakeholders, such as retailers, whose participation is essential for its successful delivery.²⁴⁵ Nevertheless, the government will reassess the introduction of a DRS if the current collection targets for plastic bottles are not met by 2023.²⁴⁶

Key learnings

The EU-wide recycling targets cannot be achieved at EU and Member State levels without further measures being implemented to reduce waste and increase recycling rates. The DRS has been successful in most countries, both in increasing the collection rate of the materials in scope and in reducing littering. Most successful cases share certain common features, such as convenience and cultural factors that ensure high levels of public engagement with recycling, alongside strong institutions and broad geographical coverage.

However, it is worth noting that DRSs are typically only applied to beverage packaging and are therefore not effective in increasing recycling rates of the same materials used for other purposes. Moreover, the impact of the DRS varies across countries due to differences in the types of beverage packaging included.

A DRS alone, no matter how effective and comprehensive, will not be able to achieve the necessary reduction in waste and recycling targets simply because so much packaging waste comes from products to which the DRS cannot be feasibly applied. However, alongside comprehensive Extended Producer Responsibility programmes, it is an important part of the set of policies that are needed to deliver the circular targets at EU and national levels, so it is necessary to ensure that the appropriate infrastructure and financial resources are made available to support more extensive and accessible DRSs across the EU. Best practices from countries such as the Nordics, as well as the recent successes in countries like Slovakia, can help others design effective and accessible schemes.

The business case study below illustrates how business action can help incentivise and increase circular practices in plastics beverage packaging.

Business case study

The 'Bottle of the future': driving full circularity in plastics packaging

Coca-Cola Europacific Partners (CCEP) has an objective to recycle the equivalent of 100 per cent of their packaging and to ensure that at least 50 per cent of the material the company uses for their PET bottles in Western Europe comes from recycled plastic (rPET) by 2023. By 2030, the company aims to reach 100 per cent recycled or renewable plastic*, up from 50 per cent today. Recycled plastic has up to a 70 per cent lower carbon footprint than virgin fossil-based PET.

CCEP's 'Bottle of the future' strategy explores how circular PET can be achieved at scale using a combination of mechanically recycled PET and 'like-virgin' quality PET from depolymerisation recycling or PET from renewable sources. To achieve their target, CCEP is working closely with governments and the recycling industry, including entering into long-term supply agreements with mechanical recycling partners (such as their joint venture with Plastipak to create the Infineo recycling centre in France). CCEP is also investing in CuRe Technology to support the commercialisation of the production of 'like-virgin' materials using depolymerisation recycling technology.

Policies like the Single Use Plastics Directive and the Packaging and Packaging Waste Directive have been helpful in driving collective action on circularity but in isolation are insufficient to enable full circularity. The upcoming revision of the Packaging and Packaging Waste Directive could enhance circularity by making Deposit Return Systems (DRS) mandatory in all EU Member States and by improving the food and beverage industry's access to recycled food-grade PET material. The upcoming Directive would ideally also provide clear legislative guidance on chemical recycling technologies because the current lack of guidance in EU legislation is driving uncertainty at a Member State level, potentially restricting the commercialisation of these types of recycling technologies.

*Target relates to CCEP's operations in Western Europe.



100 per cent rPET Coke bottle.

Credit: Coca-Cola Europacific Partners

Case study 10: Regulatory instruments and voluntary action to reduce food waste (France, Denmark, Belgium)

Description of the policy instrument

According to the Food and Agriculture Organization of the United Nations (FAO), about one third of the food globally produced for human consumption is lost or wasted. To address this issue, the UN has introduced a target to cut global food waste at retail and consumer levels by 50 per cent and to considerably reduce food losses along supply chains by 2030.²⁴⁷

In line with this broader global goal, and supported by national or regional regulations, several initiatives have emerged across Europe to raise awareness of ways to minimise food waste and to foster change in consumer behaviour. Some examples include regulations banning supermarkets from throwing away or destroying unsold food, or incentives to redistribute surplus food.

France was the first country to ban supermarkets from throwing away/destroying unsold food, instead obliging them to donate any surplus food to charities or food banks.²⁴⁸ The measure, which has been implemented as part of a wider goal to halve food waste in France by 2025, started from a bottom-up campaign led by citizens and activists, before being passed into law in 2015. This law also introduced an education programme on food waste for schools and businesses.²⁴⁹

Another pioneer in the field is Denmark. In 2016, a Danish charity NGO DanChurchAid (DCA) set up Wefood, the world's first supermarket selling exclusively surplus goods. Wefood sells goods that regular supermarkets can no longer sell due to overdue 'best before' dates, wrong labels or damaged packaging.²⁵⁰ This market-based initiative has been successful in offering city-wide holistic solutions to reduce food waste in Copenhagen. The profits from Wefood are used to tackle famine in countries where DCA works, including South Sudan, Ethiopia and Bangladesh.

Much of Wefood's success can be explained by its unique structure, which is based on a collaborative agreement between Wefood and Føtex, one of Denmark's largest supermarket chains.²⁵¹ Føtex has set very ambitious goals to reduce food waste, with the aim of halving its food waste by 2030. This is supported, and enabled, by the business partnership between the NGO and Wefood. Promotion of such partnerships, and ensuring that the required regulatory framework is in place to support them, could allow these types of partnerships to be scaled up and adopted across many EU countries.

Since 2014 and 2015 respectively in the Brussels and Walloon regions of Belgium, supermarkets have had to offer their unsold food products to redistribution/charitable organisations in order to renew their environmental permits. As stipulated by these local regulations, supermarkets must offer unsold products before the 'best before' date to at least one food redistribution charity before sending them to other forms of disposal.²⁵² This is another model that could be easily applied to other regulatory contexts. Moreover, it can achieve two positive outcomes at once: a reduction in food waste (and therefore emissions) and access to free or very low-cost food to low-income households during the current cost of living crisis.

To help keep track of the global shift towards more resource-conscious food packaging, the Food Packaging Forum has developed the Brand and Retailer Initiatives Database of voluntary initiatives and commitments by food brands (including manufacturers) and retailers (including stores, restaurants, caterers).²⁵³ This is a searchable, online resource which provides information about numerous promising business initiatives.

Why did it work or not work?

The emergence of supermarkets engaged with sustainable strategies for surplus food has been incentivised, supported and reinforced by broader policy developments at various governance levels to reduce food waste and improve circular practices.

