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SOCIALISTS &
DEMOCRATS



Affordable and clean energy for all

PES discussion paper for the Environment,
Climate Change & Energy Network, 30 March 2022

FOREWORDS

Sergei Stanishev
PES President

Europe is going through a challenging period that requires strong and ambitious solutions. The war in Ukraine is leaving profound consequences and has come on top of already difficult circumstances. We are still recovering from the COVID-19 pandemic while high energy prices are posing a heavy burden for our citizens. Now we also need to cut our energy ties with Russia as soon as possible and accelerate the clean energy transition. All this must be done in a way that will allow citizens to remain at the core of energy policies, leaving nobody behind. For socialists and democrats, fighting energy poverty and ensuring that every citizen has access to affordable energy is vital. We need to secure production of more renewable energy but also make clean energy available and affordable for all.

Even before the pandemic and the war in Ukraine, it was clear that the clean energy transition is a priority, but it



has never been more important. The European Green Deal, led by the Commission Executive Vice President Frans Timmermans, is the EU's strategy for becoming climate neutral by 2050. Many initiatives have already been delivered and profound changes will be made by all Member States to implement them. The transition to a decarbonized society is inevitable, and the energy sector plays a crucial role. Our political family is committed to completing the energy transition so that affordable energy becomes a reality for all, Europe becomes more socially fair, more resilient, and we protect our environment.

Achieving a true Energy Union means that all citizens are able to have access to secure, sustainable, competitive and affordable energy. Citizens across Europe are facing numerous challenges in trying to adapt to the new realities. We stand ready to support them now and as we progress further in the green transition.



Javi López

Socialists and democrats have been leading the way in increasing EU's climate ambitions and making sure that Europe is on track towards reaching climate neutrality in a socially just way. Addressing the climate emergency was a priority before the COVID-19 pandemic and the war in Ukraine but it has now become more urgent than ever.

We know that energy poverty has been a challenge for some European countries already in the past and the current energy crisis will cause a further increase in the number of energy poor in the EU, as well as in the depth of poverty. Supporting the most vulnerable households and businesses to weather this crisis is urgent now but we also need to anticipate challenges that might come as we move forward.

We need to further debate on best solutions and measures to be taken. Ordinary citizens will suffer the most, not just from high energy bills, but also from increasing prices

of food. We need to be ready to support the most vulnerable in the short-term, while also accelerating our Green Deal goals in the future. We need more renewable energy produced at home to protect the environment and cut our energy ties with Russia. The publication in front of you contains conclusions of our exchanges and is the result of several fruitful discussions with PES member parties, MEPs, and representatives of trade unions and civil society organizations.

The implementation of the Green Deal and the clean energy transition have become our answer for many challenges: for protecting the most vulnerable, as they are also most exposed to climate change; for protecting the environment and our planet; but also for increasing our resilience and strategic autonomy. With this publication, we want to show how we can work on finding solutions together and set strong foundations for a more socially fair, greener and resilient future.

Yonnec Polet

PES Deputy Secretary General

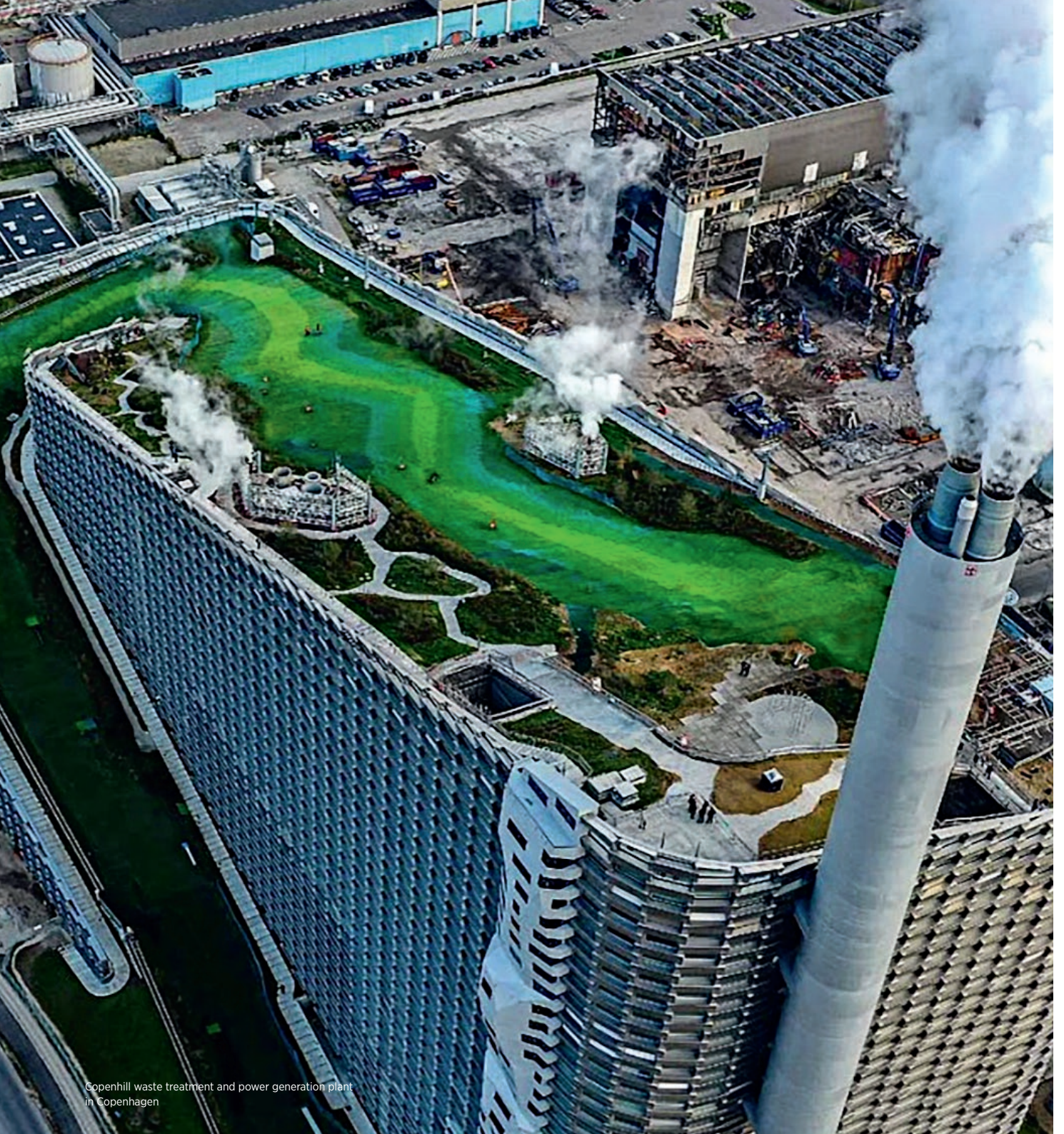
The use of energy is a key component for the functioning of our societies, and we cannot live without it. At the same time, not all citizens have equal access to affordable energy and energy poverty is still prominent in some Member States. The use fossil fuels is leaving negative consequences on the health of our planet and makes us exposed to geopolitical instabilities as we depend on receiving energy imports from other countries. The unprecedented circumstances we are currently faced with have showed us how urgent it is to address the weaknesses of our energy system, ensure that affordable energy is available to every citizen in Europe, and that we accelerate the clean energy transition.

In times of unprecedented circumstances, we need unprecedented solutions. Finding the right solutions is not a straightforward task, which is why we discussed the issues concerning the energy crisis intensively within the



PES Environment, Climate Change and Energy Network, led by MEP Javi López. Thanks to the work of the Chair, our member parties, member organisations, NGOs and trade unions, we developed strong conclusions concerning three dimensions: ensuring everyone has access to energy at a price they can afford; ensuring a quick transition towards clean energy; and achieving strategic energy autonomy for our Union.

Short-term measures to address high energy prices need to go hand-in-hand with long-term efforts to decarbonize our energy system and strengthen Europe's energy security and resilience. This publication is a toolbox of policy proposals to achieve this aim. As PES, we are committed to fighting energy poverty and supporting the clean energy transition that will not forget those who are hardest to reach.



Copenhill waste treatment and power generation plant
in Copenhagen

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1 Introduction

Energy prices have skyrocketed across all European countries, reaching unprecedented levels over the second half of 2021 and well into 2022. The outbreak of the COVID-19 pandemic left many with a reduced income or without a job permanently. After two years, countries are slowly recovering but the energy crisis is an additional burden for the majority of Europeans, especially those in precarious living situations. In addition to the already difficult situation caused by the pandemic and the energy crisis, there is now a war in Europe. Russia invaded Ukraine on 24 February 2022 and the European Union (EU) must find ways to reduce dependence on, and break away from, Russian energy imports.

Even before the pandemic and the war in Ukraine, it was clear that the clean energy transition is a priority, but it has never been more important. We need to complete the energy transition to protect our citizens from high prices and provide future generations with a livable planet. High energy bills, and increasing and deepening energy poverty, are a threat to the wellbeing of our citizens. It has also become clear that Europe can and must produce more clean energy and reduce its reliance on Russia. Russia provided more than 40% of the EU's total gas consumption and accounts for 27% of oil imports and 46% of coal imports.¹

The sooner we accelerate the roll out of green energy technologies, the earlier we can cut our energy ties with Russia. Accelerating the clean energy transition will reduce emissions, reduce dependency on imported fossil fuels, and protect our citizens and businesses against price hikes.

The solution to addressing the energy crisis can be found in implementing fast, short-term, and effective measures to immediately help the most vulnerable. The inability to afford energy is still a reality for many European citizens. It is estimated that more than 50 million households in the EU are experiencing energy poverty.² The severity of energy poverty is likely to increase drastically, making it an unprecedented challenge for all European countries. Strong negative social impacts caused by this crisis require fast and immediate responses from both national governments and the EU. Proposals on how to address the energy crises in the short and medium-term are provided in section 3.

The current crisis has shown how urgent it is to reduce our reliance on fossil fuels and accelerate the green transition. We would not be so reliant on gas imports today, had we had been faster in the decarbonisation of our economy in the past. Proposals addressing challenges for achieving a socially fair decarbonisation of the energy sector are covered in section 4.



The European Green Deal,³ under the leadership of European Commission Executive Vice-President Frans Timmermans, is the EU's strategy for becoming climate neutral by 2050. Many initiatives have already been delivered by the Commission and profound changes will be made by all Member States to implement them. The transition to a decarbonised society is inevitable, and the energy sector plays a crucial role. The production and use of energy account for more than 75% of the EU's greenhouse gas emissions.⁴ Decarbonising the EU's energy system is therefore critical to reaching our 2030 climate objectives and the EU's long-term strategy of becoming climate neutral by 2050. The transition to a decarbonised energy system and economy is already in motion. It will be further accelerated once the Fit for 55 package⁵ is adopted and implemented.

While the benefits of decarbonisation are clear, the EU still has a long way ahead towards reaching its climate goals and increasing the share of renewables in the EU energy mix. Due to the fact that each Member State has a different energy mix, varying environmental and geographical conditions, as well as limited financial resources, there are different challenges that will affect the EU's progress.

The green transition towards decarbonisation will ultimately bring many benefits for EU citizens, as well as Europe's strategic autonomy. The implementation of the Green Deal is built both on green and social

objectives. If we do not address climate change, the weakest parts of our societies will suffer the most. If we put in place strong decarbonisation policies, the most vulnerable might be affected negatively, but only if we do not take into account and address the social costs that might arise. If we are to move towards more sustainability, our policies and actions must frame this transition as an opportunity and not a threat to our citizens. The most vulnerable must be placed at the core of EU climate and energy policies to ensure nobody is left behind.

For our political family, the key point is that this green transition must leave no one behind. We are committed to fighting energy poverty and supporting the clean energy transition that will not forget those who are hardest to reach.⁶ The Green Deal promotes a just transition, one that protects our citizens, particularly those who are most vulnerable, ensuring that the ecological dimension goes hand in hand with the social dimension. Decarbonisation will only be successful if nobody is left behind. This means that energy poverty and the just transition need to be placed at the heart of the energy transition under the Green Deal. Our other publications such as *Leading the way for progressive and sustainable cities*;⁷ *Affordable and quality healthcare for all*;⁸ *The Circular Transition - Towards an economy that puts people first and respects the limits of the planet*;⁹ and *Healthy lives in a clean environment*¹⁰ further present proposals that complement this goal.



2 Energy and electricity in the EU – a short overview

The energy that European citizens have at their disposal is produced in the EU but is also imported from third countries. Every Member State is allowed to choose its own energy mix, which means that there are great differences between European countries. The following section presents an overview of different sources of energy and electricity in the EU, helping explain why the situation differs from country to country.

2.1 SOURCES OF ENERGY IN THE EU

The energy available in the EU comes from energy produced in Europe and from energy imported from third countries. The total EU energy mix was mainly made up of five different sources¹¹:

- 1 **Petroleum products (including crude oil) (36%)**
- 2 **Natural gas (22%)**
- 3 **Renewable energy (15%)**
- 4 **Nuclear energy (13%)**
- 5 **Solid fossil fuels (13%)**

The shares of the different energy sources in the total energy mix vary between the Member States. Petroleum products (including crude oil) account for a significant share of total energy available in Cyprus (90%), Malta (87%) and Luxembourg (65%), while natural gas makes up just over a third in Italy (39%) and the Netherlands (37%). More than half of energy available in Estonia (60%) and Poland (43%) comes from solid fossil fuels, while nuclear energy accounts for 41% in France and 31% in Sweden. Renewable energy makes up 41% in Sweden and 37% in Latvia.¹²

Energy production in the EU

In 2019, the EU produced around 39% of its own energy, while 61% was imported. The energy production within the EU is also spread across a range of different energy sources:

- 1 **Renewable energy (37%)**
- 2 **Nuclear energy (32%)**
- 3 **Solid fuels (19%)**
- 4 **Natural gas (8%)**
- 5 **Crude oil (4%)¹³**

The production of energy is very different from one Member State to another. The significance of nuclear energy is particularly high in France (78% of total national energy production), Belgium (71%) and Slovakia (58%). Renewable energy is the main source of energy produced in a number of Member States, with over 90% (of the energy produced within the country) in Malta, Latvia, Portugal and Cyprus. Solid fuels have the highest importance in Poland (77%), Estonia (62%), Czechia (52 %) and Greece (49%), while natural gas is the main source of energy produced in the Netherlands (72%). Crude oil is the major source of energy produced in Denmark (41%).¹⁴



Energy imported in the EU

For its own consumption, the EU also needs energy which is imported from third countries. In 2019, the main imported energy product was petroleum products (including crude oil, which is the main component), accounting for almost two thirds of energy imports into the EU, followed by gas (27%) and solid fossil fuels (6%).

