EUROPEAN CLIMATE PACT

Peer Parliaments

Make yourself heard

#MyWorldOurPlanet
#EUClimatePact

How we make energy green and fair.
Learning materials for module 2

How we make energy green and fair: production and usage

Question 1

From solar panels on the roof to better insulation in our walls, how we generate and conserve energy in our homes is key to being more sustainable as a society. What would you need to use energy more efficiently and sustainably in your home? **Take a look at the options** hereafter, **chat** about them with your group and **rank them** according to the solutions you think are best.

Points	Option
5 points	B
4 points	C
3 points	A
2 points	E
1 point	D

Ballot sample

A   There should be incentives and clear information on benefits to help me in making **energy-efficient changes** such as insulating my home, installing a smart thermostat, replacing old window frames and using energy-saving lightbulbs.

B   I should be encouraged to **switch to green electricity and heating** for my home by making prices for non-renewable energy higher.

C   Incentives should make it **cheaper and easier** for me to install greener sources of energy in my home, such as solar panels and heat pumps.

D   It should be made impossible to use **energy from dirty sources** such as coal by phasing it out as soon as possible.

E   What **other solutions** can you think of?
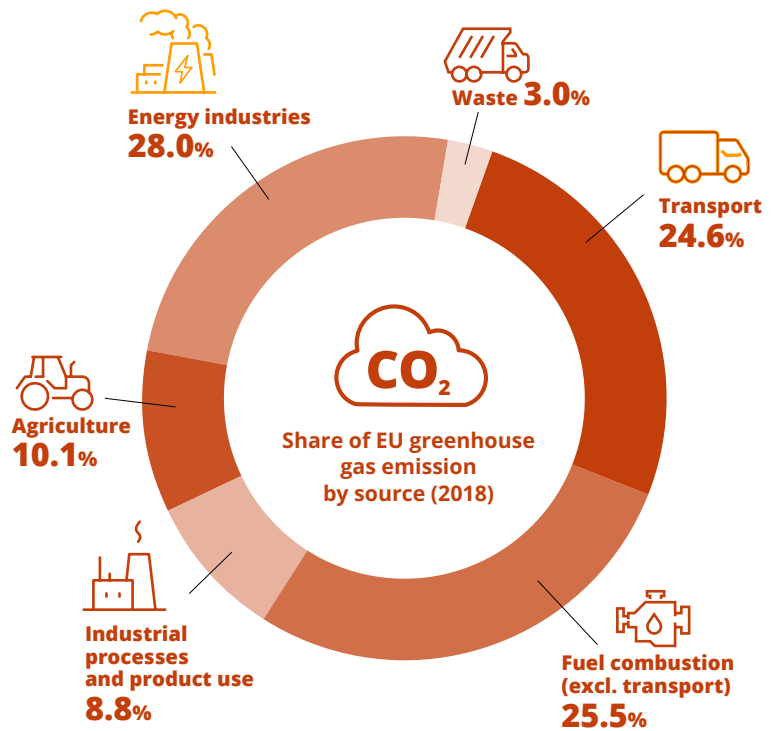
© European Union

