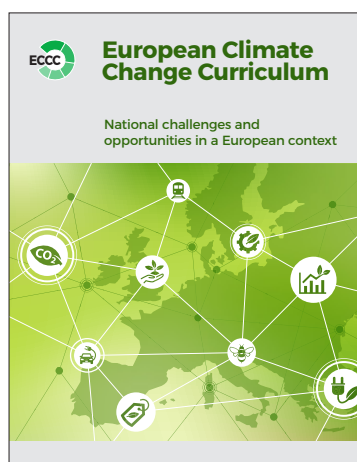




# European Climate Change Curriculum

National challenges and opportunities in a European context





#### Acknowledgements

This e-book and the project website [www.climateperspectives.eu](http://www.climateperspectives.eu) have been created by an Erasmus+ partnership consisting of four secondary schools and five NGOs from Denmark, Serbia, the Netherlands and Spain.

*The participating organisations are:*

- [Bora Stanković Secondary School](#) (Serbia)
- [PROTECTA](#) (Serbia)
- [Roskilde Gymnasium](#) (Denmark)
- [CONCITO](#) (Denmark)
- [Amsterdam International Community School](#) (Netherlands)
- [Natuur en Milieu Overijssel](#) (Netherlands)
- [ECODES](#) (Spain)
- [IES Federico Lorca secondary school](#) (Spain)
- The [Democracy in Europe Organisation](#) – DEO (Denmark).

The partnership is grateful for the support of all the green frontrunners in civil society, business, politics and youth associations who contributed with their time and knowledge to this e-book and our workshops. A very special thanks to all students who participated in the four international workshops in 2021 and 2022 that inspired and informed this e-book.

DEO has edited this e-book and the [website](#), which were both published in 2022.

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# Introduction

## FOR TEACHERS

*This introduction is primarily for teachers and educators. The following chapters are for learners in secondary education aged approximately 15-19 years old.*

Efficient climate action needs to be mindful of national differences and contexts. Ambitious climate plans like the EU's Green Deal can only succeed if citizens and politicians understand the strengths and weaknesses of member- and neighbour states. For example, sweeping political reforms of the energy sector, that got even more relevant after Russia's invasion of Ukraine, should build on the expertise of states with a strong sustainable energy sector and be mindful of states that still largely rely on coal. This is also called 'just transition'; One size does not fit all. Understanding the big picture is key to an efficient, clever, and politically sensitive green transition. That is the central assumption of this e-book.



The partnership behind this book, five NGO's and four secondary schools, wrote five chapters to give readers an intimate insight into the opportunities and challenges of the green transition in Denmark, Serbia, the Netherlands and Spain. This e-book is inspired and informed by our collaboration and four workshops in these countries in 2021 and 2022.

We chose these four countries because they illustrate many of the factors that enable or challenge a sustainable green transition. The chapters zoom in on pressing questions in connection with the green transition. How do we assist countries that have just started their green journey? Which sectors should deliver investments and innovation? What role should the EU play?

### **The Netherlands: An existential threat**

The Netherlands is vulnerable to the effects of climate change. Almost half of the country is situated below sea level and is at risk of flooding from both the North Sea and from the major rivers that flow through the country from the European hinterlands. Without an ingenious system of dykes and sluices, the Netherlands would face an existential threat from climate changes.

Also, the Netherlands is one of the largest hubs in terms of transportation agriculture and trade for the European Union and is striving to make its airports, greenhouses and ports more sustainable. Major gains can be made if the Netherlands succeeds. It can serve as a high-tech laboratory and as a frontrunner for the rest of the world. However, the business-friendly Dutch government has so far been reluctant to take decisive steps to lower GHG emissions, which remains one the highest per capita in Europe. Only during the last few years, and especially because of a civil lawsuit, the country is picking up its green pace. As the chapter shows, the Netherlands is dense with green initiatives and can offer much of the innovation that the world sorely needs.

## Serbia: Shared challenges

Serbia is not yet a member of the European Union, but the country's situation illustrates some of the biggest challenges to the green transition. Their challenges are largely shared by EU members such as Romania, Bulgaria and Poland. One of the biggest obstacles is Serbia's reliance on coal and other fossil fuels to produce energy and heating. A transition away from fossil fuels to more sustainable energy production requires significant financial investments and political will, which currently both are in short supply. Furthermore, Serbia is struggling with other challenges that take focus away from the green transition: Endemic corruption, high rates of youth unemployment and a lack of infrastructure such as central heating. This means that Serbia has a longer and more winding road ahead than more developed European nations.