Russia is the main EU supplier of crude oil, natural gas and solid fossil fuels.¹⁵ In 2019, 27% of the EU's crude oil imports came from Russia alone, 41% of EU's imports of natural gas came from Russia, and almost half of solid fuel (mostly coal) imports originated from Russia (47%).¹⁶

Other countries we rely on for oil imports are Iraq (9%), Nigeria and Saudi Arabia (both 8%) and Kazakhstan and Norway (both 7%). The EU's imports of natural gas also come from Norway (16%), Algeria (8%) and Qatar (5%), while solid fuel (mostly coal) are also imported from the United States (18%) and Australia (14%).¹⁷

Different patterns among EU Member States are present also when it comes to energy imports. More than 80% of energy imports are petroleum products in Cyprus, Malta, Greece and Sweden and more than a third is gas in Hungary, Italy, Austria and Slovakia. Around 20% of energy imports are solid fuels in Poland and Slovakia.¹⁸

The dependency rate shows the extent to which an economy relies upon imports in order to meet its energy needs.¹⁹ In the EU in 2019, the dependency rate was equal to 61%, which means that more than half of the EU's energy needs were met by net imports. The dependency rate on energy imports has increased since 2000, when it amounted to 56%. The EU mainly depends on Russia for imports of crude oil, natural gas and solid fuels, followed by Norway for crude oil and natural gas.²⁰

2.2 SOURCES OF ELECTRICITY IN THE EU

Electricity is one of three major components that make up total energy production. The other two are transport and heating. Around 21% of the final energy we consume is electricity and it comes from different sources. In the EU in 2019, 39% of the electricity consumed came from power stations burning fossil fuels and 35% from renewable energy sources, while 26% came from nuclear power plants. Among the renewable energy sources, the highest share of electricity consumed came from wind turbines (13%), hydropower plants (12%), biofuels (6%) and solar power (4%).

The sources of electricity production vary among the Member States - around 90% of electricity production came from fossil fuels in Cyprus and Malta, while almost three quarters (70%) of electricity production came from nuclear power plants in France, followed by 54% in Slovakia. In Denmark over half of electricity production (55%) came from wind energy, while around 60% of electricity production in Austria came from hydro power plants.²¹

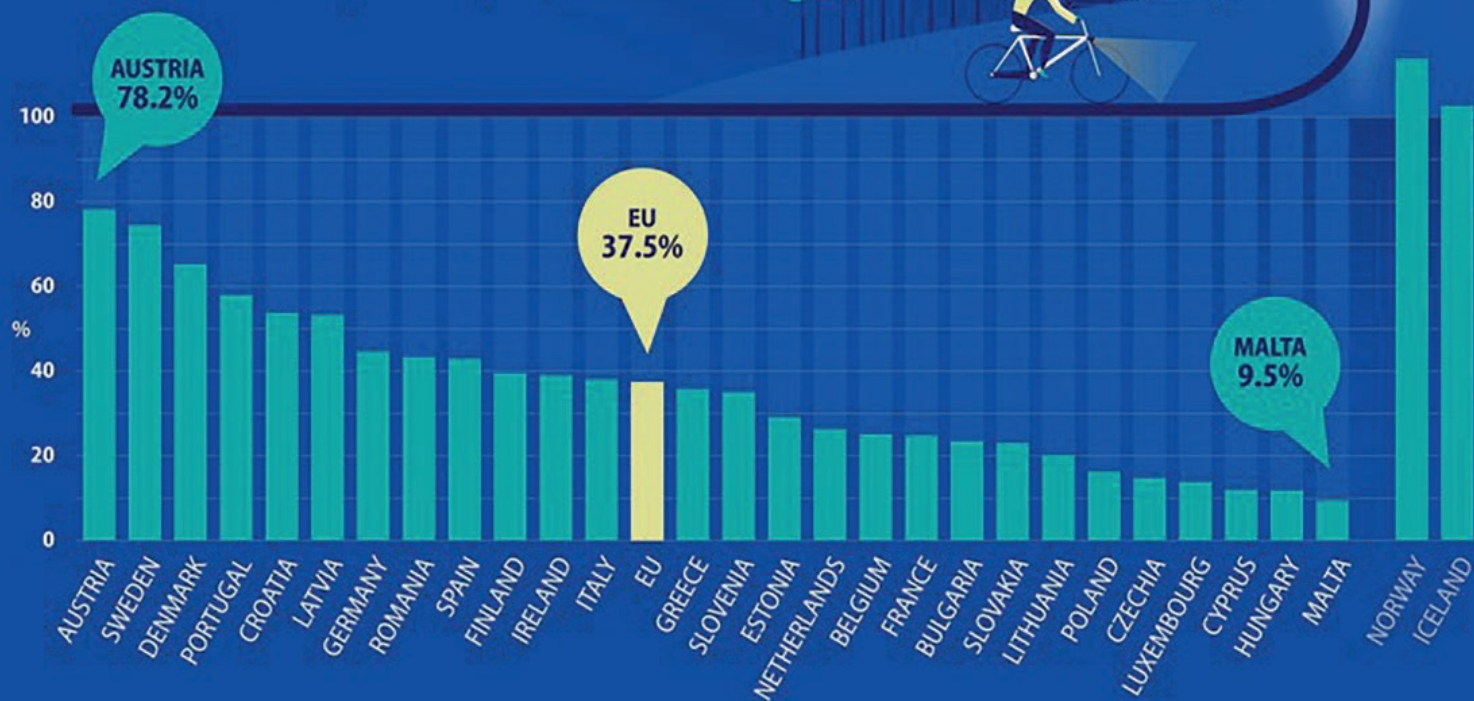
2.3 LONG-TERM TRENDS

Europe has reduced its carbon intensity of energy consumption over the years. In 2020, the EU production of hard coal was 80% less than in 1990.²² When looking at the final energy consumption, oil (crude oil and petroleum products) have a long-term downward trend, while natural gas remains the second largest energy source. The contribution of renewable energy sources shows a continuous growth. Renewable energy overtook solid fossil fuels in 2018 and is further increasing. Despite unfavourable conditions in some regions, the share of renewables in the EU's energy mix still managed to reach 37% in the third quarter of 2021, beating again fossil fuels (35%).²³

Between 2009 and 2019, the trend in primary energy production was generally negative for solid fossil fuels, oil, natural gas, and nuclear energy. The production of natural gas saw the sharpest decline (-49.4 %), followed by oil and petroleum products and solid fossil fuels (with a drop of 34.6 % and 33.2 %, respectively). The production of renewable energies followed a clear positive trend over the same period (except in 2011), with a 48.3 % increase, similarly to waste (non-renewable), which saw a 36% increase.²⁴

Electricity from renewable sources

% of total gross electricity consumption, 2020





3 ANSWERING THE CRISIS OF RISING ENERGY PRICES

Europe has been fighting a surge in energy prices since last year and is facing continued volatility in its wholesale gas markets. Putin's attack on Ukraine is making the energy crisis worse due to uncertainty in the markets and possibility of Russia stopping all imports to Europe. The challenges we are facing must be tackled now to prevent energy poverty from growing and deepening. Member States can take different measures to ease the burden of rising energy bills (section 3.1 & 3.2). In the medium to longterm, the EU can take steps to prevent further increases in prices and reduce its reliance on Russia (section 3.3).

3.1 ADDRESSING SHARP INCREASES IN ENERGY PRICES

The increase in energy prices has not been gradual but sudden and very high. Over the course of 2021, European wholesale gas prices rose by more than 400%,²⁵ squeezing consumers and companies and threatening the region's economic recovery. Prices will remain at high levels throughout 2022 and possibly into the next year. There are a few causes behind the rapid increases in prices.

Limited gas supply in 2021

On the supply side, in 2021 Russia limited pipeline exports to Europe because of high domestic demand, output disruptions and high liquified natural gas (LNG) prices related to Asia's economic recovery. European gas reserves were low and what was used during the winter could not be replenished in the summer months. The need to replenish these reserves meant higher European LNG and gas imports, fostering competition between Europe and Asia for LNG supplies and thus a further increase in gas prices.²⁶ Some EU politicians have accused Russia of deliberately withholding gas supplies in 2021. The International Energy Agency called on Russia to do more to increase gas availability to Europe and ensure storage is filled to adequate levels in preparation for winter.²⁷

Military invasion of Ukraine in 2022

Following the invasion of Ukraine in February 2022, Germany stopped the certification of the Nord Stream 2 pipeline. Although this had no immediate impact on the gas supply as no gas was yet flowing, it brought concerns that Putin might stop deliveries through the Nord Stream 1 pipeline. Similarly, in response to EU sanctions against Putin, there is a growing fear that deliveries to the EU might eventually be shut down, which has an impact on market volatility and causes uncertainty in the markets.

Increased demand

Gas demand increased in the first quarter of 2021 in residential heating, industry and power generation due to a cold winter and widespread remote working. During the summer many countries experienced strong heatwaves which increased the need for air conditioning.²⁸

Unfavourable weather conditions

Another significant factor is weather conditions. Despite the increasing share of renewables that generate power for a low cost, their role has been diminished. Due to hot weather and low wind speeds, renewable



energy production has been low, further pushing the demand for gas. In 2020, 38% of electricity in the EU was generated by renewables,²⁹ but they currently cannot generate enough power to cover 100% of demand all year round.

Carbon pricing

The last and the smallest contributor to the increase in energy prices is the EU Emissions Trading System (ETS). EU carbon prices reached record values pushing a switch from coal to gas, thus keeping European gas demand high. However, only one-fifth of the higher power costs could be attributed to the rising ETS price. The European carbon price has increased but much less than the prices of natural gas. According to the Commission Communication, the effect of the gas price increase on the electricity price is nine times bigger than the effect of the carbon price increase.³⁰

Energy prices are determined by a range of supply and demand conditions, including the geopolitical situation, the national energy mix, import diversification, network costs, environmental protection costs, severe weather conditions, or levels of excise and taxation. Depending on national laws and regulations, the

electricity bill can consist of the price of the energy itself, the transmission and distribution costs, and taxes and surcharges.³¹

The record run in energy prices is not expected to end any time soon. Member States should take immediate steps to alleviate the burden on consumers and businesses, while working on long-term solutions. Those who are most vulnerable should be quickly identified and targeted support should be provided while making sure that incentives for the green transition will not be impacted in the long-term.

In October 2021, the European Commission presented its toolbox for addressing the energy crisis,³² which contains proposals for measures that governments can utilise. Due to great differences between the Member States, responses and measures to be used can vary. In March 2022, the Commission followed up with another Communication – REPowerEU - Joint European Action for more affordable, secure and sustainable energy³³ that is focused on accelerating the green energy transition and reducing our reliance for energy on Russia, as soon as possible.

POLICY PROPOSALS

- The green transition guided by the Green Deal is the only solution to address the current crisis and prevent a similar situation from occurring in the future. The quicker the EU moves towards an efficient and renewable energy-based system, the more effective we can be in protecting our citizens from high energy bills.
- Member States should take emergency measures such as temporary relief from taxes or charges to ease the burden on consumers and businesses, targeting the most vulnerable.
- An urgent European-wide ban on disconnections, similar to measures taken during COVID-19 in some countries, should be imposed to ensure everyone across Europe has access to energy if they default on their bills.
- Measures implemented by the Member States should not negatively impact the investment environment for low-carbon energy sources and technologies.
- Member States should use their energy taxation power in a more targeted, policy-oriented way, both for social and climate purposes.
- Increased energy prices are negatively affecting industry and SMEs, particularly energy-intensive industries.³⁴ This has a knock-on effect on food prices and jobs in these sectors. Financial aid should be provided to companies and industries in compliance with the state aid framework.
- The Commission should closely monitor the situation in the energy market to anticipate any changes that might put some countries in a more precarious situation during the winter.
- Member States should consider using all measures available under the Commission toolbox for addressing the energy crisis³⁵ and the Commission Communication REPowerEU - Joint European Action for more affordable, secure and sustainable energy.

3.2 SUPPORTING THE MOST VULNERABLE TO OVERCOME HIGH ENERGY BILLS

In an EU-wide survey in 2019, 6.9% of the EU population said that they could not afford to heat their home sufficiently. This share is particularly high in some countries including Bulgaria (30.1%), Lithuania (26.7%), Cyprus (21.0%), Portugal (18.9%), Greece (17.9%) and Italy (11.1%).³⁶ Energy poverty was already an issue for many Europeans in 2019. The combined effects of the consequences of the pandemic and the rise in energy prices are likely to drastically increase the number of energy poor households.

The employment rate in 2020 has dropped in most Member States.³⁷ According to the European Foundation for the Improvement of Living and Working Conditions, in July 2020, 34% of survey respondents in Europe reported that their financial situation was worse than before the pandemic and 44% indicated that their household cannot make ends meet.³⁸ With decreasing income and rising utility bills, more and more Europeans were devoting an increasingly large part of their budget to fixed costs. Measures undertaken by governments to curb the COVID-19 outbreak have had a massive impact on the European economy. Despite the short-time work schemes put in place in EU countries, many have lost their jobs permanently.

Precarious workers, whose numbers have been increasing since 2008, were at particular risk.³⁹ During the winter of 2020-2021, millions of Europeans were forced to stay at home because of lockdowns. For many this meant staying in poorly heated houses. While the economy is slowly showing signs of recovery, many citizens have not yet managed to benefit from it. According to the ETUC,⁴⁰ on the first day of autumn in 2021, 15% of Europe's working poor were not able to turn on the heating – equivalent to 2,713,578 people across Europe. That situation has gotten worse in ten EU Member States over the last decade and now soaring electricity prices across Europe risk plunging even more workers into energy poverty.

High gas and electricity prices reverberate through supply chains and contribute to high inflation. Drastic increases in energy spending will shrink the disposable income of the poorest households with their high propensity to consume. The detrimental impacts of energy poverty on wellbeing and health have been well researched and documented.⁴¹ Poor physical and emotional wellbeing, increased vulnerability of people with chronic diseases, greater reliance on health services and medications and social isolation, are some of



the direct consequences of energy poverty. Due to the increased effects of climate change, more attention is being paid to broader energy services, beyond just heating. Warmer weather, more frequent heatwaves and altered wind and humidity patterns are making it more challenging for people to keep their houses cool during the summer months.