Context

Every modern society and economy runs on energy: we need it to generate electricity, heat our homes and power our vehicles. Although most energy is still produced from fossil fuels (oil, coal and gas), a smaller amount comes from renewable energy sources such as sunlight, wind, water and geothermal heat. And that share is growing, slowly but surely.
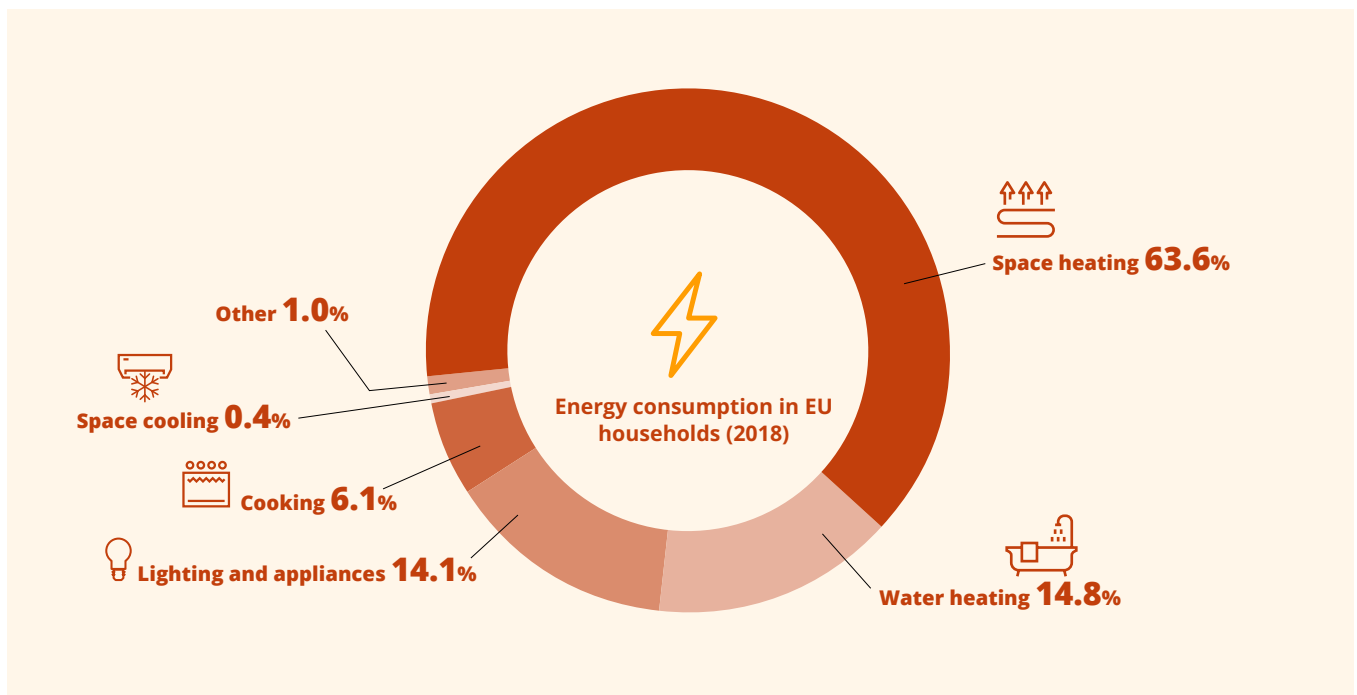
Three quarters of greenhouse gas emissions in the EU come from the generation and consumption of energy.

There are **two ways to reduce energy-related greenhouse gas emissions.**

• By improving energy efficiency and using less energy (for example, by insulating buildings).

• By increasing the share of energy produced from renewable sources. In 2018, households accounted for 26.1% of the energy consumed in the EU, most of which was produced from natural gas (32.1%) and electricity generated from fossil fuels (24.7%), with renewable sources accounting for 19.5%. Heating is the main thing that households use energy for.

Energy industries 28.0%

Waste 3.0%

Transport 24.6%

Agriculture 10.1%

CO_2

Share of EU greenhouse gas emission by source (2018)

Industrial processes and product use 8.8%

Fuel combustion (excl. transport) 25.5%

Producing and using energy more efficiently and sustainably helps to protect the environment, as well as human health and wellbeing. It also slows down climate change and global warming, and reduces the EU's dependency on external oil and gas suppliers. For this reason, the EU's Green Deal aims to bring about a shift away from coal towards cleaner energy sources.

Other 1.0%

Space cooling 0.4%

Cooking 6.1%

Lighting and appliances 14.1%

Energy consumption in EU households (2018)

Space heating 63.6%

Water heating 14.8%

How we make energy green and fair: production and usage

Energy-efficient buildings

Buildings are responsible for about 40% of the EU's total energy consumption and over a third of the EU's greenhouse gas emissions.

Roughly 75% of all buildings in the EU are not energy-efficient and only 1% undergo energy-efficient renovations each year. Around 85–95% of today's buildings will still be in use in 2050.

To cut EU greenhouse gas emissions by at least 55% by 2030, greenhouse gas emissions from buildings will need to be reduced by 60%. Buildings therefore need to be made more energy-efficient, for example through better insulation.

The European Commission's new strategy for boosting building renovation, A Renovation Wave for Europe, aims to double annual energy renovation rates in the next 10 years.