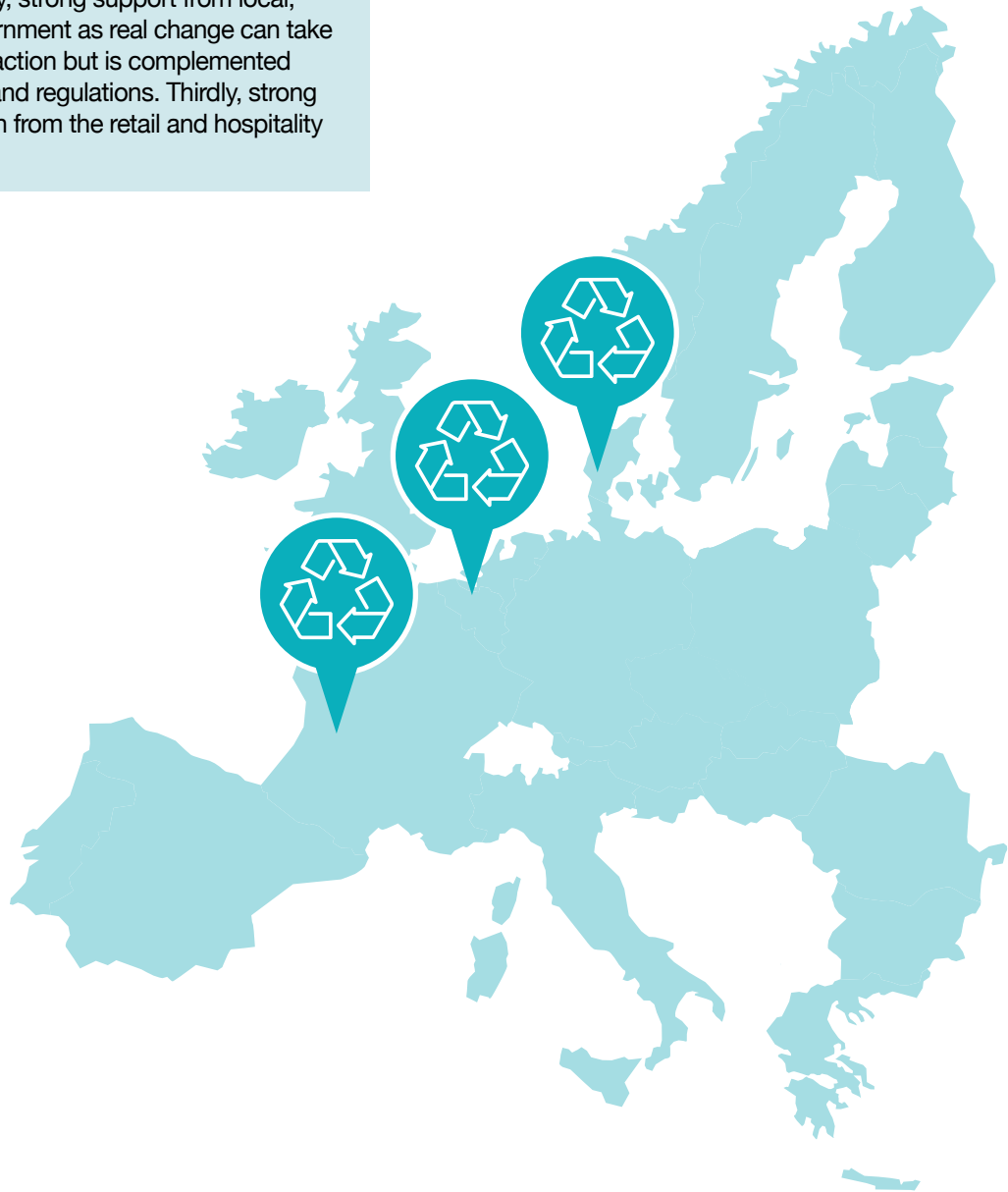
However, there are numerous examples of companies that take voluntary action, entirely without government incentives or support, to reduce waste in their operations. Small-scale supermarkets and food businesses across Europe have introduced, or opted to participate in, various promising solutions to make shopping more sustainable. These include innovative ideas such as Original Unverpackt in Berlin,²⁵⁴ Albert Heijn Packaging Free shopping concept in the Netherlands,²⁵⁵ unPacked in Madrid and YES FUTURE in Barcelona,²⁵⁶ or 'Too Good to Go'²⁵⁷ in many countries across Europe, to name but a few.



A common feature of these pilot-scale, voluntary endeavours is that they are all bottom-up initiatives that did not emerge in response to a certain policy initiative or regulation. Indeed, some of them have been motivated by the lack of policies and regulations. As such, these provide good examples of what companies can do independent of all levels of government, to lead by example and demonstrate that the business sector is ready to implement more sustainable practices. This can also encourage regulations to be applied to enforce these rules more broadly.

Key learnings

Successful initiatives to reduce food waste in the retail sector are often explained by a combination of three supporting factors, as the example of Denmark illustrates. Firstly, the existence of a leader who becomes 'the face' of an initiative. This can be either a company or an individual. Secondly, strong support from local, regional or national government as real change can take place through voluntary action but is complemented by government policies and regulations. Thirdly, strong support and co-operation from the retail and hospitality sectors.²⁵⁸





4.5 Other practices

Case study 11: Voluntary programmes for GHG reduction and offsetting (Catalonia, Spain)

Description of the policy instrument

Catalonia is an autonomous Spanish region with the second largest population and highest GDP in the country.²⁵⁹ It is highly committed to reaching climate neutrality by 2050. Two successful voluntary programmes have been launched to support progress towards this objective at regional levels, with one aiming to reduce GHG emissions (launched in 2010) and another to create an opportunity to offset emissions (launched in 2015).^{260,261}

The aforementioned voluntary programmes are called the 'Program of Voluntary Agreements for the Reduction of GHG Emissions'²⁶² and 'Voluntary Offsetting Programme'.²⁶³ The first is intended to help smaller enterprises take GHG inventories by providing tools, support and recognition. This can help them to estimate their own carbon footprint and identify potential methods to mitigate their emissions. It also gives companies the opportunity to publicly share their achievements and targets for carbon neutrality.

In 2019, 199 companies had joined the initiative, primarily from the private sector, with the most representatives from the consultancy, engineering and food industry sectors.²⁶⁴ Following the success of the voluntary scheme, the Catalan Law on Climate Change now requires large companies with more than 250 employees to create a vulnerability analysis of climate change, take GHG emissions inventories and deliver an emissions reduction action plan.²⁶⁵

The Voluntary Offsetting Programme has been introduced to support the GHG mitigation goals of the reduction plan. There are some activities which cannot be carbon neutral, therefore, the remaining emissions need to be compensated. For this purpose, an external platform has been created where local compensation is paid. As a result, initiatives which absorb carbon emissions have been financed.