Despite these challenges, the green transition is sprouting from below in Serbia. The chapter reveals an encouraging plethora of civil society initiatives around the country. As the large-scale demonstrations in 2021 illustrated, the Serbian public gradually focusses more on climate change as it becomes apparent how air quality and farmlands are being affected.



*Presentation on climate impacts on Serbian agriculture*

For years, consecutive Spanish governments attempted to either ignore or do very little to fight climate change. However, just like in the Netherlands, civil lawsuits have pressured politicians to act. As a result, Spain has launched a wide range of policies aimed at combating climate change. Nevertheless, as you will see in the chapter, NGOs are still pushing for broader and more accelerated measures.

## Denmark: A green frontrunner?

The general elections of 2019 were dubbed 'the first climate elections in Denmark'. Indeed, it was the first time in parliamentary history that climate change dominated a general election. For once, typical election-winning topics such as migration and economy got relegated to second place as parties across the political spectrum raced to look the greenest and most climate friendly.

Denmark is widely regarded as a climate frontrunner with a tradition of investing in sustainable energy and nurturing public awareness. In 2020, Denmark adopted the most ambitious climate law on the planet, aiming for a 70% reduction of greenhouse gases by 2030 (compared to the level in 1990). However, being a frontrunner also means being one of the first countries to face the harsh political reality of making those ambitions come true. The Danish government has been criticized of postponing the most efficient measures for too long to avoid estranging important voter segments among the working class.



*Presentation during project workshop in the Serbian city of Niš*

## Spain: Change from below

Should change come from the masses or from the elite? Spain, a country where climate change can potentially have dramatic consequences, is a good example of how public opinion and civil society initiatives can provoke political change. Spain is vulnerable for droughts that can potentially devastate crops. This would not only endanger food supply in Spain but in all of Europe, since the country is one of the largest exporters of fruits and vegetables worldwide.





*Climate workshop in Denmark*

## What role should the EU play?

All in all, these four countries echo some of the basic challenges ahead: How should the EU assist countries in completing their green transition and how can political and civil society visions be transformed into real and viable solutions? And, last but not least: What role does the EU play in accelerating the green transition?

The European Union has faced crises before, but never one that involves such dramatic societal changes as the green transition requires. Reducing greenhouse gas emissions and mitigating climate change is a momentous task that requires support from both civil society as well as the public and private sectors.

The EU and its member states have crucial discussions ahead: Which sectors will contribute the most? How to differentiate between more wealthy member states who have emitted a lot of greenhouse gasses historically and new member states that need to catch up economically and emit more in the meanwhile?

To which extent can the public at large be involved in this process? Can a new Brussels Effect be created through carbon taxes? The last chapter will discuss these questions and explain what the EU is doing – and aims to do in the future.

## How to use this e-book and project website

There is no consensus on how to best teach climate change and the green transition across Europe (or the world for that matter). Education on climate change typically focuses on causes and solutions but rarely on

the political process and how to establish international consensus on how to get there. It is easy enough to identify what needs to be done, but much more difficult to identify and overcome the political, economic, environmental, international and societal obstacles on the road to a green transition that is both efficient and does justice to all members of the European Union.

This book aims to answer these needs with an approach that focuses on individual countries before focusing on the European level. We understand that very few teachers will have the opportunity to go through the entire book with their students. That's why we have designed the book, so you can pick out the country chapters – and sections – that you find relevant for your class. The final chapter on the EU can also easily be used independently to focus on the Green Deal and other initiatives.

This e-book makes extensive use of links to external sites and resources. Furthermore, the portraits of climate stakeholders will link to videos of these interviews on our website [www.climateperspectives.eu](http://www.climateperspectives.eu)

In order to activate learners, each section of each chapter will finish with a link to questions and exercises on the project website. We have allowed each participating country to shape these questions and exercises in a way that reflects their pedagogical and didactical traditions, which means the reader will experience some divergence across the chapters. We suggest that you, the teachers, go through these exercises beforehand to judge which ones are suitable for your learners.

We hope that the e-book will contribute positively to your lessons about climate change and the green transition. Please share your feedback and comments: [undervisning@deo.dk](mailto:undervisning@deo.dk)

*Copenhagen, March 2022*



*The partnership behind the European Climate Change Curriculum*

# Introduction

## DENMARK

On the second of July 2011, a thunderstorm hit Denmark after a long period of hot summer weather. During a period of two hours some areas experienced more than 150 mm of rain. The infrastructure in greater Copenhagen failed in controlling the large amount of rain water, causing sewers to overflow, while basements all over the city were quickly flooded.