The so-called landlord-tenant dilemma can also sometimes be a problem: landlords don't want to invest too much money in energy-efficient appliances and renovations as they won't see a return on that money, while the tenants paying the energy bills stand to benefit from the savings achieved.

A new wave of investment in energy-efficient building renovation could act as a stimulus for the construction sector, potentially creating 160 000 green jobs by 2030.

Some EU Member States have still not prioritised taking the urgent action needed in the building sector.

**Nearly zero-energy buildings in Europe by building use (residential or not)**
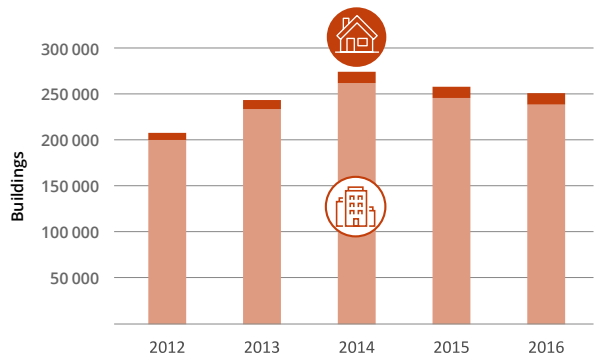
**Nearly zero-energy buildings in Europe (new and renovated)**

Carbon pricing
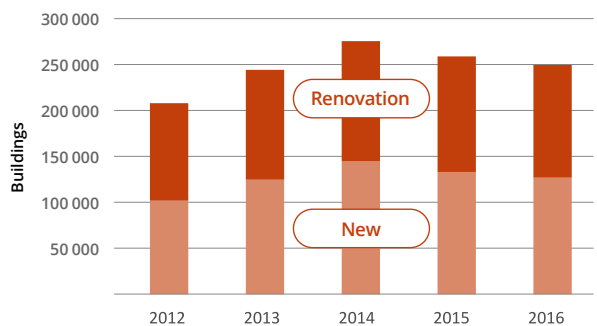
Putting a price on carbon is an attempt to capture the 'external' costs of carbon emissions. These are costs that the public – each and every one of us – pays to repair the damage done by climate change, such as costs for healthcare or material damages resulting from heat waves and droughts.
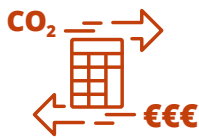
There are different ways to put a price on carbon emissions, but emissions trading systems and carbon taxes are the most common.

Emissions trading means that carbon emitters (such as electricity suppliers) are issued certificates allowing them to emit a certain amount of CO_2 per year. By reducing their CO_2 emissions, they can then sell any unused allowances to other parties in the market that have higher emissions. The total number of certificates is limited and reduced over time by law, so that carbon emitters are incentivised to improve their carbon footprint.

CO_2 223

CO_2 163

CO_2 117
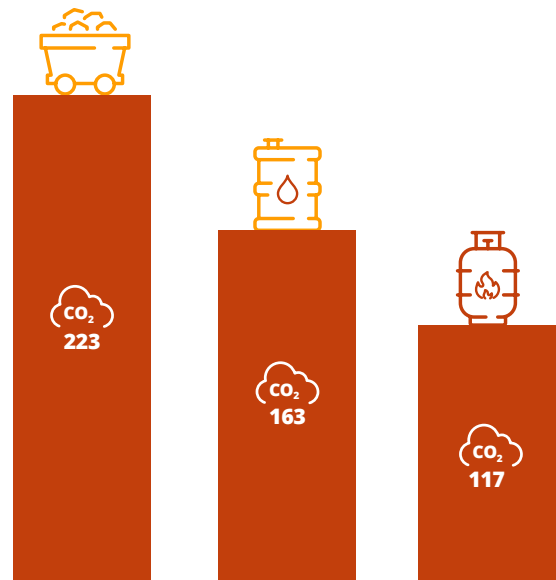
Carbon content of fossil fuels by type - Coil, oil, natural gas (in pounds of CO_2 per million British thermal units)

The EU started an emissions trading system in 2005. It was the world's first major carbon market and is still the largest one. It limits emissions from around 10 000 facilities in the power sector and manufacturing industry, as well as airlines operating between participating countries. Although the system does not yet cover general emissions from transport and buildings, it does cover around 40% of the EU's greenhouse gas emissions.