A publicly available inventory has been launched for participants to report their annual GHG emissions and propose and implement mitigation measures for the following years. The offsetting programme finance projects, which generate measurable and verifiable GHG reduction, are developed in Catalonia and follow strict regulations. The first round of carbon credits was sold in 2019.²⁶⁶

Why did it work or not work?

It can be concluded that the Catalan voluntary programmes have been a big success, to the surprise of critics. In particular, they have raised climate awareness among small enterprises, many of which are now participating in these programmes.



This success can be attributed to several factors. First of all, stakeholder engagement was important during the planning and implementation of both programmes. The Catalan government responded to companies' requests for an offsetting programme: the Voluntary Offsetting Programme was created following business demand for it.

Keeping the focus local was also a key element. The verification process and carbon credit buying and selling processes are accredited by a third party. Many companies that are not participating in the voluntary programmes apply a similar methodology to calculate their own emissions inventory. Drawing up but not sharing this inventory may be explained by several reasons. Firstly, the Climate Change Law has already introduced several pollution-related taxes and the largest companies must create action plans. Secondly, if it is not compulsory, some companies may not want to report their emissions publicly but want to be prepared for a potential extension of compulsory GHG reduction programmes. Thirdly, these companies and other entities may not be ready for mitigation and, therefore, avoid sharing their inventory – yet having mechanisms in place to calculate them can still be useful.

One of the main factors enhancing the programmes' positive impact is that they were created as bespoke initiatives for Catalonia. Despite using internationally accepted standards, the regional requirements were considered when calculating carbon credits. Before the introduction of the programmes, several meetings were held to incorporate stakeholder views. Capacity building was also a key factor driving success as small businesses often lack sufficient knowledge and tools to calculate their own GHG emissions and set climate goals. Support from the regional government addressed this capacity issue.

The programmes were also well publicised and contextualised. The Catalan government spoke publicly about climate change, raised awareness among small enterprises and guided them, in part by providing information and examples from larger companies. Content was published in three languages (Catalan, Spanish, English) and grants were made available to implement energy efficiency measures.²⁶⁷ The opinions of stakeholder organisations were also promoted to further enhance the engagement of small and medium-sized enterprises (SMEs).²⁶⁸

It is also important to note that some activities cannot be mitigated internally. These include indirect emissions if green options are not available. In such cases, offsetting can be the only way to reduce environmental impact. The regional government countered against the public perception that offsetting allows businesses to pollute, successfully encouraging more to sign up.²⁶⁹

Key learnings

The Catalan government was able to launch two successful voluntary programmes: one aimed to reduce GHG emissions and one to offset the remaining emissions. These programmes were, against all expectations, hugely successful. There are four main contributors to this: (1) Extensive consultations prior to implementation; (2) Keeping local; (3) Clarity and explicit focus; (4) Altering public perception. Moreover, they focused on small businesses which have fewer resources to calculate their emissions and offsets by providing simplified methodology of GHG estimation, potential tools of mitigation and making financial support and capacity building available to them.

The business case study below discusses how local delivery with national funding can support context-appropriate implementation.



Business case study

Connected LED street lighting in Poland: how a targeted national programme enabled action at scale by local governments

In Poland, lighting operator Oświetlenie Uliczne i Drogowe Sp. z o.o. (OUiD Kalisz)* delivers lighting infrastructure services to over 100 municipalities in three provinces. OUiD Kalisz manages over 20,000 connected street lighting units and is one of the largest connected street lighting installers in the country. Local government retains 100 per cent of the company's capital.

Between 2018 and 2021, a number of street lighting upgrade projects were financed by the Polish government's stimulation programme 'SOWA LED outdoor lighting' dedicated to municipalities and organised by the National Fund for Environmental Protection and Water Management. The programme had two key objectives: to reduce CO₂ emissions and to improve energy efficiency through modernisation of the lighting infrastructure.

Lighting industry leader **Signify** was a strategic technology partner for OUiD, providing both hardware and lighting software in the form of Philips street luminaires and the Interact City solution, an intelligent system for remote management of the lighting infrastructure. The investments were carried out by OUiD Kalisz.

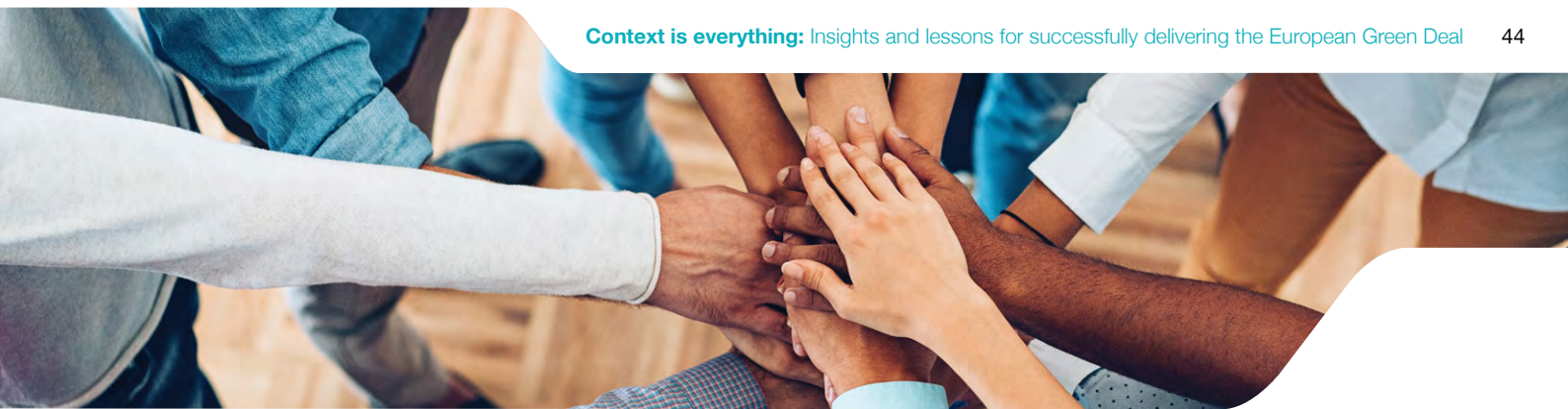
The programme has resulted in various positive outcomes. Despite an increase in the number of light points and lighting levels, cities have reduced their electricity consumption and costs by approximately 70 per cent by switching to LED technology and the Interact City luminaire control system.

*www.oswietlenie.kalisz.pl/

Through having control over the existing lighting installation, local authorities can better adapt the service to changes in the context and needs of the citizens, while also incurring lower maintenance costs. A core enabling factor was the funding from the government's stimulation programme, which enabled participating cities to obtain long-term benefits from investing in more efficient, future-oriented infrastructure.



Estates of single-family houses in Ostrów Wielkopolski City. 'Interact City' improves the visibility and safety of all road users. Credit: Signify.