Moving around in Copenhagen that day could be a chaotic experience. Cars were driving around trying to find dry spots for parking before the rising water would flood their cabins as well. Even as a pedestrian you would have to watch out. The heating system from Copenhagen Energy had collapsed which caused water to boil and steam up through the sewers in the sidewalks. Nine unfortunate citizens were reported to have suffered burn injuries. You also had to stay away from the floods due to longer term risks. In the aftermath of the flood people got hospitalized because of infections from dirty water from the sewers.

Leaving the city by public transport would not be easy either. The train traffic was totally disrupted as the rain masses flooded train tracks and damaged the technical installations. At the same time there was no traffic information due to IT breakdown caused by a fire incident at the railway headquarter. In case you needed to call the police you could have difficulties reaching the relevant staff as well. The telephone system was out of order for two days due to a flood in the basement of Copenhagen Police Station. Even if you decided to just stay indoors you might not be able to get information from television due to power failure around the city.

Today, the event of 2011 is considered one of the most severe cloudburst incidents that Denmark has experienced in terms of rain and economic damage. The insurance cost of this particular cloudburst was estimated to be 650-700 million euro, which had to be paid by the city authorities and citizens. Furthermore, a lot of investments have been put into preventive measures regarding future cloudbursts.



*Photo of a flooded street in Copenhagen, 2/6 2011.  
Credit: Lisa Risager*



## Climate change in Denmark

Like many other countries around the world, Denmark has experienced more extreme weather in recent years, as a consequence of climate change. According to climate data from the period 1991-2020, the Danish climate has changed noticeably over the past 30 years. On average, the temperature has increased by one degree celsius in Denmark and it rains 47 mm more per year compared to the period 1961-1990. The warmer temperatures cause more water vapor in the atmosphere which can result in extreme rain events during the summer. Therefore, the prediction is that Denmark will experience warmer and more wet weather in the future.

### THE MOST IMPORTANT EXPECTED CLIMATIC CHANGES IN DENMARK:

1. **Milder winters** with approximately 25% more rain.
2. **Warmer summers** with drier periods, but also more risk of cloud bursts.
3. **Temperature will increase.** Since the 1870's the temperature in Denmark has increased by 1.5 degree celsius. If we continue with business as usual, it is expected that the temperature in Denmark will increase by 2.9 to 4.4 degrees celsius in 2100.
4. **Sea level rise.** It is expected that Denmark will experience a general rise in sea levels around the coast.
5. **Rising water levels** will cause **storm surges and severe floods**, if Denmark does not succeed in implementing sufficient climate adaptation initiatives.
6. **Stronger winds** and more **frequent storms**.

## Strong adaptability

As described above, the expected climate change in Denmark will have various kinds of impacts on citizens' lives. Especially, Danish infrastructure (cities, buildings and the transport sector) is likely to be affected by climate change. Since Denmark is a low-lying country, it is expected to be negatively affected by sea level rise. In addition, Denmark has a long coastline which makes it very expensive to take the necessary climate adaptation initiatives.

Almost 60% of Denmark's total area is used for agriculture. Since Denmark has a relatively strong adaptability, a warmer climate will most likely not have a negative impact on the national food production though. The climate conditions for fruit and vegetable production might even improve in Denmark, because the warmer weather will allow for producing more types of crops and extend the growing seasons. However, a warmer climate can also cause an increase in pests as well as plant and livestock diseases. This could give rise to more frequent use of pesticides on agricultural land. In turn, this could have consequences for the groundwater and biodiversity.

Denmark is relatively resilient though, and in general climate change will most likely not hit hard here, compared to many other areas of the globe. However, Denmark is a small country with an open economy, and therefore very dependent on other countries and the global market. This means that climate change harms felt, for example, in the global south, can severely impact the Danish trade and economy indirectly.



A typical Danish landscape: an agricultural field close to the sea. Credit: [Stig Nygaard](#)

## Climate action in Denmark

Denmark as a civil society has a tradition of engaging in the environment and related politics. In 1973, the Danish government agreed on an environmental law. Due to the global oil crisis starting the same year, the first official energy plan “Danish Energy Policy” was passed in 1976. One of the objectives was to introduce nuclear power during the period 1985-1999.

This policy gave rise to the establishment of several strong environmental non-governmental organizations and a political mobilization that resulted in Denmark giving up the establishment of nuclear power plants in 1985.



*“Nuclear Power - No Thanks”  
- A Danish version of a sticker  
from the international  
campaign against nuclear  
power which became popular  
in the 70’s and 80’s protests.  
Credit: [Anne Lund](#)  
- [The OOA Foundation](#)*

In 1987, the report “Our Common Future”, from the The World Commission On Environment And Development (WCED) put sustainable development on the political agenda in the international society. In Denmark, this inspired an important goal in the third official Danish energy plan of action from 1990, entitled “Energy 2000”. In 2005 Denmark would have to reduce the CO<sub>2</sub>-emission by 20% compared to 1988.