How we make energy green and fair: production and usage

Carbon pricing

Coal (anthracite)	**228.60**
Coal (lignite)	**216.24**
Coal (subbituminous)	**214.13**
Coal (bituminous)	**205.40**
Diesel fuel and heating oil	**163.45**
Gasoline (without ethanol)	**155.77**
Propane	**138.63**
Natural gas	**116.65**

Pounds of CO_2 emitted per million British thermal units (Btu) of energy for various fuels

Unlike an emissions trading system, a carbon tax directly sets a price on carbon by defining a tax rate on greenhouse gas emissions or – more commonly – on the carbon content of fossil fuels. Carbon content of fossil fuels refers to different amounts of carbon dioxide (CO_2) that different fuels emit in relation to the energy they produce when burned. Hard coal, for example, emits nearly twice as much CO_2 per energy produced when burned as natural gas.

A few European countries, such as Finland, Norway, Sweden and Denmark started experimenting with carbon taxation back in the 1990s. Several other European countries have since followed, but there is huge variation in the tax rates. Carbon taxes can be an effective way to reduce CO_2 emissions and air pollution by putting a price on carbon and can play a role in reducing emissions from sectors that are not covered by the EU's emissions trading system.

The revenue from carbon pricing can be used to support further efforts to cut greenhouse gas emissions. It can also be used to offset the burden on low-income households by increasing welfare benefits, supporting households with lump-sum payments, or investing in special schemes such as subsidies for building renovations.

Solar panels and heat pumps

Solar power is a renewable source of energy that can be used to provide households with electricity and hot water. Solar energy has the potential to meet 20% of the EU's electricity demand by 2040.

For most Member States, solar power provides less than 1% of the energy used for heating and cooling. In countries that have a warmer climate with more sunshine and less demand for heating, solar power provides a much higher share of energy – over 15% in Cyprus, for example.

Heat pumps are another source of efficient energy. Placed outside residential homes, they work like a fridge but in reverse, using energy from the environment to heat or cool a space. Although they do run on electricity, they use it very efficiently.

Heat pumps have become a lot more common in recent years, particularly in Member States where there is a cold climate and fewer homes are connected to the natural gas grid. They are most popular in Sweden, Estonia, Finland and Norway, where more than 25 heat pumps per 1 000 households are sold each year.

To reduce emissions from domestic heating systems, Member States are promoting the installation of heat pumps and solar panels, most commonly through subsidies and loans, but also through tax reductions. This has led to a significant increase in installations in some Member States.

Since 2015, an EU regulation has required heat pumps, solar panels and similar domestic devices for electricity and heat generation to be labelled with information about energy efficiency and consumption. In addition, in 2010, the EU set a requirement for all new buildings to be 'nearly zero-energy buildings' by 2021 and use energy from renewable sources. Around 1.2 Million 'nearly zero-energy buildings' were built or existing buildings renovated to fit the requirements between 2012 and 2016. Their share in the construction market increased from 14 to 20%.
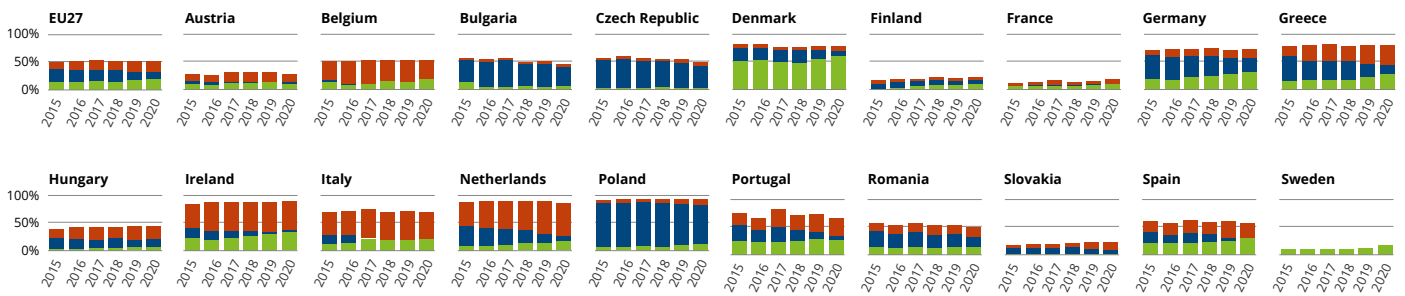
A⁺⁺
A⁺
A
B
C
D
E
F
G
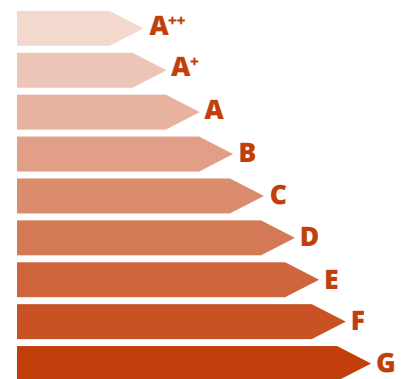
Shifting from coal to other energy sources