Section 5

Conclusions and policy recommendations

As EU decision-makers finalise the Fit for 55 Package, some Member States have started working on the revision of their Recovery and Resilience Plans to integrate the REPowerEU objectives for reducing their dependency on imported fossil fuels. Some are also updating their National Energy and Climate Plans to show how they plan to implement new EU climate and energy targets.

This is a crucial moment for the EU as a whole to develop and implement the policies and plans needed to address the multiple issues we face, including climate and cost of living crises, the protection of biodiversity ensuring energy security, improving social inclusion and developing a competitive and growing economy.

This report stresses that **climate policies will not operate in isolation**. Their effectiveness could, and should, be improved through synergies that enable them to generate change greater than that which each policy measure could achieve in isolation. The study highlights how the climate policy outcomes are impacted by the various factors influencing the ability and willingness of individuals, households and businesses to choose more sustainable alternatives to current 'business as usual' practices, behaviours and technologies.

By considering factors that influence both people's ability and willingness to make sustainable choices, the effectiveness of climate policies can be optimised. Addressing only one set of the contextual factors, such as improving infrastructure but doing nothing to change people's awareness and shared perceptions of active transport, may not be enough to create enabling contextual conditions that facilitate policy success.

Policy design and implementation, including the extent to which consumers and businesses are engaged in the process and feel that their opinions and concerns are considered, also play a crucial role in determining the acceptance and effectiveness of climate policy measures. The acceptability of climate policies is particularly important in situations where they have financial impacts or require consumers or businesses to change their behaviour.

Below we go through each of the sectors discussed in the report before summarising a set of general recommendations for how to optimise delivery of climate policies.



Buildings

To reduce emissions from the buildings sector, the European Commission published its *Renovation Wave* communication in October 2020,²⁷⁰ with a goal of 'at least doubling' the building renovation rate, which currently stands at around 1 per cent. To attain this target the Commission has proposed a revision of the Energy Performance of Buildings Directive (EPBD), which seeks to increase the rate and depth of renovation, as well as to introduce important provisions to phase out the worst performing buildings and tackle energy poverty.

To implement this across the EU, policies by national, regional and local authorities for the buildings sector should incentivise more sustainable choices through a combination of financial incentives, such as subsidies for energy efficiency improvements and heat pump installation, and disincentivise emission-heavy alternatives through energy taxation and the removal of fossil fuel subsidies. The effectiveness of these measures can be influenced by several factors related to their design and the contexts within which they are applied.

As illustrated in the Italian, British and Polish case studies in this report, a combination of contextual factors and policy design influences the effectiveness of various interventions. The state of the economy, energy costs and availability of the subsidised goods and services should be taken into consideration when national, regional and local policies addressing the buildings sector are developed. The Danish example of a harmonised policy response to incentivise greater use of heat pumps to reduce overall energy consumption and support a shift to greater use of cleaner heating fuels also exemplifies how strong policy synergies can be applied to facilitate faster decarbonisation of the buildings sector.

This report highlights how subsidy programmes, developed by national, regional or local governments for the buildings sector, have a greater chance of attracting high levels of engagement when:

- they have a low (or no) co-pay requirement, or they provide different degrees of support based on households' and businesses' ability to pay
- information about the scheme is easily accessible and comprehensible, and assistance is available to help interested parties through the application process as well as providing contact details for reputable companies able to carry out retrofits
- the subsidy scheme is supported by an awareness-raising campaign that clearly outlines the benefits of the subsidised technologies
- relevant service providers and equipment producers have been informed about the scheme well in advance, and the programme runs long enough to make it economically viable for these companies to upscale their capacity

- a harmonised set of policies is applied to address a specific challenge and to deliver a desired outcome
- accreditation requirements are explicit, easy to follow, quick to complete, aligned with existing qualification and certification schemes and sufficiently robust to ensure high quality.

In addition to the operational emissions of buildings, there is a growing awareness of the need for the EU and Member States to do more to reduce emissions from building materials and construction, ie the embodied emissions of buildings. Some legislative measures to address this challenge may be introduced in the revised Energy Performance Building Directive (EPBD), due later in 2022 or early 2023.²⁷¹ Our case study of policy measures to incentivise greater use of wood and other bio-based materials in construction in France and the city of Hamburg illustrates actions that individual local governments of Member States have already taken on this issue.





Energy

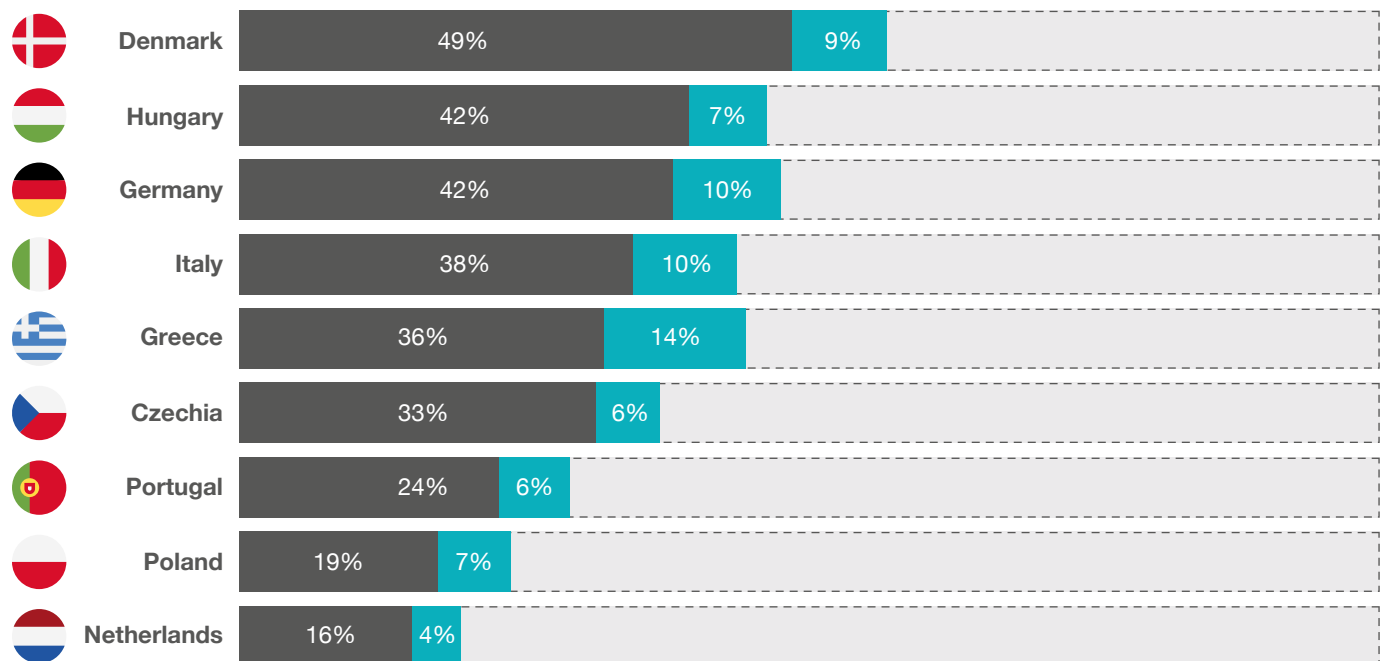
Under the Fit for 55 Package, alongside other key proposals to reduce emissions, the European Commission proposed the revision of the Renewable Energy and Energy Efficiency Directives to accelerate the EU's clean energy transition. The Commission's proposal for the renewable energy target is to reach at least 40 per cent gross final consumption of renewable energy by 2030, and for energy efficiency, a 9 per cent reduction in energy consumption by 2030 compared to 2020.