The inability to afford energy is directly related to the more general experience of poverty, which means that wider economic and social policies for tackling poverty are crucial. The strengthening of our economy with the goal of increasing the wellbeing of all, and investment in mechanisms of social support, must continue to be complemented by energy policies that adequately support those who have difficulties heating, cooling, and lighting their homes.

Access to energy services is crucial for the social inclusion and participation of every citizen in today's society. Adequate warmth, cooling, lighting and the energy to power appliances are essential services

needed to guarantee a decent standard of living and citizens' health. Addressing energy poverty has the potential to bring many benefits, including less money spent by governments on health, reduced air pollution, better comfort and wellbeing, improved household budgets, and increased economic activity.

It is crucial that Member States take measures that will help the most vulnerable now, but also take measures that will be most suitable and adequate to achieve the aim. Governments can introduce price caps and temporary tax breaks for vulnerable energy consumers, or vouchers and subsidies for consumers and businesses. Evidence shows that reduced VAT rates can in some instance have a regressive impact. Providing targeted financial support, compared to reduced VAT rates, can be more effective in addressing equity concerns and pursuing policy objectives other than raising tax revenues.⁴² When choosing the right combination of measures that aim to ease the burden of high energy bills, measures that help the most vulnerable should be prioritised.



Many Europeans have been facing pressure from rental housing affordability that has widened social and economic divergence. Average house prices in the EU's private sector have increased by over 30% in the past decade, and rents have gone up by almost 15%, surpassing the increase in incomes in many countries.⁴³ Rental affordability will become a growing issue due to rising energy prices and inflation. Support measures for the most vulnerable should also include setting up support mechanism for securing rent stabilisation and affordability. As we move forward in the transition, it is vital that the goals of renovating the building stock, which will help drive down energy use and costs, and ensuring rent affordability are balanced. Member States should consider different instruments that can be used to provide affordable housing for all, such as: rent transparency, rent regulation, rent caps, unlimited rental contracts, protection from eviction for renters and mortgage-holders and binding conditions for receiving public subsidies.⁴⁴

The low rate of renovation of the European housing stock contributes to the price citizens pay for electricity and heating/cooling. Poor insulation or renovation of housing leads to higher than necessary consumption of this type of energy. Associated with this excessive energy consumption are greenhouse gas (GHG) emissions proportional to energy consumption. Therefore, an increase in the renovation rate of the European building stock would play a double role in favour of the decarbonisation drive that the EU wants to achieve by 2050 - reduction of energy consumption in buildings (public and private) and reduction of GHG emissions.

It is therefore essential to identify and locate this sector of the population in an exhaustive manner, so that assistance - such as that potentially provided by the future Social Climate Fund - can be rapid, effective and well targeted. In order to achieve this objective, it is necessary to create a definition of people/neighbourhoods at risk of social exclusion that allows for a more

accurate detection of less developed micro-areas (rural and urban) encompassed within more developed areas, which may appear as a consequence of the application of the different climate measures.

The energy crisis has repercussions for citizens but also for other market participants. Suppliers are faced with a series of problems that could put the smallest of them in economic difficulty, which can further have a negative impact on ordinary citizens. Increases in energy prices is accompanied by a rise in the bills for final customers so energy suppliers could potentially expect an increase in the risk of non-payment. Such an increase could have repercussions in terms of the number of unpaid invoices but also in terms of financial consequences for suppliers. Indeed, because the amount of the bills is increasing, any unpaid bill generates a higher cost for the supplier.

Moreover, in this context of rising market prices, suppliers who wish to hedge their fixed price sales will have to deposit significant collateral. Suppliers who have not hedged all of their fixed price sales currently have to buy energy on the markets at much higher prices. For instance, in some cases, domestic customers have the option of terminating their energy contracts with one month's notice. With rising prices, customers with fixed price contracts, signed before the price increase, will probably continue until the end of their contract. Suppliers will therefore have to buy consumption for customers they thought they were losing at much higher market prices. These higher priced energy purchases will generate losses for suppliers. Suppliers who offer variable price contracts could face financial difficulties if the decision is taken to freeze energy tariffs while prices continue to rise

on the markets. Some governments are considering putting in place price caps, which put a strain on suppliers as they supply on a loss.⁴⁵ In cases where suppliers can no longer provide their services, consumers must be protected and governments must take into account the impacts on ordinary citizens that might occur with the introduction of measures to mitigate the energy crisis.

While citizens are affected by rising electricity prices, some companies and electricity market participants benefit and see their profits increase. Production companies mainly based outside the EU are the biggest beneficiaries of the surge in gas prices. According to an analysis by the NGO Global Witness,⁴⁶ European gas transmission operators and their parent companies made significant profits. Saudi Arabia's Aramco made \$30 billion between July and September 2021. During the same period, Total, Equinor, and Eni together made over \$7 billion while Exxon and Chevron each made over \$6 billion in profits. When looking at the profits of several global companies together, companies' profits in the third quarter of 2021 were 24% higher than during the same period in 2019, before the COVID-19 pandemic temporarily lowered gas prices. Powerful gas companies are enjoying huge profits while ordinary citizens pay the price.

Energy is a basic human right, no one should have to choose between eating, lighting or warming one's home. Principle 20 of the European Pillar of Social Rights states that everyone has the right to essential services, including energy. An end to energy poverty is vital for social justice, wellbeing and fighting the climate crisis.

POLICY PROPOSALS

- Member States should take immediate measures that can reduce energy costs, such as direct income support, and temporary tax breaks or vouchers and subsidies for consumers and businesses.⁴⁷ Households most affected by increased prices of energy should be quickly identified and direct income support should be directed towards those in energy poverty and those at risk of falling into it.
- Member States should ensure that disconnections from the energy grid are avoided.
- Introduction of price caps should take into consideration the impact of such measures on suppliers and consumers.⁴⁸
- Companies that have made extraordinary profits due to the energy price spikes should be taxed more and the revenues should be used to reduce energy bills for the most vulnerable. As proposed by the Commission,⁴⁹ Member States can tax windfall profits and use the money to support their citizens.
- Energy poverty is related to general income poverty. Other benefits and financial support provided through social protection systems should be strengthened whenever possible.
- Between September 2020 and August 2021, EU ETS allowances generated EUR 26,3 billion.⁵⁰ The EU ETS Directive already allows governments to use the EU ETS revenues to support energy bills in the form of real income support for those who need it most.⁵¹ For instance, Spain is using an extra €900 million in auction revenues to compensate households.⁵² National governments could use these ETS revenues to finance direct income support measures that can quickly support consumers.⁵³
- Member States should also use taxation to support vulnerable populations. They should use the flexibility allowed under the Energy Taxation Directive to exempt or to apply a reduced rate on electricity, natural gas, coal or solid fuels used by households.
- Member States should take measures to facilitate rent stabilisation and to ensure that overall housing costs for tenants stay affordable.
- All measures used to tackle the energy crisis should be compatible with the net zero objective while at the same time tackling energy poverty.



3.3 PREVENTING FURTHER INCREASES IN ENERGY PRICES WHILE REDUCING RELIANCE ON RUSSIA

Despite early estimates that the energy crisis would end by spring 2022, it is clear that high prices are set to stay with us for a longer period of time. The evolution of conflict in Ukraine is uncertain, as is the ability for the EU to rely on energy imports from Russia.

Europe needs to strengthen its existing mechanisms, as well as develop new ones to prevent energy prices from further increasing. In order to ensure a faster and smooth transition to a clean energy system, we need a clear regulatory environment for investing in all technologies necessary, improving flexible power generation and developing energy storage solutions.

In cases when European countries depend on external imports, pooling resources and negotiating as a bloc can increase the EU's bargaining power and strategic autonomy. Gas security is increasingly linked to energy security, which has been made clear with the

escalation of the conflict between Russia and Ukraine. Relying on imports means relying on Russia. The EU should take strong and fast steps to implement actions that can reduce our reliance already this year. In response to Putin's actions, the Commission presented a Communication⁵⁴ which seeks to provide guidance on how Europe can reduce its reliance on Russia by two thirds by the end of 2022. Member States should take advantage of the measures proposed, such as mandating obligations for the Member States to ensure their storage levels are high enough, diversifying our supply and accelerating roll out of renewables.

Solar, wind, and other renewables are located within Europe's borders and are not subject to the same global market forces and geopolitical standoffs that are inherent to gas. Gas producers can behave strategically to maximise their profits and exert political influence. This is not only important to contain current energy prices, but also to protect us against producers

using energy prices as a political bargaining tool in other matters and to increase our strategic autonomy. Gas is not reliable now, nor can it be relied upon in the future if we are to tackle the climate emergency. The EU must act proactively to diversify its own sources, suppliers and delivery routes. Assisting countries in the wider neighbourhood in their own energy transition could help stabilise the international environment and facilitate greater energy security for the future.

Gas storage in the EU is currently lower than it was at the same time in previous years. To prepare for next winter, the EU and its Member States must ensure there is sufficient gas storage. On 23 March the Commission presented a proposal⁵⁵ introducing a minimum 80% gas storage level obligation for next winter to ensure security of energy supply, rising to 90% for the following years. Measures to increase storage and coordinate refilling should be taken without delay. Since not all Member States have underground storage facilities, interconnectors will be essential to ensure the uninterrupted energy flow within the whole EU. Where new infrastructure has to be built, it also must be hydrogen compatible.

Roll out of renewables can be accelerated already this year. The Commission estimates that by accelerating the roll out of rooftop solar PV systems by up to 15TWh this year, the EU could save an additional 2,5 bcm of gas. EU institutions are currently in the process of discussing legislative files under the Fit for 55 package. Full implementation of the Fit for 55 proposals, as presented by the Commission, would lower our gas consumption by 30%, equivalent to 100 bcm, by 2030.⁵⁶ Member States and the European Parliament should move to swiftly conclude the negotiations and adopt legislative proposals, without lowering the ambitions but only boosting the proposals with higher or earlier targets for renewable energy and energy efficiency.

In Versailles on 10-11 March 2022, EU leaders agreed to phase out the EU dependency on Russian gas, oil and coal imports as soon as possible and invited the Commission to analyse options for further measures to be taken. The Commission put forward a Communication - Security of supply and affordable energy prices: Options for immediate measures and preparing for next winter⁵⁷ - which presents benefits and drawbacks of exceptional short-term options to temper price spikes. As the energy market is currently not delivering affordable energy, some countries strongly advocated for limiting gas prices on a European level or decoupling electricity prices from the prices of gas.⁵⁸ Following the meeting of the European Council on 25 March, the Commission is tasked to further explore the impacts such measures could have and is expected to assess and present by May further measures to be considered to tackle high energy prices. In doing so, the Commission should ensure that national circumstances are taken into account and that the incentives for driving the green transition forward are not negatively impacted.

The consequences of the current crisis are mostly negative but lessons learnt can be used to create a more resilient EU energy system. The EU should take steps to strengthen its position in the global energy market, build interconnections, increase preparedness for potential future price shocks, increase storage capacities, increase security of supply and reduce dependence on fossil fuels and imports from Russia.



POLICY PROPOSALS

- Member States should swiftly adopt a legislative proposal introducing an obligation for existing storage infrastructures in EU territory to be filled up to at least 80% of their capacity by 1 November 2022, and to 90% in subsequent years.⁵⁹ The EU should facilitate the creation of more gas storage to ensure that no Member State is subject to shortages. Storage is not available in all Member States⁶⁰ and the Commission should ensure easier access to storage capacity across borders.
- Member States should consider the possibility of setting up a joint procurement scheme for gas and coordinate refilling operations, as proposed by the Commission in December 2021.⁶¹ This would allow the EU to pool forces and create strategic reserves.
- The Commission should continue consulting and contracting with other international partners to increase flows of gas and LNG to Europe to enable filling up of storage for the coming winter. Alongside diversification of gas supplies, the EU should also accelerate the production of biomethane and hydrogen.⁶²
- Member States should act collectively to secure gas imports in the best possible conditions and avoid bidding against each other for the same supplies.⁶³
- Member States should use EU state aid rules that allow them to provide short-term relief to companies and farmers affected by high energy prices.⁶⁴
- In assessing the compatibility of emergency temporary measures in the electricity market taken by the Member States, the Commission should take into account national specificities, such as for instance, the national energy mix composition and level of interconnectivity, in line with the EUCO Conclusions of 25 March.⁶⁵
- The EU should prepare for more volatility, i.e. more periods of very high and very low prices. The Commission should take action to support and scale up development of electricity storage that will help in smoothing peak demand.
- The Commission should assess the current wholesale electricity market⁶⁶ and its capacities to address price volatility of gas and other aspects that might affect the effective transition towards a net zero energy system.
- The Commission should assess the possibility of developing fully aligned regional or EU-wide retail markets that would operate on similar rules and help keep prices under control.⁶⁷
- Coordination mechanisms between Member States concerning the maintenance operation should be strengthened to avoid shortages due to maintenance works.⁶⁸
- The EU should engage in energy diplomacy and consider the role of Africa and the wider neighbourhood in ensuring higher renewable energies shares on the EU markets.

POLICY PROPOSALS

- **Member States should ensure that the planning, construction and operation of plants for the production of energy from renewable sources, their connection to the grid and the related grid itself are considered as being in the overriding public interest and in the interest of public safety and qualify for the most favourable procedure available in their planning and permitting procedures. The Commission should swiftly present a recommendation on fast permitting for renewable energy projects.⁶⁹**
- **Member States should map, assess and ensure suitable land and sea areas that are available for renewable energy projects.⁷⁰**
- **Explore a joint EU portfolio of ‘option contracts’ to be activated by Member States’ competent authorities when energy security is threatened.⁷¹**
- **The Council and the European Parliament should increase targets under the Fit for 55 package legislative files that can help the EU accelerate the transition. For instance, as proposed by the Commission, doubling the objective of Fit for 55 for biomethane would lead to the production of 35 billion cubic metres (bcm) per year by 2030.⁷²**



4 THE ROAD TO A JUST CLEAN ENERGY TRANSITION

Energy transition refers to the global energy sector's shift from fossil-based energy production and consumption — including oil, natural gas and coal — to renewable energy sources like wind and solar. To help meet the 2050 goal, the Commission has set a more ambitious interim target for the EU to raise the share of renewable energy to 40% of final consumption by 2030, up from roughly 20% in 2019.⁷³ Having a decarbonised energy system will enable us to keep our planet healthy but will also prevent future increases in energy prices. The aim of building an Energy Union is to give EU consumers, households and businesses, secure, sustainable, competitive and affordable energy. The missing links to achieve a true Energy Union must be addressed so that everyone can benefit. We will be able to make this transition a reality only if we bring everyone along. The first question is how we can ensure that the transition is socially fair and supports the most vulnerable parts of our society. The second question relates to the steps we need to take to make and use available energy sources efficiently, and to roll out renewable energy production as fast as possible. The former is addressed in section 4.2.1, while the latter question is addressed in section 4.2.2. The question of what could be needed temporarily in the transitional period, is dealt with in section 4.2.3. Implementing all of these steps is also what is needed to abolish ties with Russia and ensure greater strategic autonomy and resilience.