In the 1990s Danish politicians were active in international negotiations that led to the UN Kyoto Protocol 1997 with binding goals aiming at reducing CO<sub>2</sub>-emis-



*Political leaders at the COP15 in Copenhagen, 2009.  
Credit: [The White House \(Pete Souza\)](#)*

sions in the developed countries by 5.2% in 2008-2012 compared to 1990. The goal for the EU was 8% and for Denmark 21%.

During the years, Denmark had several ambitious Ministers of Environment who pushed forward offensive politics for sustainable growth, green energy and environmental policy. This was also seen during the international climate negotiations, where Denmark had the leadership and hosted COP-15 in Copenhagen in 2009. The result of COP-15 was disappointing to many countries though, as no binding climate agreement was made.

However, it included the long-term goal of limiting the maximum global average temperature increase to no more than 2°C above pre-industrial levels.



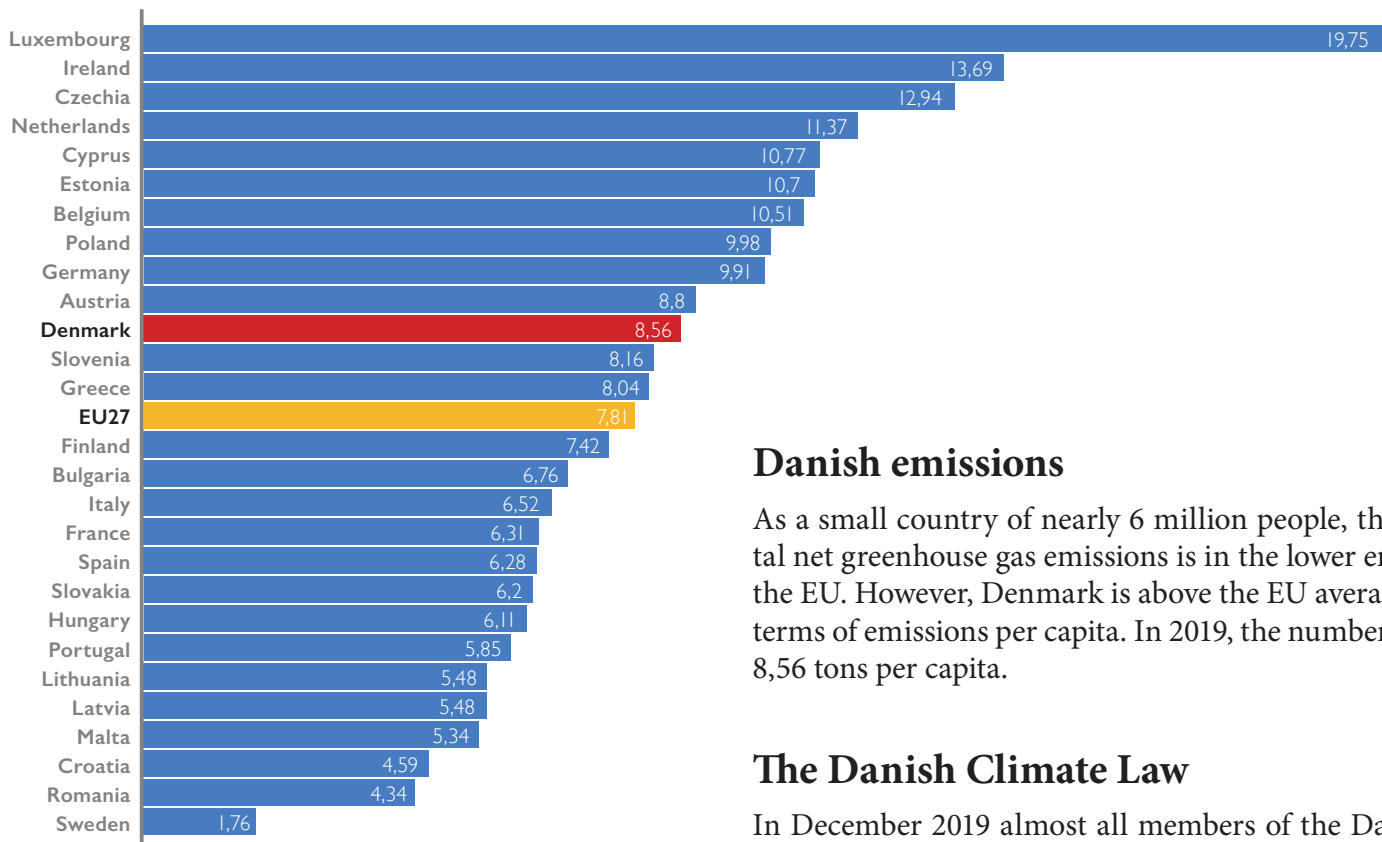
*Climate demonstration in front of the Danish Parliament in 2019.  
Credit: [Jonas Drotner Mouritsen](#)*