Renewable energy sources overtook fossil fuels to become the EU's main source of electricity for the first time in 2020. However, coal is still an important source in some Member States, even though burning coal emits by far the most CO_2 per energy produced when burned – almost twice as much as natural gas and 40% more than diesel and heating oil.
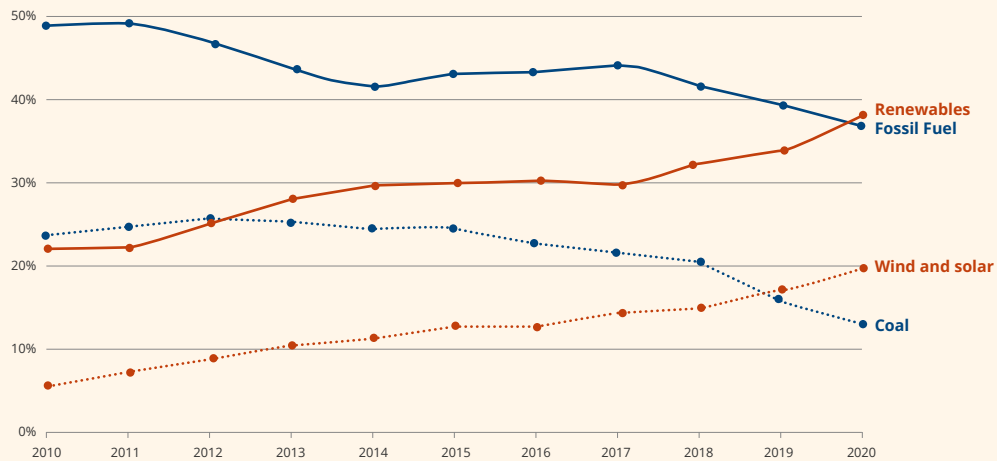
Sources of Electricity Production in EU Member States
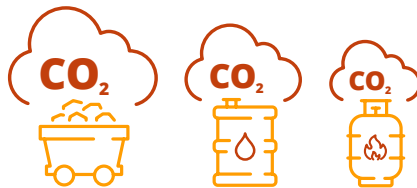
Percentage of total electricity generation   ■ Wind and solar   ■ Coal   ■ Gas

Renewables overtake fossil fuels
% share of electricity production in EU27

Europe's Power Sector in 2020, Ember and Agora Energiewende (25/01/2021)

Shifting from coal to other energy sources

Coal produces more CO$_2$ per kilogram than any other fossil fuel. Although power plants have improved their environmental performance, coal-fired plants are still the main source of pollutants released into the air and water.

Experts say that to reach the European Commission's goal of cutting greenhouse gas emissions by at least 55% by 2030, Member States would need to phase out coal almost entirely.

Of the 27 EU member states European countries that have traditionally used coal to produce their electricity, 14 either are already coal-free or have announced that they will be by 2030. Germany is aiming for 2038, Poland for 2049, Czechia planned coal phase-out for 2033, Slovenia too. Romania committed to phase out coal by 2032 and Bulgaria by 2038.

Phasing out coal is a challenge for the regions affected. The EU's coal sector employs 237 000 people in coal power plants and mines, and this number could drop by 160 000 by 2030, before the sector disappears completely by the early 2040s. The decline could be even faster, depending on how fast coal is phased out across the EU.

The EU has set up the Just Transition Mechanism and Fund to support the EU regions most affected by the shift to climate neutrality – especially coal, peat and oil shale regions. It will do this by helping them to restructure their economies and retrain their workforce in future-proof sectors.