4.1 CITIZENS AT THE CORE OF CLIMATE AND ENERGY POLICIES

4.1.1 A TRANSITION THAT SUPPORTS THE MOST VULNERABLE

Addressing climate change is a matter of urgency and many countries worldwide are already undergoing structural changes towards a low carbon future. The share of energy produced from renewables in Europe is increasing, carbon prices are rising and the EU is setting ambitious greenhouse gas emissions targets for many sectors, especially those that contribute to GHG emissions the most. On 14 July 2021, the European Commission published Fit for 55 package,⁷⁴ a set of proposals that will drive the EU towards achieving its 2030 GHG emissions reduction target. Many of the proposals included will impact the energy sector and energy prices.⁷⁵ As indicated in the accompanying Impact Assessment, a consequence of the green transition might be that “households in the lower-income

deciles might have to compensate higher energy expenditures by reducing consumption of other goods. As energy costs are projected to increase, energy poverty could intensify if not adequately addressed.”

Women in particular are more affected by carbon pricing than men, as they account for 85% of single parents, whose families are at a higher risk of child poverty. Considering gender as a significant determinant of poverty is important in the design of social measures. If not, the consequence is that many of these social policies do not take into account women and other vulnerable groups. It is also important to create decent, affordable and resource-efficient housing.

AFFORDABLE AND CLEAN ENERGY FOR ALL

NARRATIVES AND FIGURES

As PES, our priority is to ensure that affordable and clean energy becomes a reality for all citizens across Europe. Having access to affordable energy for all goes hand in hand with the efforts to decarbonise the EU's energy system, ensure a green transition that benefits all citizens equally, and increase Europe's strategic autonomy. The energy crisis and the war in Ukraine have pushed Europe to rethink how we can accelerate the clean energy transition. This paper presents proposals for solutions to make energy affordable for all, accelerate the green transition and strengthen our Energy Union.

Supporting the most vulnerable to overcome the energy crisis

The consequences of the COVID-19 pandemic coupled with the rise in energy prices and war in Ukraine are likely to drastically increase the number of energy poor households. Households most affected by high energy prices should be quickly identified and direct income support should be directed towards those in energy poverty and those at risk of falling into poverty.

Results of an EU-wide survey for 2020 showed that around 33 million European citizens could not afford to heat their home sufficiently.¹ The number of energy poor is expected to increase due to the energy crisis.

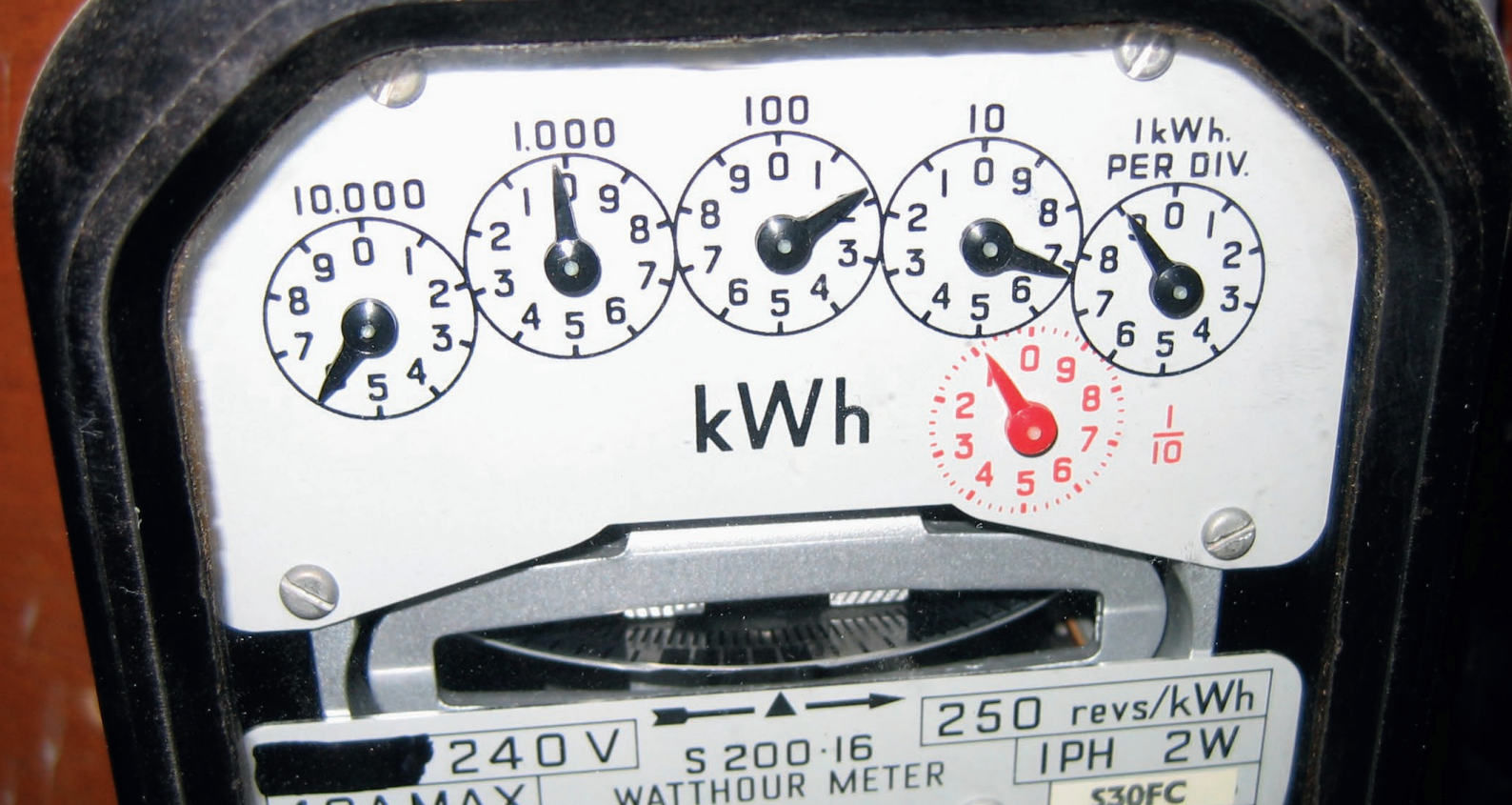
Accelerating the clean energy transition

Decarbonisation of our energy system will enable us to keep our planet healthy and will also prevent future increases in energy prices. The transition to a decarbonised society is inevitable, and the energy sector plays a crucial role. We must move away from fossil fuels and replace them with renewable energy. This will lead to many benefits, including a reduction in greenhouse gas emissions, diversification of energy supplies and greater energy security.

Around two-thirds of global greenhouse gas emissions come from the supply and use of energy from fossil fuels.²

Preventing future price increases while reducing reliance on Russia

The evolution of the conflict in Ukraine is uncertain, as is the ability of the EU to rely on energy imports from Russia. High energy prices are set to stay for a longer period of time, which means Europe must start acting now to reduce reliance on Russia as fast as possible. In order to ensure a faster transition to a clean energy system, we need to diversify our energy sources, join forces in purchasing and storing gas, build interconnections and accelerate deployment of renewable energy.



In the EU in 2019, the dependency rate was equal to 61%, which means that more than half of the EU's energy needs were met by net imports. The dependency rate on energy imports has increased since 2000, when it amounted to 56%.³

Our vision of the future energy system

Production and use of energy are necessary for the normal functioning of our society but we need to implement bold changes to ensure that energy is equally accessible for all citizens and the use of it is not harmful for the environment. Renewable energy solutions have to be available to all, energy should be affordable in every corner of Europe, and the health of our planet must be secured for future generations. The missing links for achieving a true Energy Union must be addressed so that everyone can benefit. The implementation of the Green Deal is the answer for increasing social fairness, for decarbonising the energy system and for strengthening the EU's resilience.

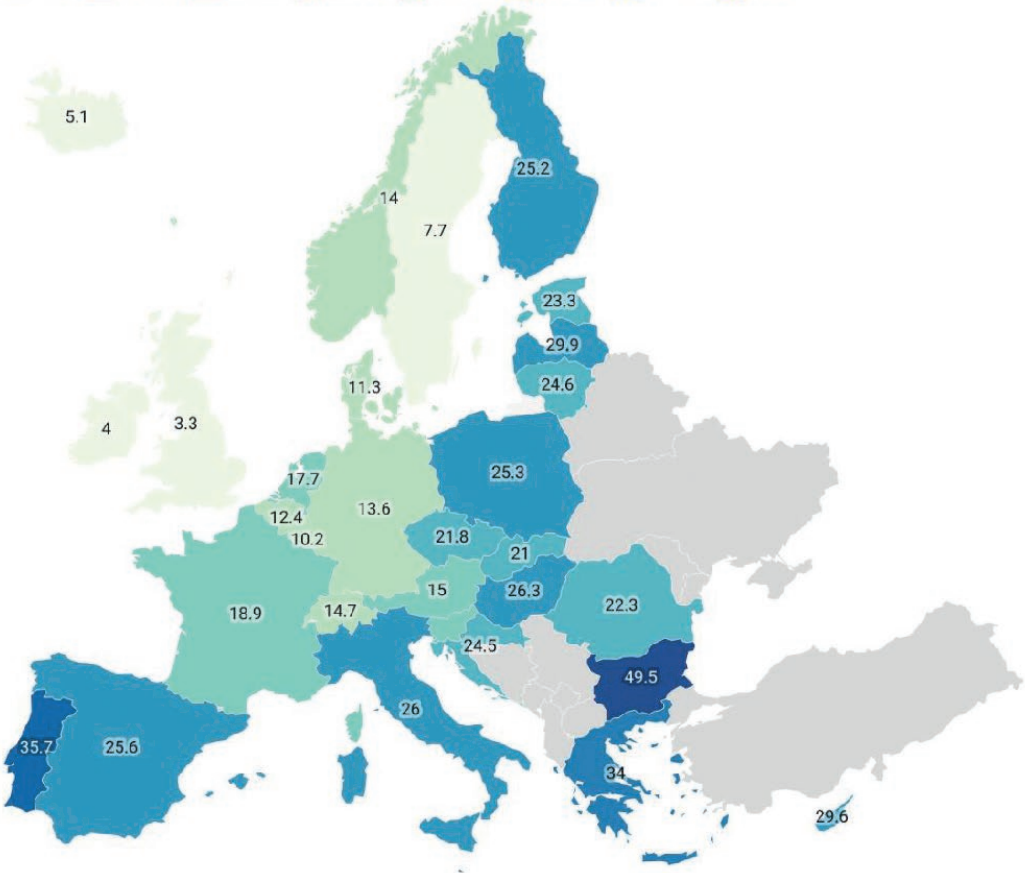
¹ Eurostat database https://ec.europa.eu/eurostat/databrowser/view/sdg_07_60/default/table?lang=en

² IRENA (2017) Climate policy drives shift to renewable energy https://www.irena.org/-/media/Files/IRENA/Agency/Topics/Climate-Change/IRENA_Climate_policy_2017.pdf

³ Eurostat "From where do we import energy?" <https://ec.europa.eu/eurostat/cache/infographs/energy/bloc-2c.html#carouselControls?lang=en>

Share of population living in a dwelling not comfortably cool during summertime (2012)

■ < 10
 ■ 10-15
 ■ 15-20
 ■ 20-25
 ■ 25-30
 ■ 30-35
 ■ 35-40
 ■ ≥ 40





While energy poverty is a problem across societies all over Europe, women are particularly affected by this problem. Yet, due to a lack of gender-disaggregated data, the female face of energy poverty remains invisible, which makes a targeted approach more difficult.

Regressive effects of carbon pricing can be reduced via more progressive designs, such as providing direct income support to energy end-users who are at the lowest end of the energy consumption scale. Energy poverty is already an issue in many Member States and the implementation of the Fit for 55 package might exacerbate the current situation if adequate social support measures are not simultaneously created and implemented. It is necessary that the EU and its Member States accelerate implementation of existing policies that address energy poverty and poverty in general, while putting in place new policies that will address the negative impact that can occur on the way towards a climate neutral future. As the green transition moves forward, EU citizens will experience numerous socio-economic improvements, from new green jobs to better health and wellbeing due to decreased pollution. At the same time, decarbonisation policies will also have redistributive consequences, and energy poverty could deepen in default of mitigation measures.

A just transition must remain the main guiding objective when it comes to all policies we put in place,

ensuring that the costs are shared equally. The proposal for a Social Climate Fund,⁷⁶ which is meant to provide funding that Member States can use to compensate the most vulnerable citizens, is a significant step forward in achieving this goal. EU-level and national policies and legislation for a transition to a carbon-free economy need to be checked for their impact on poorer households, and vulnerable persons, ensuring that every policy implemented is socially fair and just. Access to energy for everybody to heat, cool or fuel their apartment or house to an acceptable standard and at an affordable cost should be guaranteed as a social right.

By investing in renewable energy like solar panels, European households can save a lot of money. However, financing investment in renewable energy is still a difficult task for many Europeans. It can be costly, difficult to organise and carry out. Benefits from energy savings might be uncertain or poorly explained and understood, as well as difficult to measure and monetise. Climate literacy (i.e., common knowledge base on climate change) also plays a key role. Education to expand the understanding of climate policies and measures should be developed for Europeans of all ages in theoretical and practical way, together with local stakeholders. It would ensure more energy democracy, combat disinformation, and make it easier for every EU citizen to benefit. We have to make renewable energy more available for everyone.