The financial crisis from 2007/08 left the environmental agenda a less prioritized theme in Danish politics. From 2010-2020 Denmark has had different governments with changing focus on the environmental and climate agenda. In 2012 the Danish Parliament passed “The Energy Agreement” to reduce CO<sub>2</sub>-emissions by 34% in 2020 compared to 1990.

With the growing awareness on sustainability amongst the international society, the global climate mobilization in 2018 dominated the political debate in Denmark. Therefore, the climate agenda played a huge role in the Danish parliamentary elections in 2019, sometimes referred to as “the climate elections”. The elections caused the new government to agree on a climate law including several ambitious climate goals and targets (read more in National Initiatives).



## Total net emissions per capita - All greenhouse gases - (CO2 equivalent) with international aviation (2019)



## Danish emissions

As a small country of nearly 6 million people, the total net greenhouse gas emissions is in the lower end of the EU. However, Denmark is above the EU average in terms of emissions per capita. In 2019, the number was 8,56 tons per capita.

## The Danish Climate Law

In December 2019 almost all members of the Danish parliament agreed on a Danish climate law. The law is binding and shall ensure that Denmark's greenhouse emissions are reduced by 70% in 2030 compared to 1990 emissions. This means that Denmark needs to reduce emissions with 20 mio. tons of CO2 in 2030. Furthermore, the aim of the law is that Denmark will reach climate neutrality with net zero greenhouse gas emissions in 2050. Overall, the Danish climate law provides the frames for securing that the country will work actively to meet the goals of the Paris agreement, and keep the global temperature rise within 1.5 degree Celsius.

The Danish climate law is the first of its kind, creating a binding agreement among the majority of parties in the Danish parliament. This broad agreement among the parties, forces future governments to include climate in their policies, independent of their political position.

## Political debate on climate change

Danish politicians generally agree that it is important for Denmark to act on the climate crisis. However, like in many other countries there are disagreements on how to do this in the best manner. Some politicians ar-



Vi har en aftale!! #klimalov



10.17 PM - 6. dec. 2019 - Twitter for iPhone

*"We have a deal!! #climatelaw".*

*The Danish Climate Minister and representatives from parliament parties after agreeing on the first Danish climate law in December 2019.*

*Screenshot from Twitter.*

gue that Denmark should introduce carbon taxes for companies that emit a lot of CO<sub>2</sub> and on GHG heavy products such as meat or flight tickets. Others disagree as this would damage the competitiveness of Denmark compared to countries without similar legislation. Furthermore, the higher prices on consumer goods will mainly hit people with lower income. This itself could lead to public resistance against climate legislation as seen elsewhere in the world.

Denmark has strong agricultural lobbyists, making the sector a heavily debated subject amongst Danish politicians. Green organizations argue that the agricultural industry, especially the livestock production, should be downsized substantially and more land should be used for plant based production. Contrarily, the Danish association for agriculture and food production argues that the strong agricultural tradition in Denmark should be maintained. Moreover, Denmark should set a positive example through development of sustainable solutions which can inspire the sector in other parts of the world.

## Criticism from independent council

Despite the high ambitions, the Danish Council on Climate Change (DCCC) has criticised the current climate strategy for being too unspecific. In the latest annual report from February 2022, the council states that there is a need for more concrete plans of how and where the reductions of emission shall come from. Too much of the climate plan rests on uncertain technologies and should instead include well known tools such as the establishment of more wind and solar technology.

The council came to a similar conclusion in 2021, but a year later the strategies were still not enough in order to reach the 70% reduction-goal by 2030. The council did however acknowledge the government for strengthening the analysis of potential climate measures and supporting initiatives such as Danish hydrogen production.

The Danish government has presented ambitions to take more active steps for climate action. In her recent New Year's speech (2021/2022), the Danish prime minister Mette Frederiksen mentioned implementing measures such as a carbon taxing system and fees on domestic flights. With these new ambitions, the prime minister sets a political direction which is to some extent in accordance with recommendations from green organisations.



## The need for consumption changes

In the Eurobarometer survey from Spring 2021, 76% of the Danish respondents think that climate change is a 'very serious' problem. In general, there is also a strong public support for political action and to act more climate-friendly in people's everyday lives. Moreover, the majority of people agree that a green transition of Danish production- and consumption patterns is required in order to secure growth and general welfare.