How we make energy green and fair: a just transition

It's crucial that no one is left behind in the switch to cleaner, greener forms of energy. How can we make the transition fair for everyone? **Take a look at the options herafter**, **chat about them** with your group and **rank them** according to the solutions you think are best.

Points	Option
5 points	B
4 points	C
3 points	A
2 points	E
1 point	D

Ballot sample

A Energy-saving technologies such as home appliances and lightbulbs should be made **more affordable** for low-income households.

B Energy and electricity produced from non-renewable sources will **become more expensive** if a cost is introduced for the carbon emitted in the production process (known as a carbon price). These increases should be refunded for low-income households.

C People who work in fossil-fuel or energy-intensive sectors should be offered **opportunities to retrain**, so that they can find a different job in the same sector or in a new sector altogether.

D Communities and regions that depend on coal mining should receive **special help to support their green transition**.

E What **other solutions** can you think of?

Context

With its Green Deal, the EU has set out to drive the transition to green energy and become the first climate-neutral continent by 2050. It is estimated that, overall, the green transition will have a positive impact on economy and employment. With the right policies in place, it could create around 1 million jobs in the EU by 2030 – particularly middle-skilled, middle-paying jobs in construction and manufacturing.

The green transition means transforming the energy sector, which will require massive investments in the short term. The transition costs for electricity alone are estimated to be between EUR 1.2 trillion and EUR 1.4 trillion by 2050. Energy suppliers currently pass on a portion of those energy transition costs to consumers in their energy bills. This increases the risk of energy poverty, which affects up to 34 million people in the EU. Low-income households cannot afford newer, more efficient appliances and often live in older buildings that have not been refurbished, meaning that they pay significantly higher energy bills compared to people living in energy-efficient buildings.

The energy transition puts pressure on parts of the energy sector that are still dependent on fossil fuels, such as coal mining and the mineral oil production (e.g. paraffin). That is why the European Commission is proposing a new Social Climate Fund to support investment in decarbonising buildings and transport, while tackling energy poverty. It will support vulnerable households and small businesses to finance energy renovations, and other measures, to help them reduce their energy consumption and switch to renewables. The fund will make EUR 72.2 billion available between 2025 and 2032.