POLICY PROPOSALS

- Rising energy prices and the need to reduce energy consumption can be addressed with energy-efficient and just renovation. Member States should work quickly to increase the renovation rate.⁷⁷ New European Bauhaus initiative can be used to find new solutions for sustainable renovation and living.
- Energy-efficiency measures must prioritise low-income households and vulnerable persons, earmarking public funds targeting poorer households and ensuring that no additional costs in housing rents or energy bills are passed on.
- Green transition policies need to address the substantial barriers which low-income households face when they want to use energy efficiency measures or shift to renewable energy sources.
- Member States should use available national and EU funding to invest in renovation and the building of new affordable, energy-efficient social housing, as well as community housing projects. Regulation of the housing market is essential to achieve affordable rents and tackle energy poverty.
- Broader structural problems surrounding energy poverty should be dealt with in a systematic and comprehensive manner, next to fiscal policies supporting the low carbon transition. This can be done by for example, financially and technically supporting neighborhoods, cities and regions to address domestic energy deprivation via the development of affordable and locally-sourced low carbon energy, reducing individual energy needs, facilitating energy efficiency investment (particularly in the private rented sector, housing in multiple occupancy, and apartment blocks) but also by eliminating existing inequalities, for instance due to gender, income, age, disability, ethnicity or sexual identity and their intersections, that hamper participation in society and access to clean and affordable energy.
- The EU should enhance the visibility of small-scale local projects to inspire other local and national governments and support their replication.
- One recurring challenge in addressing energy poverty is to clearly identify the households that suffer from energy poverty. Local level action is particularly useful to leverage the existing local civil society actors who are already engaging with local citizens, especially those who are the most likely to be at risk of energy poverty.
- A Europe-wide definition of energy poverty should explicitly take into account vulnerabilities to access to clean and renewable energy. It should reflect the inequalities that are persisting across Europe due to gender, disability, sexual orientation, age, and other factors, and their intersections.
- Collection of gender-disaggregated data can help to better address the gendered impacts of energy policies.

POLICY PROPOSALS

- Building renovations and the development of alternative, renewable sources of energy should reach not just urban but also rural and remote areas. In this context, the potential of finding local solutions is to be taken strongly into account.
- Social components of each proposal under the Fit for 55 package should be examined ex-ante, including on the impacts of measures due to gender, income, age, disability, ethnicity or sexual identity and their intersections, ensuring that the package as a whole is socially fair.
- Measures proposed by the Commission in a Council Recommendation on addressing the social and labour aspects of the green transition, published in December 2021,⁷⁸ should be used by the Member States as guidance for ensuring that distributional impacts of the transition are addressed while taking into account national differences.
- The funding available under the Social Climate Fund should be adequate to address the potential negative effects of the introduction of carbon pricing for buildings and road transport.
- Consumers should be placed at the core of energy policies. Member States should put in place measures that will ensure consumers are better informed about energy consumption, prices, existing suppliers and possibilities to reduce consumption. All citizens, regardless of their place of living, should have access to consumer organisations and energy agencies that can provide advice on energy consumption, pricing and energy efficiency.
- Member States should ensure that every citizen can benefit from renewable energy. Barriers to using renewable energy, be it lack of awareness or any financial, administrative or legislative aspect, should be identified and eliminated.
- Member States should adopt ambitious actions against energy poverty. In some National Energy and Climate Plans energy poverty still remains addressed in a fragmented or insufficient manner by national governments.⁷⁹
- The implementation of the Fit for 55 package should be followed by monitoring mechanisms that can help understand the drivers of energy vulnerability in relation to the low carbon transition and structural socio-economic changes.

4.1.2 LABOUR MARKET INTERVENTIONS AND JOB CREATION

Transition to a renewables-based energy sector will cause major restructuring of the labour market. Some jobs will disappear while new ones are created offering employment opportunities for people coming from a range of occupational profiles and backgrounds. Renewable energy sector employment has been continuously increasing in the last decade and recent studies show that renewable energy projects can offset job losses in extractive industries and can create a net employment gain.⁸⁰ The energy sector could face massive shortages in professional profiles and adequate skills for supporting its green transformation if we do not put in place preventative measures.

Ensuring a fair transition requires that governments understand how structural changes affect different regions and populations so that measures to mitigate negative impacts can be put in place. Existing workers' knowledge and skills, as well as their supply and demand, must be identified and analysed by individual Member States in collaboration with social partners, as they are often country specific.⁸¹ Trade unions must be actively involved in the development of skills strategies and active labour market policies through social dialogue. They should also be supported through capacity building to enable them to play their role in developing and preparing for green jobs.

Adequate training and education should be provided for those who are still in education and for those that come from sectors that will be reducing employment, such as the coal sector. Coal sector workers can find new opportunities in renewables, as it has been shown that targeted recruiting of coal miners for work in the solar and wind sectors can help offset loss of jobs. For example, a United States-based study found that 43% of coal-fired power plant workers could be transitioned to the solar PV power sector without additional training.⁸² Transferrable skills can be identified, but adequate funds for reskilling of the workforce are also necessary. Partnerships between governments, industry and trade unions can play an important role in facilitating the shift for workers and securing their wellbeing.

Labour market interventions to help match workers with new jobs and ensure timely filling up of work placements should encompass adequate employment services (matching jobs with qualified applicants; promoting employee wellbeing; facilitating on- and off-job training and implementing job safety nets), along with measures to facilitate labour mobility, such as relocation grants. Industry and educational institutions should cooperate to ensure more coordinated skill-matching efforts.⁸³



Workers should not only be helped to acquire skills that are needed but should also have jobs of good quality. Measures to support income stability through unemployment insurance and other programmes, policy incentives for employers to retain (and retrain) workers where possible, and longer-term employment contracts offering job stability, are all important to ensure a decent living for workers.

Realising the potential of the energy transition requires enabling participation of all workers, also those from underrepresented or marginalised groups. Women, for instance, account for only 32% of the

renewable energy workforce.⁸⁴ Parts of the renewable energy sector are far less open to women. For instance, in the wind sector, women represent only 21% of the workforce. When it comes to STEM-related roles the disparity widens further with women holding only 28% of STEM jobs across all renewables, compared to 45% of administrative roles.⁸⁵ To promote employment inclusion in the green energy sector of disadvantaged groups, the potential of the social economy should be recognised. It can promote the employment of people with disabilities, amongst others, while developing innovative actions in the green economy with clear social wellbeing objectives.

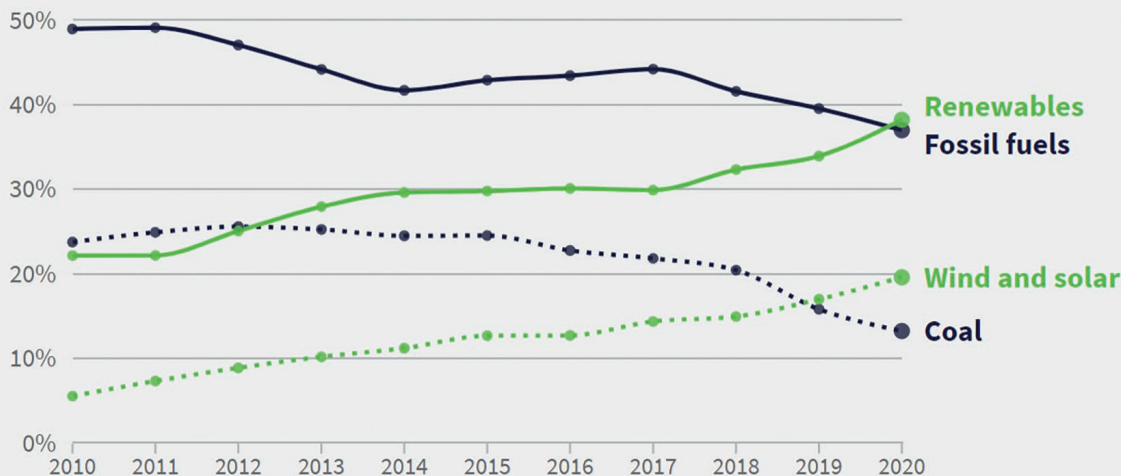
POLICY PROPOSALS

- Vulnerable workers and their communities should not shoulder an unfairly large burden due to labour market restructuring.
- Reskilling and upskilling measures will be vital for extending the employment benefits of the transition along the value chain and across all EU countries and regions. National governments should identify and fill in the gaps in training and education that can hamper employment in the renewable energy sector.
- Skills strategies and active labour policies should be developed with the strong involvement of social partners.
- Member States should provide high-quality and inclusive education and training that equips learners with skills and competences relevant for the green transition.
- Access to training at all career stages should be increased.
- Educational and work-place measures should be put in place to increase employment of under-represented, vulnerable and disadvantaged groups. This encompasses measures such as: early exposure to renewable energy careers; targeted scholarships and funded training opportunities; and mentorships and apprenticeship schemes. Targeted measures are required also to recruit and retain women and other under-represented or marginalised groups and offer opportunities for career advancement.
- Member States must ensure the effective implementation and enforcement of existing rules on working conditions, such as those concerning occupational health and safety, work organisation and involvement of workers.
- Member States should take steps to strengthen public employment services to support labour market transitions, as well as labour inspectorates to safeguard working conditions.
- New employment opportunities in the renewable energy sectors should be used to strengthen job quality and further develop dialogue between workers and employers and increase the quality of jobs compared to traditional energy sectors.
- The potential of the social economy to create quality jobs with a social purpose in the green economy, and to promote the employment of disadvantaged groups, should be explored and adequately supported.
- Social partners at national, regional and local levels should be involved in all stages of policy-making.

Renewables overtake fossil fuels

EMBER

% share of electricity production in EU-27



4.2 EU ENERGY MIX DOMINATED BY RENEWABLES

Renewable energy generation is at the core of the green transition, increasing year by year.⁸⁶ While a global energy transition is underway, further action is needed to reduce carbon emissions and mitigate the effects of climate change. Renewable energy and energy efficiency measures can potentially achieve 90% of the required carbon reductions globally.⁸⁷ The use of renewable energy has many benefits, including a reduction in greenhouse gas emissions, the diversification of energy supplies and a reduced dependency on fossil fuel markets.

Renewable energy sources include:

- **wind power**
- **solar power**
(thermal, photovoltaic and concentrated)
- **hydro power**
- **tidal power**
- **geothermal energy**

- **ambient heat captured by heat pumps**
- **biofuels**
- **the renewable part of waste.**⁸⁸

The share of renewable energy consumption varies across Member States. In 2019, countries with the highest shares of renewable energy in final consumption were Sweden (56%), Finland (43%), Latvia (40%) and Denmark (37%). On the other end of the scale are Belgium (9.9%), Netherlands (8.7%), Malta (8.4%) and Luxembourg (7%). When looking at the national targets, fourteen Member States have already surpassed their targets for 2020.⁸⁹

The growth in electricity generated from renewable energy sources during the period 2009 to 2019 largely reflects an expansion in three renewable energy sources across the EU, principally wind power, but also solar power and solid biofuels (including renewable wastes).⁹⁰

In 2020, renewables overtook fossil fuels to become the EU's main source of electricity for the first time. Wind generation rose 9% in 2020 and solar generation rose 15%. Together they generated a fifth of Europe's electricity in 2020.

The increase in renewables is still too slow – wind and solar generation growth must nearly triple to reach Europe's 2030 green deal targets.⁹¹ European countries have different systems, different levels of ambition and different funding and investment capabilities. There are a few factors to consider in the roll out of renewable energy – costs; storage, transmission and system flexibility; land use and impact on communities; and the future of the energy market.

4.2.1 COSTS RELATED TO THE ROLL OUT OF RENEWABLES

Distortions that favour the uptake of fossil fuels by market structures need to be eliminated and a fiscal system established that actively supports the adoption of energy transition solutions, while disincentivising new and existing traditional solutions not aligned with climate ambitions. This involves phasing out existing fossil fuel subsidies, and levying the environmental, health and social negative externalities of fossil fuels, as well as removing all existing support for the fossil fuel industry. For instance, in Sweden, the taxation of fossil fuels has been a major driver for renewable heat.⁹² Interventions should always be preceded by a careful assessment of their social and

equity dimensions, particularly their effects on low-income populations, to ensure that they do not cause socially regressive effects. Greater public and private financing needs to be mobilised and made more equitably accessible to end users and enterprises through local financing institutions.

High capital costs are generally considered as one of the barriers to the rollout of renewable energy technologies.⁹³ Approximately 75% of the total cost of energy for a wind energy project is related to upfront costs such as the cost of the wind turbine, foundations, electrical equipment and grid connection.⁹⁴



However, operation costs for the long-term are much smaller compared to fossil fuel technologies where as much as 40-70% of costs are related to fuel and operation and maintenance for their entire lifetime.⁹⁵ Hence, the expense would primarily come from building these technologies. However, in the long-term, next to the great benefit of protecting our planet, renewables can provide significant savings.

Renewables are not only increasingly cheaper than new fossil fuel-fired power generation, but increasingly undercut the operating costs alone of existing coal-fired power plants. Studies show that in Europe in 2021, coal-fired power plant operating costs are well above the costs of new solar photovoltaic and onshore wind. Analysis for Germany and Bulgaria shows all the coal-fired plants studied have higher operating costs today than new solar photovoltaic and onshore wind.⁹⁶ The typical lifetime of an old wind farm is 20 years, although there are projects in the EU that have been operating for longer and extending the life of wind farms is an active area of research.⁹⁷

Although in the long-term renewable energy is cheaper to produce, building renewables requires significant amounts of minerals and metals. The demand

for such materials is set to increase rapidly in the next 20 years as we accelerate the green energy transition. Wind turbines require concrete, steel, iron, fibreglass, polymers, aluminium, copper, zinc and rare earth materials (REEs). Rare metals (such as, indium, gallium, tellurium, neodymium, dysprosium) are vital for the functionality of solar power, wind power and electric vehicles. Copper and aluminium are the two main materials in wires and cables and the huge expansion of electricity grids also requires a large amount of minerals and metals. The transport sector will have to move to zero-emission vehicles, which also demands significant critical metal use.⁹⁸

A huge rise in demand for critical minerals brings into question whether these materials can be supplied in a reliable manner, and whether the environmental and social consequences associated with mineral production can be managed properly. Switching to renewable energy means that we need to rethink how we interact with natural resources, no matter what the purpose of their use is. Their use should be governed by rules that will enable a sustainable, long-term use, and not a rapid depletion of limited resources. Renewable energy is critical for creating a sustainable and circular economy but we also need a circular economy for

building materials. It is necessary to consider all impacts of clean energy technologies to enable a truly sustainable development.

Bioenergy, when used in a sustainable way, is also one of the key solutions for achieving a clean energy transition. Bioenergy is the conversion of biomass – such as agricultural and forest by-products and residues, organic municipal waste, energy crops, algae, biological CO₂ – into useful energy carriers including heat, electricity and transport fuels.⁹⁹ It is one of the main sources of renewable energy in the EU and it has a potential to expand further. Increasing the use of biomass in the EU, once stricter sustainability criteria in line with the EU Biodiversity Strategy are adopted and following the cascading principle, can help diversify Europe's energy supply and is also needed in the electricity production to balance variable renewables. Biofuels, liquid or gaseous fuels, which are made from biomass, can fuel heat, transport and electricity generation. Although the EU is developing bioenergy technologies and solutions, deployment is still limited.