In spite of Danish citizens' general concern for climate change, their consumption patterns and lifestyle contribute greatly to the emission of greenhouse gasses. People in Denmark have a very high carbon footprint per capita. This is generally due to Denmark being a wealthy country with relatively high wages and living standards. Danish citizens have a high level of consumption of goods such as electronics, clothing, holidays with planes and meat.

It can be debated whether or not individuals have a personal responsibility to reduce emissions or whether the responsibility for climate action solely lies within the political system and the industry. However, it is clear that the green transition also is dependent on some form of changes in individual people's lifestyle. In the following section you can read about four people working to make positive changes to reduce harmful effects on the climate.

[Click here for questions and exercises about this section](#)

# PORTTRAITS

In this section you can read about Danish people who are engaged in fighting climate change in different ways. You can also watch the full interviews with English subtitles by clicking on the photos.



## **Connie Hedegaard: The way we live has to change**

Connie Hedegaard is former climate minister in Denmark appointed by The Conservative People's Party. In 2010 she became the first European Commissioner for Climate Action in the EU. Today, she is part of green think tanks such as Concito and a board member of several foundations and companies.

According to Connie Hedegaard, there is both strong public and political support for the green transition in Denmark. »Compared to before we are not discussing whether there is a climate problem. People know it is for real. The awareness is there - and not just among young people«.

However, Connie believes there is still a lot to discuss in creating a greener society in Denmark. »Decisions are getting closer to people's lives, and that is where it gets tricky. The way we live our lives has to change as part of the green transition.«

What is needed is politicians who dare to stand up to the promises they have made, she thinks. »I believe that the public support for this agenda is strong enough to help policymakers and decision-makers dare do what is needed.«

## **Clara Laurine Berg-Jensen: The problem is here right now**

Clara is a 25 years old student and has been engaged in the climate agenda for the past ten years. Clara is active in the Danish Green Student Movement. The focus is taking the responsibility of the crisis away from the individual, and giving it to the government. In this way the society can be regulated towards a more sustainable society.

Clara grew up in a small town, called Vejle. She has experienced a big change in the awareness of the climate crisis amongst people in Denmark.

»When I became a vegan ten years ago, nobody spoke about the climate crisis, and it was really awkward to be a vegan in my hometown. Today it is normal to be vegetarian and vegan, and both young, adult and old people are engaged in the climate crisis,« she says.

Clara is critical towards the Danish government and how they are planning to reach the goals of the Climate Law. Clara is still waiting to see political action, as the government so far has postponed many actions until 2029.

»This is not ambitious enough, as we will still emit a lot of CO2 until 2030. The climate doesn't care about the fact that we have made a deal to stop emissions in the future. The problem is here right now«.







## Ida Auken: It's becoming a broader topic

Ida has been a member of the parliament for the past 14 years. She is the former Minister of the Environment (2011-2014). Ida was also part of the negotiations for the Danish Climate Law in 2019. Her engagement in the climate began at the age of 20 when she realized the effects of climate change in the future.

»It was a shock for me that people were living their lives like nothing was happening with the environment, when science was telling us that we were jeopardizing our survival, stability, the planet, nature - all things that I find beautiful and wonderful«.

As a result she got engaged in politics and has been involved in environmental and climate debates ever since.

Ida believes that the youth has been a very important factor in driving forward the climate agenda in Denmark and around Europe.

Young people have a special "we can change the world mentality" which is vital when pushing for change, she says.

However, Ida has also observed that middle aged and older people have changed their mindsets and are implementing new more climate friendly habits. The climate urgency is becoming a broader topic among the public, which is very important in the green transition, she says.

## Lasse Antoni Carlsen: Mushrooms instead of meat

Lasse is the founder of Bygaard, where he produces organic mushrooms in the middle of Copenhagen. This has brought agricultural production close to where most Danes live: urban areas. Thereby, some production chain middlemen are avoided, which makes the small scale farm profitable. Moreover, it provides people with a protein-rich alternative to meat: Locally grown organic mushrooms.



Over the last decade, Lasse has personally felt how views on the green transition have changed. Not least when he represented his ideas at Roskilde University where he studied the field of environment and innovation.

»When I first started working on urban farming at my university, my professors and the local politicians didn't understand why food production should be brought into the city«.

Since then, Lasse has observed a drastic change in people's behavior, values, and ideas surrounding food, with more Danish consumers appreciating organic and locally sourced foods.

»No matter their political orientation, most Danes think the environmental and climate issue is the most present topic».