Following Russia's invasion of Ukraine, the European Commission released its REPowerEU plan to reduce the EU's dependence on its fossil fuels and accelerate the green transition. The REPowerEU plan aims to further increase the EU's renewables and energy efficiency targets to 45 per cent

and 13 per cent respectively by 2030, as well as accelerating the permitting process for renewables and proposing a solar strategy.

In September 2022, at the request of Member States, the European Commission also proposed binding **demand-side energy reduction measures** to address the current energy crisis. For example, converting all residential, professional and streetlighting to LED technology in the EU would save 188TWh, which is the electricity required to operate 47 million heat-pumps, meaning all the households in Germany and The Netherlands. In Germany, converting all professional lighting to LED would save the equivalent of the whole annual production of electricity from Russian gas.²⁷²

Lighting savings to cover the "Fit for 55" gaps



The diagram represents a selection of light points' applications in the EU27 countries. Data presented here is a simulation within the framework of the Europe Green Switch conventional light point conversion model, which is a program run by Signify to help its customers accelerate the switch to energy-efficient lighting products, systems and services. All figures and data presented here are illustrative and based on forecasts and assumptions



Achieved reduction
 Lighting savings
 Fit55 Target reduction

Source: Signify, 2022. Saving targets for each country are set based on the Commission's proposal to cut greenhouse gas emissions by at least 55% below 1990 levels by 2030. CO₂ emissions for each country reference to the European Environment Agency database (latest published data are for 2020).

*i.e. all applications that are not residential: offices (public and private sector), schools, healthcare, industry, warehouses, streetlighting, sports.

An effective response would require certain systemic changes to be implemented in a relatively short time, while also ensuring protection for the most vulnerable households. The following factors would play a key role:

- **Provide appropriate and strong financial incentives and instruments to accelerate investments by investors, companies and households.** Current fossil fuel subsidies amounting to billions of Euros should be phased out.^{273,274} VAT reductions or removal for insulation and other energy efficiency solutions, as well as electric heating and cooling, solar panels and water heating solutions, would help reduce the upfront investment cost. However, it is also important to ensure that electric and low carbon thermal options are cheaper to run than fossil fuel alternatives in the mid to long term, as well as providing targeted social support for low-income households given the cost of living pressures.
- **Fully and effectively mobilise existing EU funds and structures.** The Commission should ensure national, local and regional EU funding, as well as its Recovery and Resilience Facility all work together to coherently support the energy transition.
- **Urgently increase and accelerate the provision of new training schemes built on the needs identified by employees and employers.** The lack of adequately skilled workers is a major barrier to the effective implementation of energy efficiency improvements in buildings, heating and cooling systems and renewable energy projects.

Similarly, policies designed at national level to increase the demand for **renewable energy technologies**, such as support to help domestic consumers and businesses to adopt them, will be crucial. Initiatives such as energy communities can provide opportunities for people to engage, proactively, in the delivery of global and national climate goals, while increasing their ability to pay by pooling resources and economies of scale.

Contextual factors including high levels of awareness of the climate impact of fossil fuel use and high energy costs tend to increase the uptake of different types of support mechanisms among domestic consumers and businesses. However, as illustrated by the case study of energy communities, high levels of mutual trust and favourable regulatory frameworks also impact on the probability of households and businesses to get involved in community-owned or governed renewable energy projects. Although the number of new energy communities has grown slowly over the past few years, the current energy price crisis appears to have revived interest in these types of projects, including in the CEE region where they have traditionally not gained much traction.²⁷⁵

Conversely, low levels of awareness of climate change or the importance of renewable energy in addressing the climate challenge can present a barrier to greater deployment of green technologies, especially at utility scale. One of the

biggest challenges to the expansion of renewables is the need to secure permission to install them in significant numbers, with this usually requiring local community support. Public engagement and education are key to addressing this challenge.

Educational campaigns can be influential in informing people about the climate, environmental and biodiversity impacts of different types of renewable energy infrastructure, while business initiatives such as a utility company having 'renewable sources' as a default option for new customers can increase the customers' likelihood of selecting a renewable supply.

The REPowerEU plan is strongly committed to encouraging behaviour change, including moderating domestic heating and cooling, and switching to public and active transport. Especially in the current energy crisis context, it is clear that climate targets and reduced fossil fuel dependency cannot be achieved without the active participation of citizens. Removal of financial disincentives to 'go all-electric', such as abolishing gas network service discontinuation fees, may also be needed to incentivise households and businesses to embrace the opportunities that renewable on-site generation provides.



Transport

The European Commission proposed to review the existing CO₂ emission standards for cars and vans to align with the EU's new 2030 climate and energy targets. The Commission's proposal sets a new target to reduce 55 per cent of CO₂ emissions for cars and vans by 2030 compared to 2021 and reach 100 per cent reduction by 2035.

Under this timeline, new combustion engines would essentially be banned from 2035. The revised legislation also sets out a more robust framework for the calculation of emissions and the setting of targets, as well as enhanced monitoring and review provisions.

To achieve these targets, national, regional and local policies to strengthen the net zero emission transport infrastructure and to incentivise households and businesses to switch from ICE vehicles to EVs will play a key role. Mechanisms to incentivise EV take-up typically involve subsidies, tax exemptions and other measures, including free parking or the right to use bus lanes. These measures tend to be more successful in wealthier countries where a larger share of households can afford to purchase a more expensive car when only a small part of the cost is subsidised.