The EU has established the EUR 19.2 billion Just Transition Fund to help make the green transition fair and inclusive. Member States can use these resources to finance projects, such as training and reskilling programmes, to help people find new employment opportunities in regions that are highly dependent on fossil fuels and greenhouse gas-intensive industries.
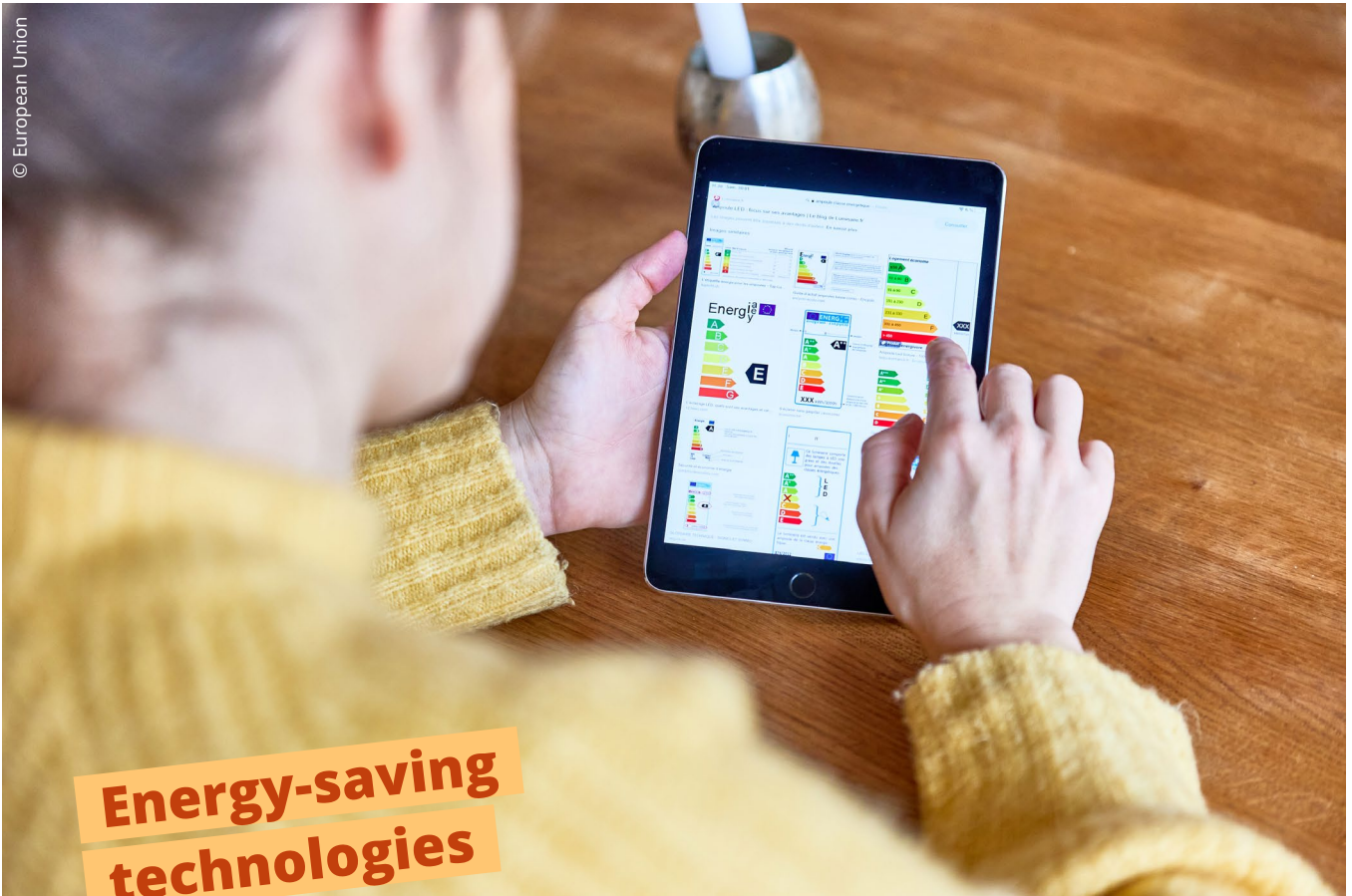
1 million
new green jobs in the EU 2030

72.2 billion
Social Climate Fund 2025 > 2032

19.2 billion
EU estimated Transition Fund

How we make energy green and fair: a just transition

Energy-saving technologies

There are a variety of ways to save energy: from low- and medium-cost solutions such as lightbulbs and home appliances to high-cost, energy-efficient technologies used for retrofitting homes (such as energy-management software solutions).

When shopping for appliances, consumers often have to decide between a standard model and an energy-efficient model, which is typically more expensive but promises reduced operating costs over the appliance's lifetime. The trade-off is between spending less now (with the standard model) and spending less later (with the energy-efficient model). Switching to one of the most energy-efficient electric ovens, for example, can save you up to EUR 230 over 15 years.

Low-income households don't tend to take steps to retrofit their homes with energy-efficient technologies as often as homeowners with a higher income do. Building-renovation programmes could be made more attractive to low-income homeowners by lowering the interest rates on loans, extending the loan repayment period and/or increasing the amount that is subsidised.

Appliance-replacement policies often cover inefficient lighting and old appliances such as washing machines and refrigerators. For example, one German programme gives low-income households a grant of EUR 150 to help them buy a new, energy-efficient refrigerator.

How we make energy green and fair: a just transition

© European Union

Refunding the price of carbon

For the lowest-income EU households, energy bills (including taxes) account for approximately 10% of total household expenditure, ranging from a low of 3% in Sweden to a high of 23% in Slovakia.

The EU's Energy Taxation Directive provides Member States with options for exempting vulnerable households from higher energy taxes.

Energy and electricity will become more expensive if a cost is introduced for the carbon emitted in the production process (known as a carbon price). However, the revenue from carbon pricing can be used to offset the burden on low-income households through welfare benefits and subsidy schemes.