A systemic innovation will play a central role to drive down costs and ramp up the pace of the energy transition. A number of enabling policies can strengthen the investment and development process across various dimensions.

POLICY PROPOSALS

- **Member States should remove financial support measures for the fossil fuel industry to support development of clean energy transition solutions.**
- **There are still considerable barriers to the roll out of renewable energy projects.¹⁰⁰ The EU should simplify and accelerate the permitting of renewable energy projects through the guidance to national governments on good permitting practices to be published by early 2022.**
- **With more renewable energy in the energy mix, the EU can eliminate the most expensive fossil fuels, thus decreasing prices for end users. Investments in renewable energy should be increased including by speeding up the issuance of permits for development of clean energy infrastructure and increasing production of equipment for renewables.¹⁰¹**
- **Ensure energy infrastructure is equally well maintained, sufficiently stable and resilient to meet the demands of the future in all regions.**
- **Step up investments in trans-European networks, in order to achieve the 15% electricity interconnection target for 2030.**

4.2.2 RENEWABLE ENERGY STORAGE, TRANSMISSION, AND SYSTEM FLEXIBILITY

POLICY PROPOSALS

- **The Commission should ensure that Member States are making use of financial resources available in the EU budget and NextGenerationEU for investments in renewables.¹⁰²**
- **Reuse and recyclability of materials used in the renewable infrastructure industry should be further explored and strengthened to ensure circularity of the full supply chain to prevent resource depletion. Technology innovation for material efficiency or substitution, scaling up recycling and extending the lifetime of existing assets through better maintenance should be taken into account as we accelerate the clean energy transition.**
- **The integration of bioenergy in the overall energy system should be carried out under strict sustainability criteria to eliminate climate and environmental risks created by the increasing use of certain sources for bioenergy.**

Renewable energy does not work equally well for all countries and all regions. To cost-effectively scale up renewables, they must be sited where they are most productive – in places with plenty of sun, wind, water and land. That is typically not close to population centres where users locate, so more transmission infrastructure is required to connect supply and demand. Renewables require considerable amounts of land, which is a difficulty for some countries, like for instance, Malta. Favorable weather conditions are also necessary. This means that interconnections, transmission and storage will be key factors determining the future of renewable energy generation.

One of the major problems with renewable energy generation is that supplies are far more variable than other means of energy generation. Power generation depends on the weather conditions which means that renewable energy production can be low during some periods. The available power grid infrastructure was built to work with consistent power generation levels and these grids may not be able to cope with the inconsistency of renewable energy.

Electricity interconnections play a key role in the integration of electricity markets, allowing energy to be

exchanged between neighbouring countries. This is the objective sought by the internal energy market in Europe, which aims to integrate all of today's existing markets within the European Union. International interconnections contribute to the security and continuity of the electricity supply within those interconnected systems, thanks to the energy exchanges that take place when they are needed. Interconnections between all countries, especially those that are less interconnected due to their geographical position like Portugal and Spain,¹⁰³ should be strengthened to ensure security and continuity of electricity supply at affordable prices. For instance, the MidCat project between Spain and France could have added about 7.5 billion cubic metres of cross-border capacity, approximately doubling the amount of gas that can flow between the two countries. The pipeline was cancelled in January of 2019 after being blocked by the regulators that questioned its economic viability.¹⁰⁴ Such projects should be reconsidered in light of the current circumstances, while making sure that the infrastructure built will also be suitable for green hydrogen.

The EU power system is going to be increasingly characterised by higher shares of variable renewables. System flexibility— the ability to absorb and manage fluctuations in demand and supply by storing energy at times of surplus and releasing it when needed, is crucial. The need for power system flexibility will rise



quickly in the coming decade, but the development of flexibility sources, such as interconnections and grids, demand a response, and energy storage is slower than renewable development.¹⁰⁵ A solution lies in developing storage technology which can help to cover those less productive periods, allowing energy end users to use energy when they need it. If we rely on renewable energy, we need to be able to make use of energy in times of need. It is not just about emergencies but also about continuous reliability and availability.

The Commission has identified a number of policy issues and barriers related to storage development, ranging from permitting, ancillary and grid management services, grid aspects; taxes and other levies; involvement of network operators and storage definition and other policy aspects.¹⁰⁶ Given current energy transition trends, awareness of the potential of storage is increasing. Deep penetration of renewables is predicted to require hours of storage, which exceeds the cost-effective range and supply capabilities for electrochemical battery technologies. The vast majority of long-duration grid-scale energy storage systems are based on mechanical systems such as pumped hydro or compressed air energy storage. Improvements to these systems and developments of other systems for cost-effective long-duration energy storage are needed.¹⁰⁷

POLICY PROPOSALS

- **Europe must address its weakness and barriers for achieving a true Energy Union to ensure that all countries can benefit from secure, sustainable, competitive and affordable energy.**
- **The more we can store energy, the more flexible we are to fully utilise renewable energy sources. Member States should take steps to increase the flexibility of the electricity grid to accommodate renewables, for example by investing in long-range transmission lines and introducing new energy storage technologies.**
- **The EU and Member States should continue providing R&I guidance and support to promising storage technologies.**
- **The European Commission, European Union Agency for the Cooperation of Energy Regulators (ACER) and other EU authorities should prioritise policy measures that address barriers to storage identified in the majority or all Member States, and that hinder the deployment of several storage technologies and applications. Relevant barriers specific to only a few Member States should be addressed at the national level.¹⁰⁸**
- **National authorities should develop a policy strategy for storage based on an assessment of the system flexibility, adequacy and stability needs, and of gaps in national regulatory frameworks. An appropriate identification of the flexibility needs per country and per timescale is key to assess the possible contribution of storage technologies in the future.¹⁰⁹**

POLICY PROPOSALS

- **National Energy and Climate Plans (NECPs) are a central instrument for Member States to provide transparency and visibility to market actors with regards to increasing the flexibility of the national energy system, including the deployment of storage technologies, and to signal the main policy actions to be undertaken. For NECPs which do not comprehensively address energy storage, Member States should be encouraged to provide further details in their future progress reports.**
- **Investments in the international interconnections between the Iberian Peninsula, the Western Balkans and the rest of the European Union should be increased to ensure adequate supply and security of electricity for every country in the EU.**

4.2.3 LAND USE AND INVOLVEMENT OF LOCAL COMMUNITIES

In the Commission's strategic long-term vision for a prosperous, modern, competitive and climate neutral economy by 2050 – A Clean Planet for All – models show that eight times more power from solar and wind would be needed to achieve climate neutrality by 2050.¹¹⁰ Such a transition would require devoting 3% of the total land in the EU to solar and, depending on wind offshore deployments, up to 15% of total land to wind energy.¹¹¹

It is often pointed out that solar and wind farms require vast amounts of land to harvest the low-density energy from the sun and wind. In contrast, coal, natural gas, and nuclear power plants require much less land than renewables for the same power. However, this argument overlooks the consequences that power plants leave on the environment for the long-term. Mining is used to extract solid fossil fuels, such as coal, by digging, scraping, or otherwise exposing

buried resources.¹¹² After that, the land is depleted and the mining companies must move on to new land. In contrast, a piece of land used for solar, wind, hydro, or biomass will continue producing energy on the same land.

Land has increasingly become of “dual-use,” simultaneously supporting livestock grazing and agriculture. Solar farms, because they are typically more densely packed than wind farms, make dual-use more of a challenge, but pilot projects all over the world are proving that panels can co-exist with grazing and certain kinds of agriculture. In addition, solar panels can be placed onto existing structures like roofs, driveways, roads, etc, thus not requiring any dedicated land.

Environmental impacts of renewable technologies vary depending on the specific technology used, the



Offshore wind power generation in Denmark

geographic location, and a number of other factors. By understanding the current and potential environmental issues associated with each renewable energy source, we can take steps to effectively avoid or minimise them as we increase our reliance on renewables.

Through the Clean energy for all Europeans package,¹¹³ the EU has introduced the concept of energy communities in its legislation, differentiating between citizen energy communities and renewable energy communities. They were given a legal definition only in 2019, 40 years after their emergence.¹¹⁴ Energy communities are a way to set up decentralised forms of energy production to provide energy to local communities and can be developed into different types of legal entities. Citizens can join in energy communities, pooling their energy, and benefit from incentives for renewable energy production. The Middelgrunden Wind Farm in Denmark is one example of a large-scale community co-owned energy project. It was developed in 2000 just 3.5 km outside the harbour of Copenhagen. 50% of the Middelgrunden Wind Farm is owned by the local utility held by the City of Copenhagen, and the other 50% is held by members of the Middelgunden Vindmollelaug I/S.

The Middelgunden Vindmollelaug I/S is a general partnership of citizens, of which each member holds a different share. Private individuals are attracted to invest in the Middelgrunden Wind Farm by a low personal risk since the partnership cannot incur debt. and each member has one vote in important decisions regardless of the amount of shares owned.¹¹⁵

According to European Commission estimates, by 2030, energy communities could own 17% of installed wind capacity and 21% of solar. By 2050, almost half of EU households are expected to be producing renewable energy.¹¹⁶ Moving to a more decentralised energy system where consumers play an active role means more democracy, and more opportunities for citizens to take their own decisions on which type of energy they want to use. Empowering renewable energy communities to produce, consume, store and sell renewable energy will also help advance energy efficiency in households, support the use of renewable energy and at the same time contribute to fighting poverty through reduced energy consumption and lower supply tariffs.

POLICY PROPOSALS

- With a largely decarbonised electricity system, high penetration rates of renewable energy will require more land to be occupied. The EU must ensure that the need for power is balanced with the need to make optimal use of land, compatible with climate adaptation and biodiversity protection efforts, and that concerns of local communities are taken into account. Investments in renewable energy projects should respect the ‘do no significant harm principle.’
- The Commission should assess the impact they have on human habitation, agriculture and conservation of natural resources. Implications of these additional land occupation levels, including the additional transmission power lines, should be investigated in terms of habitat fragmentation and ecosystem disturbance.¹¹⁷
- Decision-making procedures concerning renewable energy projects must be fair open and transparent, the public and stakeholders have a voice in decisions, and these inputs should be given consideration by the decision makers.
- Member States should foster and accelerate development of renewable energy communities through a stable regulatory framework suitable for differing local contexts. It should be ensured that every citizen has an opportunity to be included, especially the most vulnerable groups.

4.2.4 AN ENERGY MARKET ADAPTED TO AN INCREASING SHARE OF RENEWABLES

While the benefits of renewables are clear, it seems that they are not always passed on to consumers. Even when energy generation costs are low, it is possible for prices for citizens to actually increase. Consumers are not always able to capture the low-price moments in the electricity market. The EU’s electricity pricing system operates on a system of marginal pricing, also known as a pay-as-clear market, meaning that everybody gets the same price for the electricity they are producing at that moment. Electricity producers bid into the market, setting their price according to their production cost. The bidding

goes from the cheapest to most expensive and the cheapest electricity is bought first. Once the full demand is satisfied, everybody obtains the price of the last producer from which electricity was bought. Wholesale electricity costs reflect the price of the last unit of energy bought via auctions held in Member States.¹¹⁸ Even in countries like France where the primary source of electricity generation is nuclear, gas can still be the driving force of electricity prices. Marginal pricing means all suppliers in the market, including cheaper wind or solar installations, get the price paid for the most expensive offer accepted.

Share of energy from renewable sources in the EU Member States

(2017, in % of gross final energy consumption)



ec.europa.eu/eurostat

In the transition towards having more renewable energy, we need to think about how to bridge the gap between consumer demand and the electricity supply that can be generated by renewable sources. Consumers across Europe must be able to benefit from cheaper renewable technologies. In response to the energy market failing to deliver affordable energy, some countries have suggested considering alternative market designs. ACER¹¹⁹ found that alternative market design approaches, such as price caps or technology dependent average prices, may jeopardise some of the benefits of EU energy market integration and

endanger the security of supply over the medium and potentially also the shorter term. Member States might experience increasing shares of intermittent renewable generation in their electricity mix which means the volatility of wholesale prices is likely to increase. In applying certain price caps or technology-dependent average prices, if each market area (bidding zone) would apply its own 'fair price' concept, the consequences could be significant, both for decarbonising the European economy at lower cost and for maintaining supply security and system resilience going forward (as price and system shocks risk being less mitigated via contributions from neighbouring areas). This could lead to a less integrated market.

Although cautious on the need to completely redesign the EU electricity market, ACER's analysis concluded that there is significant scope for further improving energy market integration in Europe and that the fact that the energy market worked well until now, does not mean it is future-proof. A crucial component of improving the current situation is building interconnections. The higher the gas dependency and the lower the level of interconnection compared to national demand, the higher the wholesale price of electricity in a given Member State. This means that interconnection capacities must increase significantly, thus ensuring that all countries and all citizens can benefit from low prices.

The Commission should regularly assess, study alternative market designs and ensure that, as we switch to more renewables-based energy mix, citizens can benefit from cheaper energy production costs. Although the roll out of renewables has not reached its peak, the nature of it requires further assessment and consistent monitoring, in order for the EU to be ready, if necessary, for a different energy market than the one we have currently in place.

POLICY PROPOSALS

- **The EU should not lower its climate ambitions as a result of the current crisis but should instead accelerate deployment of renewable energy solutions.**
- **The Commission should assess the current electricity pricing system to explore alternatives that could help consumers capture the benefits of low renewables energy production costs.**
- **Power systems in the EU are undergoing significant change, driven particularly by the increasing availability of low-cost variable renewable energy, advances in digitalisation and growing opportunities for electrification. These changes require a profound power system transformation. The Commission should explore options for alternative market designs better adapted to the higher share of renewables and monitor how the market adapts.**



4.3 THE ROLE OF GREEN HYDROGEN

Hydrogen is expected to play a major role in the clean energy transition and its large-scale deployment is necessary for achieving our climate targets. ‘Green’ or ‘clean’ hydrogen, when produced with the use of renewable energy, does not emit CO₂ and produces almost no air pollution when used. It can be used to carry and store energy, as a fuel and as an energy feedstock. The majority of hydrogen used today is grey hydrogen, which is produced from fossil fuels. Since grey hydrogen is not decarbonised, green hydrogen, produced through the electrolysis of water with the electricity stemming from renewable sources, should be prioritised.