However, as illustrated by the case study of EV adoption in Norway, other contextual factors also influence the effectiveness of subsidies and other incentives. Tax deductions are more rewarding in countries where taxes are high, while the right to use bus lanes has greater appeal in areas where congestion can substantially increase journey

times. But it is not only financial affordability that is crucial: willingness to change is also an important driver for switching to EVs. A strong ‘neighbourhood effect’, peer-to-peer communication, advertising campaigns and high levels of awareness about the climate impact of ICEs also affect how EVs are regarded. Finally, extensive charging infrastructure is a necessary precondition to facilitate high rates of take-up as, without it, they are not generally perceived as a viable option. This combination of measures and contextual factors has helped make Norway the leading EV ownership nation, although it is possible that the strong suite of policies was easier to adopt in the absence of a strong domestic ICE car manufacturing industry and with less need to manage industry transition.

Measures to reduce the cost of public transport have had some level of effectiveness in reducing private car use, as shown by the Estonian case study. However, this might only be viable in compact cities with relatively small populations, and does not necessarily result in any noticeable decline in emissions, especially if private car use is also rapidly decarbonising or public transport use is already fairly affordable and widespread (as was the case in Estonia). Moreover, as the Estonian case study shows, free public transport may not radically reduce private car use unless accompanied by improvements to the quality, safety and coverage of the public transport network, or other contextual conditions that increase the cost of private car use.

It is indeed possible that it is the *relative* cost and convenience that has the greatest impact on people’s choice between private car and public transport. In summer 2022, Germany made monthly tickets for all local trains, metros, trams and buses available to all residents for the ultra-low price of EUR9.00. Although the main objective of the three-month trial was to encourage the use of public transport and ease the burden of high energy costs, it has reportedly reduced private car use enough to lower air pollution by 7 per cent while also cutting CO₂ emissions by over 1.8 million tonnes.²⁷⁶

However, heavily discounted or free public transport requires considerable resources and investment from central or local governments, or both. In areas where the cost of removing all fares from public transport is prohibitive, rate reductions could potentially be applied selectively, on certain services and times of the day or for specific population groups. Public sector transport providers could also be supported by levelling the tax field between renewables and fossil fuels to decrease the costs incurred by providers and those faced by end consumers.

Active transport is an area that has been subject to increased interest in recent years, largely because of the health and air quality improvements it can deliver. To incentivise people away from private car use in large numbers, active transport networks need to cover many of a city’s residential neighbourhoods, provide good connections across the city and be safe to use. However, positive perceptions of active transport, such as potential health and environmental benefits, are also crucial to convince people. Therefore,

public campaigns are essential in raising levels of willingness to change. Employers can also play a role in encouraging their employees to take up active transport by providing facilities, such as bike storage and showers, and signing up to incentive schemes that enable staff to purchase discounted bikes.



Circular practices

In terms of circular practices, businesses have been proactive in driving change towards greater regulation. However, large-scale change does not occur through voluntary action alone. It requires government intervention that provides strong incentives, attracts public and industry buy-in, and delivers the necessary infrastructure. Successful strategies for **food waste reduction** (such as in Denmark) are largely explained by a combination of the three enabling factors, illustrating the willingness and ability of the main stakeholders to act: the existence of an ‘*opinion leader*’, strong support from government (*government policies*) and strong support and co-operation from the hospitality sector (*industry leaders*).

The European Commission is designing new regulations to achieve greater circularity across the EU. In 2020, the Commission adopted a new Circular Economy Action Plan, which emphasised the need for circular economy initiatives to consider the entire life cycle of products, from the production of basic materials to end-of-life disposal. The Circular Economy Package published in March 2022 includes a proposal for an Ecodesign for Sustainable Products Regulation (ESPR), which builds upon the Ecodesign Directive that covers energy-related products. The ESPR can be a key framework directive for building greater circularity through further measures in product groups through the use of a digital product passport (DPP) to enhance the traceability of products and their components.²⁷⁷

Some circular economy measures have been very successful in certain countries but less well received in others. Countries that have effectively implemented initiatives such as **DRS** on single-use beverage packaging have often developed a consumer ‘bring-back’ culture over time. While this is not considered to be a necessary precondition for a successful scheme, it could help pave the way. However, the willingness of supermarkets and consumers alike to support these initiatives is also hugely important, as are government support, strong governance, transparency and convenience. Regulation mandating something akin to DRS at the EU level is most likely going to be needed to reduce packaging waste and achieve the emission reduction targets for 2035 and 2050. However, the implementation of new schemes will need to be carefully managed to ensure high levels of public and business buy-in.

Overall recommendations

Based on the analysis and case studies presented in this report, it was found that **the best climate policy outcomes are achieved when:**

- **There is coherent policy alignment.** Policies on climate goals are aligned with each other and with broader contextual policies across different governance levels. Policies and practices at local level should be amended, where necessary, to support the implementation of national and EU-level targets.
- **There is appropriate flexibility around local implementation, while retaining common ambition.** EU-level and national-level targets allow some flexibility for local-level implementation to enable local and municipal governments to tailor certain policy instruments to their specific context. A national framework that supports municipalities through targeted funding can help them scale up innovative solutions to cut emissions in a way that allows them to also address other key challenges important to local residents. These flexibilities should not be seen as an excuse not to achieve the EU and national climate and energy targets but should be designed to help each Member State reach and possibly exceed its targets, while supporting households/businesses through the transition.
- **Multiple measures are designed to work together to support a common goal.** A well-designed mix of financial incentives or disincentives and regulatory measures, such as bans and standards, can simultaneously incentivise a certain choice, to increase its relative appeal and make it more easily available and accessible to large numbers of consumers. Information about the options available to consumers and businesses, such as one-stop shops advising on eligibility criteria and how to apply and access the funds where financial schemes are available, are also crucial to ensure a high level of engagement.
- **There is adequate provision for implementation.** Well-resourced, empowered and co-ordinated institutions are in place to enforce regulation, provide legitimacy to climate policy measures (especially if they increase the cost of living) and foster solidarity.

- **There is effective policy design that is appropriate for specific goals.** In terms of policy design, uptake levels are impacted by how extensive subsidies are, what specific measures or technologies are included, eligibility criteria, the complexity of the application process, the implementation period and how well the policy is publicised.
- **Efforts are made to engage and listen to people and businesses affected by the policy.** Stakeholder consultation and involvement is carried out before implementation to identify any factors that potentially help or hinder its effectiveness and engage all stakeholders, so they are more likely to act.
- **There is a clear, well-communicated vision.** Policymakers at all governance levels communicate their vision and plans to businesses and consumers in a clear, coherent and timely manner. Ideally this communication would give businesses and residents the opportunity to engage with the design and delivery of specific policy measures, especially where these have a direct impact on their communities.