Lasse has noted that, although the change in behavior is especially present within the younger age group, all age groups find mushrooms to be a good meat substitute.

[Click here for questions  
and exercises about this section](#)



# NATIONAL INITIATIVES

As you have learned in the previous sections, Denmark has a long history of civil engagement in the environmental agenda. However, as in many other parts of the world, the awareness of the general Danish public on climate change has increased drastically over the last decade. Various different climate movements and organizations have been formed, and more and more people demand climate action at the political level. In this section, we will take a look at some of the major sustainable and green initiatives in Denmark.

## The Danish windmill adventure

Denmark is internationally recognized for playing a key role in the spread of windmills as a renewable energy resource. In the 1970's, there was an energy crisis in the Western countries which caused countries to look

into other energy sources than oil. In Denmark, there was a big resistance towards nuclear power and there was a growing interest for renewable energy across the country. Danish scientists and companies established small scale test facilities for windmills. In addition, the Danish government made subsidy schemes that gave economic support to windmill production companies. This made the windmill industry in Denmark increase. In the beginning of the 1980's other countries gained interest in windmills and since Denmark was leading within the field, the export of Danish windmills increased a lot. The Danish windmill industry has developed into a big and important industry in Denmark. This is the result of Danish political, financial, and public support. Today, Danish windmills are known as the best and most competitive.



*Danish windmills close to the capital of Copenhagen.*  
*Credit: CGP Grey*



*Climate march in Copenhagen, May 2019.  
Credit: Jonas Drotner Mouritsen*

## Citizens' initiatives

One of the big shifts in Denmark has been how civil movements concerning climate change have increased. One example is the organizing of “Folkets Klimamarch” (the People’s Climate March), a form of demonstration, where the focus is on calling out to the members of the parliament, demanding more serious climate action. In 2017, the first march was held as part of a global demonstration arranged by People’s Climate Movement. The following years, public support for the climate march increased. In 2019, more than 40.000 Danes marched the streets in order to ensure a focus on climate in the subsequent governmental elections. This resulted in a prevalent focus on debating climate during the election campaign. Subsequently, these elections were referred to as “the climate elections”, and the new government has now taken up the task of forming ambitious climate policies for Denmark.

## The Danish Council on Climate Change

As a result of the Danish climate law, an independent advising organ named the Danish Council on Climate Change (DCCC) was created. The council consists of some of Denmark’s best climate scientists. The purpose

of the DCCC is to advise the Danish government on which regulations and incentives are necessary, in order to reach the goals of the Climate law. Moreover, the council comments on the status of Denmark’s emissions, evaluates whether the incentives taken by the government are sufficient, and contributes to the public debate on climate. The Climate Council is an advisory organ, thereby they do not have political power to make decisions. They can however express criticism towards the government’s plans and politics within the climate area. DCCC has already proposed several concrete instruments that can help in reaching the 70% reduction goal in 2030. This includes a significant carbon tax on all Danish greenhouse gas emissions.

## The Youth Climate Council

In parallel with the establishment of the Climate Council, a corresponding council has been set up, which takes into account the interests and views of young people. The Youth Climate Council has a similar purpose as the Climate Council: bringing new thoughts and inputs to the Danish climate ministry - with a special focus on ensuring that young people’s voices, viewpoints, and innovative ideas are heard and included in the negotiations on the climate strategies.





*Members of the Youth Climate Council (2022).*

Everyone between the age of 18 to 29 years can send an application to the council and the selected members are then involved for a two-year period. They come from different regions of Denmark and have different educational backgrounds, bringing different views on the challenges concerning climate change.

The Youth Climate Council has so far provided a range of inputs and comments to Denmark's climate politics. For example, they have made advice regarding education, behavior, agriculture and more wild nature in Denmark.

## **Danish municipalities**

Denmark is divided into 98 municipalities. Much policy, which has a direct impact on citizens' lives, is adopted locally in the municipality councils. This includes planning how waste should be sorted in households, managing biking paths, or deciding on the amount of organic food in the local school canteens. By adopting progressive legislations and taking local action, municipalities can also set a direction for both national and international politics. In Denmark, this is currently the case when it comes to climate, as the next section elaborates on.

In 2020-2021, a total of 94 of the Danish municipalities signed up for the project *DK2020*. In this project, the municipalities pledge to develop and implement a climate action plan, which meets the targets of the Paris Agreement. The plan should take into account both mitigation and adaptation measures. In practice, this means that municipalities, which have signed up for *DK2020*, are striving to be completely resilient and climate neutral by 2050.