Ireland, for instance, is aiming to redistribute this revenue to protect vulnerable households by increasing their fuel allowance. Portugal intends to redistribute carbon tax revenue in the form of income-tax relief for lower-income families. And when Sweden introduced its carbon tax in 1991, it also reduced energy taxes in general to avoid increases in overall taxation that might have a negative impact on low-income households.

Governments can also use the revenue from carbon pricing to increase expenditure on protecting the environment and to support further efforts to cut greenhouse gas emissions.

How we make energy green and fair: a just transition

Reskilling

There are still 237 000 people in the EU who work in the coal sector, primarily in coal power plants and mines. This number could drop by 160 000 by 2030.

Younger people appear to be more open to upskilling and reskilling initiatives.

The EU's Just Transition Fund will, among other things, help people adapt to a changing labour market by building on their existing skills or learning new ones, as well as helping them find a job.

In addition, the new European Social Fund Plus (ESF+), which has a budget of over EUR 99 billion for 2021–2027, will also invest in reskilling and upskilling to support the transition to a green and digital economy.

Skills mismatch is an obstacle in the transition to a low-carbon energy system. The energy industry has a male-dominated and ageing workforce, especially in conventional energy sectors. There is high demand for science, technology, engineering and mathematics (STEM) graduates, as well as people with digital skills.

How we make energy green and fair: a just transition
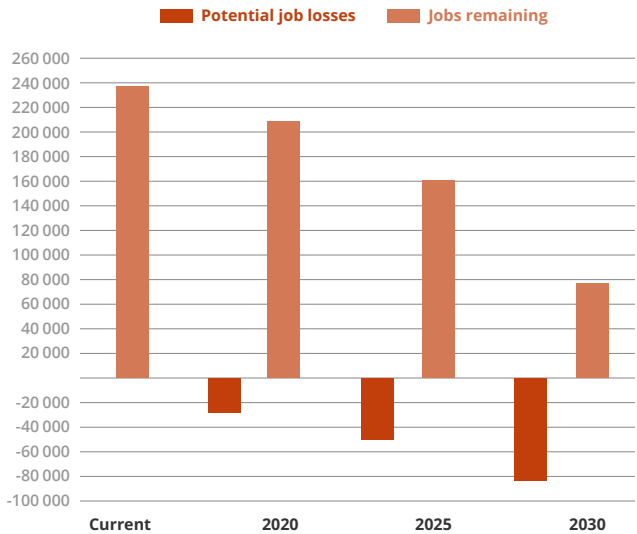
Support for coal regions

There are still 185 000 people in the EU who work in coal mining. Poland employs about half of this coal mining workforce, followed by Germany, Czechia, Romania, Bulgaria, Greece and Spain.

It is estimated that 109 000 mining jobs are at a high risk of being lost as a result of the sector being less competitive. One region in Poland may lose up to 41 000 jobs, which is approximately half of the total number of jobs in that region.

The last coal power station in Germany is scheduled to close in 2038 and, in the run-up to that, the country's coal-dependent states will receive a total of EUR 14 billion to invest in the affected regions. The funds can be used for digitalisation projects, expanding tourism, upgrading urban infrastructure, or innovative climate-action and environmental-protection projects.

Member States whose regions, industries and workers will face the greatest challenges in making the transition to green energy can apply for funding from the EU's Just Transition Fund. Through a dialogue with the European Commission, they will need to define 'territorial just transition plans' that set out the challenges in each region, their development needs and objectives, and the support measures to be introduced by 2030.

Potential job losses   Jobs remaining

	Current	2020	2025	2030

How we make energy green and fair: a just transition

Do you want to share your opinion on future EU climate policies with people from all over Europe?

How would you like to contribute to a climate-neutral Europe? Discuss and get involved!

How you can contribute to a climate-neutral Europe

Go solar
install solar panels to generate energy for your home.

Dial it down
turn down the heating in your home by a degree or more.

Get insulated
install or improve insulation in your home.

Switch your energy
move your home over to a zero-carbon energy supplier.

Want to be kept up to date on the outcomes of Peer Parliaments?

Interested in hosting a Peer Parliament yourself?

climate-pact.europa.eu   EUClimateAction   EUClimateAction   ourplanet_eu   EU Environment and Climate   EUClimateAction

EUROPEAN CLIMATE PACT

#MyWorldOurPlanet
#EUClimatePact