As the debate over EU policies moves from target setting to implementation in this decade, the EU faces a 'once in a lifetime opportunity' to develop policies that encourage businesses and households to make sustainable choices, while increasing the prosperity of Europeans and providing opportunities for economic growth and job creation. Whether and how the current set of EU-wide policies is implemented will make or break the EU's response to multiple crises. This report has reflected on a history of European initiatives that were well intended but sometimes did not work because they missed contextual factors. There are key lessons from this history that can help ensure the policies developed and implemented in the next years transform our economy and society, and bring more prosperity to all Europeans.

Europe does not have time to waste on poor policymaking, or half-hearted measures, but must instead seize this opportunity and move forward with commitment, clarity and coherence.

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Appendix: Research methodology

Research questions

The analysis in this report was informed by three key research questions:

1. Which climate policies seek to directly influence the choices of households (end consumers) and businesses (at all stages of the value chain) in the following sectors: 1) Buildings, 2) Renewable energy, 3) Transport, 4) Circular practices?
2. How can contextual factors enhance the effectiveness of the above-mentioned climate policy instruments? What types of policies create the right environment (enabling conditions) to encourage and facilitate greener choices? How, and to what extent, can certain contextual factors make it difficult or less appealing for consumers and businesses to make greener choices? How can policies that hinder progress on climate be identified and addressed?
3. What can we learn from examples where contextual conditions impacted on the effectiveness of climate policy instruments? This includes situations where contextual conditions were supportive of a specific policy instrument, or were amended to make a policy instrument more effective. It also includes instances where the effectiveness of a climate policy instrument was hindered because of contextual conditions.

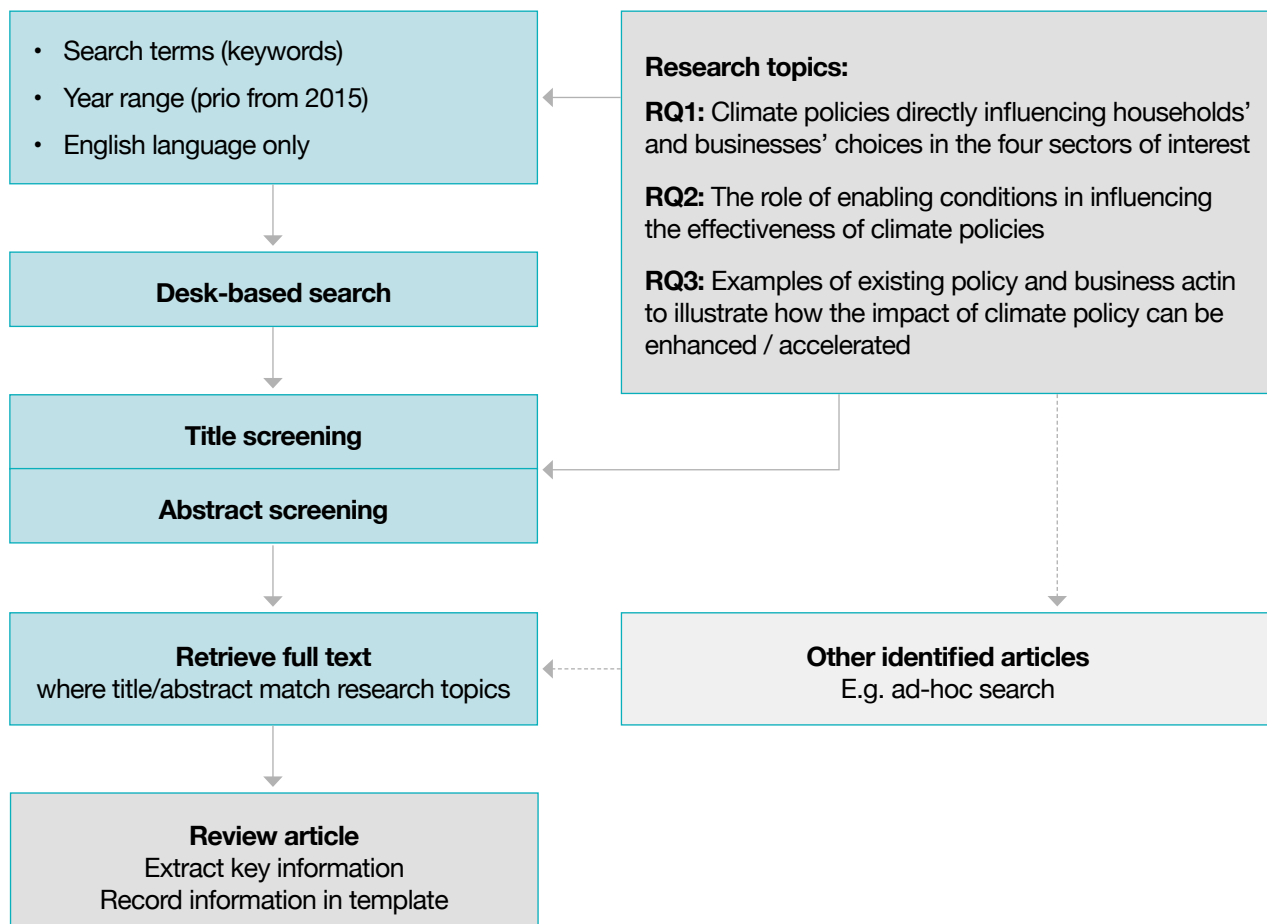
Literature review

To address the first two research questions (see above), a desk-based search was conducted to review available evidence, including both academic and grey literature.

To reduce selection bias in the literature search, we developed a keyword-based search in our review. Figure 1 shows the search methodology employed.

Figure SEQ Figure * ARABIC1 Search methodology for literature review

For each RQ, separate searches:



Initial keywords were obtained from a review of reference articles and a full list of keywords was provided in the inception note.

Separate searches were conducted with the identified keywords:

1. Search for climate policies affecting household and business choices in the four sectors of interest (Research Question 1).
2. Search for how policies can create the right environment/ enabling conditions to encourage greener choices (Research Question 2).

The tables below present the search terms used in the two searches (the first on climate policies directly influencing choices of households and businesses in the four sectors of interest. The second search focuses on the role of enabling conditions/contextual factors in influencing the effectiveness of climate policies.

Search terms – Research Question 1 (RQ1)

RQ1: What are the climate policies and underlying mechanisms that *directly* influence the choices of households (consumer) and businesses (industry) in the following sectors: 1) Buildings, 2) Renewable energy, 3) Transport, 4) Circular practices?