Green hydrogen is currently less competitive than grey hydrogen. To be able to produce green hydrogen on a larger scale, the EU must accelerate the roll out of renewables, accelerate investments, incentivise the creation of new lead markets, support research and innovation into breakthrough technologies, and build a large-scale infrastructure network that connects countries within the EU but also the EU with third countries. Renewable hydrogen should progressively be deployed at large scale alongside the rollout of renewables, as

technology matures and the costs of its production technologies decrease. A progressive uptake of hydrogen solutions can also lead to repurposing or re-using parts of the existing natural gas infrastructure.

The use of clean hydrogen can help decarbonise, in particular, energy intensive industries (e.g. steel, chemicals and cement), the transport sector (e.g. heavy duty vehicles, rail and maritime), and the power sector. Renewable energy sources are intermittent and hydrogen can be used to capture and store this energy.

In 2020, the Commission adopted a new dedicated strategy on hydrogen in Europe¹²⁰ which provides targets for investment, action for boosting demand and scaling up production, action for promoting research and innovation and measures for strengthening international cooperation and leadership. All actors, public and private, at European national and regional level, must work together, across the entire value chain, to build a dynamic hydrogen ecosystem in Europe.

POLICY PROPOSALS

- For hydrogen to have a positive role in the clean energy transition, it must be produced and delivered in a sustainable manner. Green hydrogen produced with the use of renewable energy should be prioritised in the long-term.
- The EU should step up its shift towards green hydrogen and accelerate investments to reach the targets set out in the Commission strategy on hydrogen.
- The Hydrogen and gas markets decarbonisation package¹²¹ presented in December 2021 should ensure that barriers that hamper the development of the hydrogen market and its infrastructure are removed and that natural gas infrastructure can be reused for hydrogen.
- The hydrogen value chain could employ more than one million people by 2030 and five times as many by 2050.¹²² Young people just starting their education, as well as those that need to be reskilled, must have access to adequate education that will help research, innovation and deployment of green hydrogen. Partnerships between governments, industry and trade unions should accelerate development of new education and training programmes.
- Legislative proposals under the Fit for 55 package that include provisions aiming to support greater development and use of green hydrogen should be supported by the EU legislators and their ambition should be increased whenever possible.
- The EU should strengthen its leadership on hydrogen on the international level and promote cooperation with third countries.

4.4 TRANSITIONING FROM FOSSIL FUELS TO RENEWABLES - ROLE OF NUCLEAR ENERGY AND FOSSIL GAS

The European Commission is attempting to finish its sustainable finance taxonomy,¹²³ which defines economic activities that can be labelled as sustainable investment in the EU, based on whether they meet strict environmental criteria. Following the political agreement on the Taxonomy Regulation¹²⁴ between co-legislators, in 2020 the Commission launched in-depth work to assess whether or not to include nuclear energy and fossil gas in the EU taxonomy of environmentally sustainable activities. Their inclusion has been the subject of heated debate at the EU level, especially in the context of the clean energy transition and skyrocketing energy prices.

In its proposal,¹²⁵ the Commission argues that the fossil gas and nuclear energy sectors can contribute to the decarbonisation of the Union's economy. On the basis of scientific opinions and taking into account the current technological progress as well as the varying difficulties faced by Member States in the energy transition, the Commission considers that "there is a role for natural gas and nuclear as a means to facilitate the transition towards a predominantly renewable-based future". However, a series of conditions for nuclear and fossil gas activities are provided for.

European countries and governments across the political spectrum are split when it comes to their stance on nuclear energy. On one side are those that see nuclear energy as a strong tool for decarbonisation and support its use. On the other side are countries that want to focus on renewables only, and do not consider nuclear energy to be the right solution. This division

exists also between social democratic governments in Europe.

Those that expressed their support for having nuclear energy investments labelled as green argue that nuclear power is one of the most low-carbon energy sources, it has a high power output, low operating costs and does not depend on weather conditions like renewables, making it more reliable. However, unsolved issues remain concerning its safety and storage of radioactive waste. In addition, the length of time it would take to build new nuclear power plants and make them operational is much longer than it is for renewables. In addition, when factoring in the public subsidies nuclear energy receives, its operating costs might not be that low. An analysis in the US suggests that unsubsidised average electricity generating costs declined between 2015 and 2020 in the case of solar PV and onshore wind, while nuclear power costs went up.¹²⁶ The costs of building nuclear power plants are high, while costs of renewables are decreasing. A big concern is the possibility of malfunctions or accidents, which can leave catastrophic consequences that can extend beyond national and EU borders. Nuclear energy requires uranium to produce energy and it is not an endless resource. Although supply of uranium is high today, one day it will begin to drop, especially if more nuclear energy plants are built, requiring the need for more uranium. Uranium must be mined unlike wind or solar power, which offers an unlimited supply.

Some countries have supported the use of natural gas in the transitional period and European Commission



Executive Vice-President for European Green Deal Frans Timmermans visits the SSAB fossil-free steel plant in The Netherlands

Executive Vice-President Timmermans acknowledged that natural gas will probably be necessary to shift from coal to sustainable energy and has a role to play in the transitional period. An abrupt transition to renewable energy might lead to energy scarcity and further increase energy bills for consumers, which is why a more gradual transition is needed.

The debate around the role of nuclear energy and fossil gas has been associated with the EU taxonomy. As pointed out by the S&D Group in the European Parliament¹²⁷ and the EU Platform on Sustainable Finance,¹²⁸ labelling these energy sources as green is not in line with science and considering them sustainable could send wrong signals to market investors. Their exclusion would still not prevent Member States from investing in them, as every country can still choose its energy mix.

While there is no consensus yet within our membership to completely phase out nuclear energy throughout Europe, the PES supports member parties in developing strategies to reach a share of 100% renewable energy until 2050. The use of nuclear energy and fossil gas can serve as a bridge to renewables, but it should in no circumstances lead to a lock-in. In the long run, Europe should phase out use of nuclear power completely.

POLICY PROPOSALS

- **Investments and scaling up of renewables should be a priority for the EU and its Member States. The EU should support Member States that want to phase out nuclear power plants.**
- **Each Member State has the freedom to choose its energy mix. Where nuclear installations exist, the protection of people and the environment must be a priority, with regular safety reviews and strict monitoring and reporting.**
- **Member States that decide to use nuclear energy and fossil gas in the transitional period should ensure that incentives for renewable energy development are not hampered, that a lock-in is avoided and should demonstrate in a transparent and detailed basis how their strategies will lead to decarbonisation and avoid a lock-in.**

5 CONCLUSION

Workers and families are suffering due to skyrocketing energy prices, as a result of which energy poverty will only grow across Europe. The EU must act now to support and protect households and businesses as we approach winter. It must be ensured that the current situation does not happen again in the future. Since the EU is set to reach its 2030 and 2050 climate targets, we are putting in place policies that will drive down emissions faster. To tackle the climate crisis, a rapid change in the way we produce and use energy is needed. We need to scale up the roll out of renewables and decarbonise the energy sector to avoid steep price increases in the future and strengthen our strategic autonomy. This is important not only from an environmental point of view but also from the health and wellbeing perspective. Decarbonisation policies must have an inherent social dimension that will safeguard those who are most vulnerable and ensure that the costs of the transition are shared equally. The environmental and the social dimension are two inseparable components of the European Green Deal. Citizens are facing numerous challenges in trying to adapt to the new realities. It is crucial to ensure that consumers will have access to clean and affordable energy now, and as we progress further in the green transition. As we do this, we must guarantee support for those who need it most, every step of the way.

NOTES

- 1 European Commission Communication REPowerEU: Joint European Action for more affordable, secure and sustainable energy COM(2022) 108 final
- 2 EU Energy Poverty Observatory website: What Is Energy Poverty?, <https://www.energypoverty.eu/about/what-energy-poverty>
- 3 Communication from the Commission, The European Green Deal COM(2019) 640 final
- 4 European Commission "Energy and the Green Deal" https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal/energy-and-green-deal_en
- 5 COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS 'Fit for 55': delivering the EU's 2030 Climate Target on the way to climate neutrality COM(2021) 550 final
- 6 PES Congress resolution Equal societies: A healthy environment and food, green growth and modern industries
- 7 PES Publication (2021) "Leading the way for progressive and sustainable cities"
- 8 PES Brochure (2020) "Affordable and quality healthcare for all - Conclusions of the PES Social Europe Network" June 2020
- 9 PES Publication (2021) "The Circular Transition - Towards an economy that puts people first and respects the limits of the planet"
- 10 PES Discussion paper (2021) "Healthy live in a clean environment" (in the process of being adopted)
- 11 Eurostat, "Where does our energy come from?" <https://ec.europa.eu/eurostat/cache/infographs/energy/bloc-2a.html?lang=en>
- 12 Eurostat, "Where does our energy come from?" <https://ec.europa.eu/eurostat/cache/infographs/energy/bloc-2a.html?lang=en>
- 13 Eurostat "What do we produce in the EU?" <https://ec.europa.eu/eurostat/cache/infographs/energy/bloc-2b.html?lang=en>
- 14 Eurostat "What do we produce in the EU?" <https://ec.europa.eu/eurostat/cache/infographs/energy/bloc-2b.html?lang=en>
- 15 Eurostat "From where do we import energy?" <https://ec.europa.eu/eurostat/cache/infographs/energy/bloc-2c.html?lang=en>
- 16 Eurostat "From where do we import energy?" <https://ec.europa.eu/eurostat/cache/infographs/energy/bloc-2c.html?lang=en>
- 17 Eurostat "From where do we import energy?" <https://ec.europa.eu/eurostat/cache/infographs/energy/bloc-2c.html?lang=en>
- 18 Eurostat "From where do we import energy?" <https://ec.europa.eu/eurostat/cache/infographs/energy/bloc-2c.html?lang=en>
- 19 The dependency rate is measured by the share of net imports (imports - exports) in gross inland energy consumption (meaning the sum of energy produced and net imports).
- 20 Eurostat "From where do we import energy?" <https://ec.europa.eu/eurostat/cache/infographs/energy/bloc-2c.html#carouselControls?lang=en>
- 21 Eurostat "What is the source of the electricity we consume?" <https://ec.europa.eu/eurostat/cache/infographs/energy/bloc-3b.html?lang=en>
- 22 Eurostat (2021) Coal production and consumption statistics https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Coal_production_and_consumption_statistics
- 23 European Commission DG Energy (2022) Quarterly report on European electricity markets Volume 14 (3) https://energy.ec.europa.eu/system/files/2022-01/Quarterly%20Report%20on%20European%20Electricity%20markets%20Q3%202021_v1.2.pdf
- 24 Eurostat (2021) Energy statistics - an overview https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Energy_statistics_-_an_overview#Final_energy_consumption
- 25 ACER (2021) High energy prices https://documents.acer.europa.eu/en/The_agency/Organisation/Documents/Energy%20Prices_Final.pdf
- 26 Bruegel, Simone Tagliapietra and Georg Zachmann (2021) 'Is Europe's gas and electricity price surge a one-off?' <https://www.bruegel.org/2021/09/is-europes-gas-and-electricity-price-surge-a-one-off/>
- 27 International Energy Agency (2021) "Statement on recent developments in natural gas and electricity markets" <https://www.iea.org/news/statement-on-recent-developments-in-natural-gas-and-electricity-markets>
- 28 Bruegel, Simone Tagliapietra and Georg Zachmann (2021) 'Is Europe's gas and electricity price surge a one off?' <https://www.bruegel.org/2021/09/is-europes-gas-and-electricity-price-surge-a-one-off/>
- 29 Agora Energiewende and Ember (2021) The European Power Sector in 2020: Up-to-Date Analysis on the Electricity Transition <https://ember-climate.org/wp-content/uploads/2021/01/Report-European-Power-Sector-in-2020.pdf>
- 30 COMMUNICATION FROM THE COMMISSION (2021) Tackling rising energy prices: a toolbox for action and support COM(2021) 660 final
- 31 REPORT FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS Energy prices and costs in Europe COM(2020) 951 final
- 32 Communication From the Commission (2021) Tackling rising energy prices: a toolbox for action and support COM(2021) 660 final
- 33 European Commission Communication REPowerEU: Joint European Action for more affordable, secure and sustainable energy COM(2022) 108 final
- 34 Communication From the Commission (2021) Tackling rising energy prices: a toolbox for action and support COM(2021) 660 final
- 35 Communication From the Commission (2021) Tackling rising energy prices: a toolbox for action and support COM(2021) 660 final
- 36 Eurostat "Can you afford to keep your home warm?" <https://ec.europa.eu/eurostat/web/products-eurostat-news/-/ddn-20210106-1>
- 37 Eurostat, Employment and activity by sex and age - annual data https://ec.europa.eu/eurostat/databrowser/view/lfsi_emp_a/default/table?lang=en
- 38 Eurofound (2020) "Living, working and COVID-19", COVID-19 series, Publications Office of the European Union, Luxembourg
- 39 Tina Weber (2020) "Economic downturns expose the vulnerability of a growing number of precarious workers", Eurofound <https://www.eurofound.europa.eu/publications/blog/economic-downturns-expose-the-vulnerability-of-a-growing-number-of-precarious-workers>
- 40 ETUC (2021) "Low wages leave 3 million workers without heating" <https://www.etuc.org/en/pressrelease/low-wages-leave-3-million-workers-without-heating>
- 41 Stefan Bouzarovski, Harriet Thomson & Marine Cornelis (2021) Confronting Energy Poverty in Europe: A Research and Policy Agenda, Energies, 14, 858
- 42 OECD (2020) Consumption Tax Trends 2020: VAT/GST and Excise Rates, Trends and Policy Issues, OECD Publishing, Paris, <https://doi.org/10.1787/152def2d-en>
- 43 Housing Europe (2019) State of Housing in the EU <https://www.housingeurope.eu/resource-1323/the-state-of-housing-in-the-eu-2019>
- 44 PES Publication (2021) "Leading the way for progressive and sustainable cities"
- 45 CREG (2021) Study on the increase in electricity and gas prices in Belgium <https://www.creg.be/sites/default/files/assets/Publications/Studies/F2289EN.pdf>
- 46 Global Witness (2021) Top fossil fuel companies made \$65 billion while consumers hit by gas price crisis <https://www.globalwitness.org/en/campaigns/fossil-gas/big-gas-profits/>

- 47 Communication From the Commission (2021) Tackling rising energy prices: a toolbox for action and support COM(2021) 660 final
- 48 CREG (2021) Study on the increase in electricity and gas prices in Belgium <https://www.creg.be/sites/default/files/assets/Publications/Studies/F2289EN.pdf>
- 49 European Commission Communication REPowerEU: Joint European Action for more affordable, secure and sustainable energy COM(2022) 108 final
- 50 Communication From the Commission (2021) Tackling rising energy prices: a toolbox for action and support COM(2021) 660 final
- 51 Jan Cornillie, Jos Delbeke and Christian Egenhofer (2021) 'Tackling Energy Price Shocks on the Road to Climate Neutrality' STG 17 https://cadmus.eui.eu/bitstream/handle/1814/72618/PB_2021_17_STG.pdf?sequence=1&isAllowed=y
- 52 Reuters (2021) FACTBOX-Spain's plan to tame power bills <https://www.reuters.com/article/spain-energy-factbox-idUSL8N2QG3VY>
- 53 COMMUNICATION FROM THE COMMISSION (2021) Tackling rising energy prices: a toolbox for action and support COM(2021) 660 final
- 54 European Commission Communication REPowerEU: Joint European Action for more affordable, secure and sustainable energy COM(2022) 108 final
- 55 Proposal for a Regulation of the European Parliament and of the Council amending Regulation (EU) 2017/1938 of the European Parliament and of the Council concerning measures to safeguard the security of gas supply and Regulation (EC) n°715/2009 of the European Parliament and of the Council on conditions for access to natural gas transmission networks COM(2022) 135 final
- 56 European Commission Communication REPowerEU: Joint European Action for more affordable, secure and sustainable energy COM(2022) 108 final
- 57 European Commission Communication Security of supply and affordable energy prices: Options for immediate measures and preparing for next winter COM(2022) 138 final
- 58 Euractiv "Draghi to Club Med Leaders: energy challenge most urgent" https://www.euractiv.com/section/politics/short_news/draghi-to-club-med-leaders-energy-challenge-most-urgent/?utm_source=piano&utm_medium=email&utm_campaign=19683&pnespid=srlkEjlfaxD2P3L.TikSi6d4h6zCMR6l.O3O_x38w9myuep6Rd_CDeCh5ISl6k9ELOMnNUOsQ
- 59 Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL amending Regulation (EU) 2017/1938 of the European Parliament and of the Council concerning measures to safeguard the security of gas supply and Regulation (EC) n°715/2009 of the European Parliament and of the Council on conditions for access to natural gas transmission networks COM(2022) 135 final 2022/0090 (COD)
- 60 COMMUNICATION FROM THE COMMISSION (2021) Tackling rising energy prices: a toolbox for action and support COM(2021) 660 final
- 61 Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the internal markets for renewable and natural gases and for hydrogen (recast) COM(2021) 804 final 2021/0424(COD)
- 62 European Commission Communication REPowerEU: Joint European Action for more affordable, secure and sustainable energy COM(2022) 108 final
- 63 European Commission (2022) Communication from the Commission Security of supply and affordable energy prices: Options for immediate measures and preparing for next winter COM(2022) 138 final
- 64 European Commission Communication REPowerEU: Joint European Action for more affordable, secure and sustainable energy COM(2022) 108 final
- 65 European Council meeting (24 and 25 March 2022) – Conclusions EUCO 1/22 CO EUR 1 CONCL 1
- 66 Non-paper on energy and electricity markets submitted by the Spanish Government to the European Commission (2021) <https://www.euractiv.com/wp-content/uploads/sites/2/2021/10/Spanish-Annex-20210920-Non-Paper-on-Energy-markets.pdf>
- 67 Communication from the Commission (2021) Tackling rising energy prices: a toolbox for action and support com(2021) 660 final
- 68 COMMUNICATION FROM THE COMMISSION (2021) Tackling rising energy prices: a toolbox for action and support COM(2021) 660 final
- 69 European Commission Communication REPowerEU: Joint European Action for more affordable, secure and sustainable energy COM(2022) 108 final
- 70 European Commission Communication REPowerEU: Joint European Action for more affordable, secure and sustainable energy COM(2022) 108 final
- 71 Non-paper on electricity, gas and ETS markets https://www.politico.eu/wp-content/uploads/2021/10/25/1.2-NON-PAPER-ON-ELECTRICITY-GAS-AND-ETS-MARKET-ENG.pdf?utm_source=POLITICO.EU&utm_campaign=92f0a10663-EMAIL_CAMPAIGN_2021_10_26_04_19&utm_medium=email&utm_term=0_10959edeb5-9
- 72 European Commission Communication REPowerEU: Joint European Action for more affordable, secure and sustainable energy COM(2022) 108 final
- 73 Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL amending Directive (EU) 2018/2001 of the European Parliament and of the Council, Regulation (EU) 2018/1999 of the European Parliament and of the Council and Directive 98/70/EC of the European Parliament and of the Council as regards the promotion of energy from renewable sources, and repealing Council Directive (EU) 2015/652 COM(2021) 557 final
- 74 COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS 'Fit for 55': delivering the EU's 2030 Climate Target on the way to climate neutrality COM(2021) 550 final
- 75 The revision of the ETS, the Effort Sharing Regulation, revision of the Energy Tax Directive, revision of the Renewable Energy Directive, revision of the Energy Efficiency Directive, revision of the energy performance of Buildings Directive and the revision of the third energy Package for gas.
- 76 Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing a Social Climate Fund 2021/0206 (COD) SWD(2020) 176 final
- 77 PES Publication (2021) "Leading the way for progressive and sustainable cities"
- 78 European Commission Proposal for a Council Recommendation on ensuring a fair transition towards climate neutrality {SWD(2021) 452 final}
- 79 LIFE Unify (2020), "Tackling energy poverty through National Energy and Climate Plans: Priority or empty promise?" https://caneurope.org/content/uploads/2021/01/Energy-poverty-report-Final_December-2020.pdf
- 80 ILO Green jobs and renewable energy: low carbon, high employment https://www.ilo.org/wcmsp5/groups/public/---ed_emp/---emp_ent/documents/publication/wcms_250690.pdf
- 81 IRENA (2021), World Energy Transitions Outlook: 1.5°C Pathway
- 82 Marston J. (2018), "Why these companies turn to coal country for skilled workers", www.edf.org/blog/2018/05/08/why-these-companies-turn-coal-country-skilled-workers
- 83 Marston J. (2018), "Why these companies turn to coal country for skilled workers", www.edf.org/blog/2018/05/08/why-these-companies-turn-coal-country-skilled-workers
- 84 IRENA (2019) Renewable Energy: A Gender Perspective

- 85 IRENA (2020) Renewable Energy: A Gender Perspective
- 86 Agora Energiewende and Ember (2021) The European Power Sector in 2020: Up-to-Date Analysis on the Electricity Transition <https://ember-climate.org/wp-content/uploads/2021/01/Report-European-Power-Sector-in-2020.pdf>
- 87 IRENA (2017) Climate policy drives shift to renewable energy https://www.irena.org/-/media/Files/IRENA/Agency/Topics/Climate-Change/IRENA_Climate_policy_2017.pdf
- 88 Eurostat Glossary https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Renewable_energy_sources
- 89 Eurostat "Share of energy from renewable sources" https://ec.europa.eu/eurostat/databrowser/view/nrg_ind_ren/default/table?lang=en
- 90 IRENA (2019) "Renewable power generation costs in 2019" https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2020/Jun/IRENA_Power_Generation_Costs_2019.pdf
- 91 Ember and Agora Energiewende (2021) "Europe's Power Sector in 2020" <https://ember-climate.org/wp-content/uploads/2021/01/Report-European-Power-Sector-in-2020.pdf>
- 92 IEA (2018), Renewable Heat Policies
- 93 Raza W., Saula H., Islam S.U., Ayub M., Saleem M., Raza N. (2015) "Renewable energy resources: Current status and barriers in their adaptation for Pakistan." J. Bio-process. Chem. Eng., 3(3):1-9
- 94 Wind Europe (2019) "Wind energy is the cheapest source of electricity generation" <https://windeurope.org/policy/topics/economics/>
- 95 WindEurope (2019) Wind energy is the cheapest source of electricity generation <https://windeurope.org/policy/topics/economics/>
- 96 IRENA (2021) "Renewable Power Generation Costs in 2020, International Renewable Energy Agency" https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2021/Jun/IRENA_Power_Generation_Costs_2020.pdf
- 97 Lisa Ziegler, Elena Gonzalez, Tim Rubert, Ursula Smolka, Julio J. Melero (2018) "Lifetime extension of onshore wind turbines: A review covering Germany, Spain, Denmark, and the UK" Renewable and Sustainable Energy Reviews, Volume 82, Part 1 <https://doi.org/10.1016/j.rser.2017.09.100>.
- 98 Watari et al. (2018) Analysis of Potential for Critical Metal Resource Constraints in the International Energy Agency's Long-Term Low-Carbon Energy Scenarios Minerals 2018, 8(4), 156; <https://doi.org/10.3390/min8040156>
- 99 European Commission 'Bioenergy' https://ec.europa.eu/info/research-and-innovation/research-area/energy-research-and-innovation/bioenergy_en
- 100 WindEurope (2021) "Setting the course towards climate neutrality" <https://windeurope.org/wp-content/uploads/files/policy/position-papers/20210930-WindEurope-Setting-the-course-towards-climate-neutrality-fit-for-55-position-paper.pdf>
- 101 Communication from the Commission (2021) Tackling rising energy prices: a toolbox for action and support COM(2021) 660 final
- 102 COMMUNICATION FROM THE COMMISSION (2021) Tackling rising energy prices: a toolbox for action and support COM(2021) 660 final
- 103 European Commission (2018) "Integration of the Iberian Peninsula into the internal energy market" https://ec.europa.eu/commission/presscorner/detail/en/MEMO_18_4622
- 104 Politico (2018) The Franco-Spanish ghost gas pipeline <https://www.politico.eu/article/the-franco-spanish-ghost-natural-gas-pipeline-midcat-miguel-arias-canete-enagas/>
- 105 International Energy Agency (2020) European Union 2020 Energy Policy Review https://iea.blob.core.windows.net/assets/ec7cc7e5-f638-431b-ab6e-86f62aa5752b/European_Union_2020_Energy_Policy_Review.pdf
- 106 European Commission, DG Energy (2013) The future role and challenges of Energy Storage; European Commission, DG Energy (2017) Energy storage – the role of electricity
- 107 Allison T., Smith R. Natalie, Ma Z. (2021) Chapter 1 - Introduction to energy storage in Thermal, Mechanical, and Hybrid Chemical Energy Storage Systems, Academic Press, p. 1-25
- 108 European Commission, DG Energy (2020) Study on energy storage – Contribution to the security of the electricity supply in Europe
- 109 European Commission, DG Energy (2020) Study on energy storage – Contribution to the security of the electricity supply in Europe
- 110 Communication from the Commission A Clean Planet for all - A European strategic long-term vision for a prosperous, modern, competitive and climate neutral economy COM(2018) 773 final
- 111 JRC (2019) "Converting just 1% of land to renewable energy production can provide EU's electricity consumption" <https://ec.europa.eu/jrc/en/news/converting-just-1-land-renewable-energy-production-can-provide-eus-electricity-consumption>
- 112 Goswami, Sribas. (2015) "Impact of Coal Mining on Environment. European Researcher" 92 https://www.researchgate.net/publication/274195418_Impact_of_Coal_Mining_on_Environment
- 113 European Commission (2019) Clean energy for all Europeans
- 114 Caramizaru, A. and Uihlein, A., (2020) Energy communities: an overview of energy and social innovation, JRC Science for Policy Report file:///C:/Users/ivana.bartolac/Downloads/energy_communities_report_final.pdf
- 115 Roberts J., Bodman F. & Rybski R., (2014) Community Power: Model Legal Frameworks for Citizen-owned Renewable Energy" <https://www.rescoop.eu/uploads/rescoop/downloads/CommunityPower.pdf>
- 116 European Commission (2016) Commission Staff Working Document Impact Assessment Accompanying the document Proposal for a Directive of the European Parliament and of the Council on the promotion of the use of energy from renewable sources (recast) SWD(2016) 418 final
- 117 Van de Ven, D.J., Capellan-Peréz, I., Arto, I. et al. (2021) The potential land requirements and related land use change emissions of solar energy. Sci Rep 11, 2907
- 118 European Commission EU Energy prices https://ec.europa.eu/energy/topics/markets-and-consumers/EU-energy-prices_en
- 119 ACER (2021) ACER's Preliminary Assessment of Europe's high energy prices and the current wholesale electricity market design
- 120 European Commission Communication A hydrogen strategy for a climate-neutral Europe COM(2020) 301 final
- 121 Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on common rules for the internal markets in renewable and natural gases and in hydrogen COM(2021) 803 final 2021/0425(COD); Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the internal markets for renewable and natural gases and for hydrogen (recast) COM(2021) 804 final 2021/0424(COD)

- 122 European Commission Communication A hydrogen strategy for a climate-neutral Europe COM(2020) 301 final
- 123 Regulation (EU) 2020/852 (Taxonomy) on the establishment of a framework to facilitate sustainable investment
- 124 Regulation (EU) 2020/852 (Taxonomy) on the establishment of a framework to facilitate sustainable investment
- 125 European Commission, COMMISSION DELEGATED REGULATION (EU) .../...of 4.6.2021 supplementing Regulation (EU) 2020/852 of the European Parliament and of the Council by establishing the technical screening criteria for determining the conditions under which an economic activity qualifies as contributing substantially to climate change mitigation or climate change adaptation and for determining whether that economic activity causes no significant harm to any of the other environmental objectives
- 126 A Mycle Schneider Consulting Project (2021) The World Nuclear Industry Status report 2021 <https://www.worldnuclearreport.org/IMG/pdf/wnisr2021-lr.pdf>
- 127 S&D Group (2022) S&D comments on draft Taxonomy Complementary Delegated Act https://www.socialistsanddemocrats.eu/sites/default/files/2022-01/taxonomy_complementary_delegated_act_letter_signed_220121.pdf
- 128 EU Platform on Sustainable Finance (2022) Response to the Complementary Delegated Act https://www.euractiv.com/wp-content/uploads/sites/2/2022/01/Platform-draft-CDA-response_embargoed-until-10am-CET-24th-Jan.pdf

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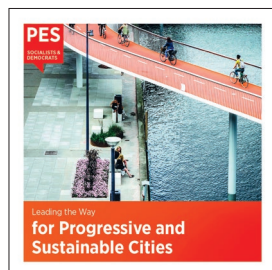
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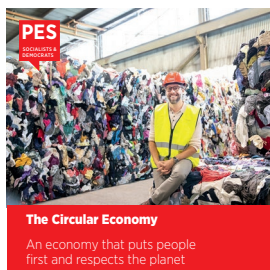
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