Search stream for RQ1: Households

SCOPUS search: within groups: OR operator; between groups: AND operator; * (star) allows for continuation of search term				
Group 1	Group 2	Group 3	Group 4	Group 5
climat* AND (polic* OR action OR chang* OR warm* OR shift* OR emergency OR transition)	demand-side	direct*	household*	choice
decarbonis*	policy	influen*	consum*	demand
“global warming”	policies	affect*	end-consum*	decision*
emission* AND (reduction* OR sav* OR gap* OR budget* OR footprint*)	measure	effect*	resident*	behaviour* / behavior*
GHG* AND (emission* OR footprint* OR budget* OR neutral*)	regulat*	impact*		alternative*
greenhouse gas* AND (emission* OR footprint* OR budget* OR neutral*)	action	encourag*		attitude*
carbon AND (emission* OR footprint* OR budget* OR neutral*)	strateg*	driv*		lifestyle*
mitigat*	practice	determin*		pattern*
net-zero / “net zero”	approach	shap*		action*
“zero emission” / zero-emission		alter*		change*
low-carbon		form*		norm*
low-emi*		transform*		product*
climate-neutral* / “climate neutral”		modif*		perspective*
carbon-neutral* / “carbon neutral”		unlock*		belie*
environmentally-friendly				convention*
respons*				potential*
environmentally-sensitive				profile*
carbon-intens*				mechanism*

energy-intens*				offset*
durab*				lock-in
energy-effic*				opportunit*
collabor*				devotion
reduc*				mitigation
sustainab*				appetite
green*				technolog* AND lock-in)
				prosumer
				building*
				hous*
				co-housing
				heat*
				renovation
				upgrade
				retrofit*
				insulat*
				electri*
				“energy efficiency” / “energy efficient” / “energy- efficiency” / energy-efficien*
				“living space”
				renewable*
				“clean energy”
				mobilit*
				travel*
				transport*
				“public transport”
				bus
				shar*
				train
				cycl*
				bike*
				(electric OR battery-electric OR EV OR BEV OR fuel- cell) AND vehicle
				“charging infrastructure”
				circular*
				food AND waste
				waste AND manag*
				deploy*
				packag*
				sufficienc*

				“social norm”
				“framing effect”
				“loss aversion”
				“endowment effect”
				“status quo bias”
				“present bias”

Search stream for RQ1: Businesses

SCOPUS search: within groups: OR operator; between groups: AND operator; * (star) allows for continuation of search term				
Group 1	Group 2	Group 3	Group 4	Group 5
climat* AND (polic* OR action OR chang* OR warm* OR shift* OR emergency OR transition)	demand-side	direct*	business*	choice
decarbonis*	policy	influen*	industr*	decision*
“global warming”	policies	affect*	corporat*	behaviour* / behavior*
emission* AND (reduction* OR sav* OR gap* OR budget* OR footprint*)	measure	effect*	compan*	attitude*
GHG* AND (emission* OR footprint* OR budget* OR neutral*)	regulat*	impact*	firm*	action*
greenhouse gas* AND (emission* OR footprint* OR budget* OR neutral*)	action	encourag*	midstream	mechanism*
carbon AND (emission* OR footprint* OR budget* OR neutral*)	strateg*	driv*		demand
mitigat*	practice	determin*		product*
net-zero / “net zero”	approach	shap*		service*
“zero emission” / zero-emission		alter*		opportunit*
low-carbon / “low carbon”		form*		market
low-emi*		transform*		“lead market”
climate-neutral* / “climate neutral”		modif*		value chain
carbon-neutral* / “carbon neutral”		unlock*		supply chain
environmentally-friendly				“intermediate good”
respons*				“intermediate product”
environmentally-sensitive				“interim input”
carbon-intens*				strategy
energy-intens*				model
durab*				innovat*
energy-effic*				develop*

collabor*				“business case”
reduc*				barrier
sustainab*				technolog*
green*				tax
				“shadow price”
				indicator
				law
				requirement
				ban
				equilibri*
				subsid*
				econom*
				adapt*
				“raw material”
				infrastructur*
				appliance*
				electri*
				“on-site installation”
				“on-site deployment”
				renewable*
				“clean energy”
				transport*
				logistic*
				circular*
				packag*
				sufficienc*
				“resource use”
				“basic material”
				“material efficiency”
				“material substitution”
				waste AND (management OR collect* OR recycl* OR reus*)
				recycl* OR reus*

Search terms – Research Question 2 (RQ2)

RQ2: How can climate policy effectiveness be enhanced, or undermined, by contextual factors? How can policies create the *right* contextual factors to encourage greener choices? To what extent can the absence of positive enabling conditions make it difficult for consumers and businesses to make greener choices, and how could these be addressed?

SCOPUS search: within groups: OR operator; between groups: AND operator; * (star) allows for continuation of search term				
Group 1	Group 2	Group 3	Group 4	Group 5
climat* AND (polic* OR action OR chang* OR warm* OR shift* OR emergency OR transition)	demand-side	“enabling condition”	enhance	green*
decarbonis*	policy	“enabling policies”	support	sustainab*
“global warming”	policies	“contextual factor”	encourage	consumer
emission* AND (reduction* OR sav* OR gap* OR budget* OR footprint*)	measure	context	accelerate	choice
GHG* AND (emission* OR footprint* OR budget* OR neutral*)	regulat*	condition	promot*	effect
greenhouse gas* AND (emission* OR footprint* OR budget* OR neutral*)	action	factor	creat*	impact
carbon AND (emission* OR footprint* OR budget* OR neutral*)	strateg*	environment	motivat*	demand
mitigat*	practice		incentiv*	change
net-zero / “net zero”	approach		nudg*	transition
“zero emission” / zero-emission			shift	practice
low-carbon / “low carbon”			driv*	commitment
low-emi*			boost	deployment
climate-neutral* / “climate neutral”			take-up	
carbon-neutral* / “carbon neutral”			synerg*	
environmentally-friendly			absence	
respons*			undermine	
environmentally-sensitive			reduce	
carbon-intens*			cut back	
energy-intens*			downsiz*	
durab*			affect	
energy-effic*			destroy	
collabor*			miss	
reduc*			fall	
sustainab*			lack	
green*			drop	

			obstacle	
			negative	
			out-of-practice	
			insufficient	
			unsuitable	

Stakeholder workshops

To address the third research question on good and bad practice, especially on enabling and hindering contextual conditions, we combined desk-based literature research with stakeholder input.

The virtual stakeholder workshop was held in May 2022. Its objective was to discuss and validate interim findings and support the shortlisting and selection of the case studies in this report.

Participants in the interactive workshop joined three breakout groups examining the key areas covered in the report (renewable energy, buildings and transport, and circular practices). This format gave the participants an opportunity to review an initial list of policies identified for subsequent case study analysis of successful/unsuccessful initiatives, and offered them the opportunity to put forward suggestions for case studies.

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The University of Cambridge Institute for Sustainability Leadership (CISL) brings together business, government and academia to find solutions to critical sustainability challenges.

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