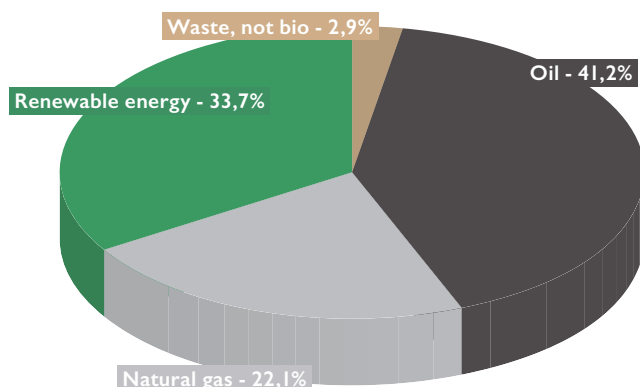
*Translation: "DK2020 climate plans for all of Denmark".  
Photo: Claus Bjørn Larsen, edited by CONCITO.*

[Click here for questions and exercises about this section](#)

# DANISH ENERGY MIX

The Danish Government has set the goal that Denmark has to become independent of fossil fuels by 2050. The development in the amount of renewable energy production has been increasing since the 1990s whereas the amount of fossil fuels used for energy production has decreased. In 2019, the amount of renewable energy production in Denmark counted 33,7% out of the total energy production.

Main energy sources in Denmark



## Denmark's energy production today

Today, primary energy is produced using a mix of fossil fuels (oil and gas) and renewable energy sources (wind, solar power and biomass) as well as waste-to-energy. The energy is used to produce electricity and district heating for residences and houses as well as the industrial and transportation sector.

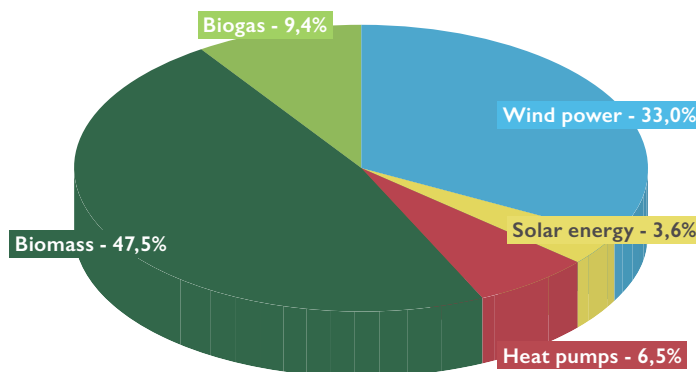
Denmark has produced oil and natural gas since 1972 in the Danish part of the North Sea. Moreover, Denmark has been exporting oil and gas since 1997, but forecasts show that this trend will stop during the 2020s.

## Renewable energy

The renewable energy production in Denmark is mostly based on wind power (33%) and biomass (47,5%). Moreover, heat pumps (6,5%), solar energy (3,6%) and biogas (9,4%) are utilized to produce energy.

**Wind power (33%).** In Denmark, there are more than 4000 onshore wind turbines and 500 offshore wind

Renewable energy production in Denmark



turbines spread across different ocean wind farms. However, some of the onshore wind turbines have outdated technology. According to the Danish Energy Agreement from 2018, three new offshore wind farms will be established before 2030. The goal is for the wind farms to gain a capacity of 2400 MW, which will be enough to cover the energy use in all Danish private households.

**Solar energy (3,6%).** In Denmark, solar power is used in two different ways: Solar panels and solar cells. Solar panels are used to heat up buildings and produce district heating, and solar cells are used to produce electricity. Solar energy is an integrated part of the Danish district heating system and more than 40 large-scale plants around Denmark produce hot water from the sun's energy. In 2017, solar heating covered 2% of the Danish district heating production, but the technology could potentially contribute up to 10% by 2030.

**Heat pumps (6,5%).** Heat pumps use the energy from the surrounding environment to produce energy. It uses electricity to move available heat from one place to another. In a property, a heat pump takes the available heat from the ground or air and increases it to a more useful temperature for utilization in the home. In district heating plants, large heat pumps create higher levels of renewable energy to be used for heating purposes, while assisting in balancing the energy system.



**Biogas (9,4%).** Biogas accounts for 9,4% of the renewable energy production in Denmark. It is produced by anaerobic digestion of organic material such as manure, sewage sludge and other organic waste types from industries and households. Biogas can be used for both heating and electricity and a by-product from biogas production is natural fertilizer. Currently, around 20% of the gas in Danish gas pipes is biogas (rather than natural gas) which makes Denmark one of the leading countries in the world in relation to biogas.

**Biomass (47,7%).** The use of biomass for energy production has increased in the last two decades. Initially, the use of solid biomass such as straw, biodegradable waste and fuel wood was most common in the production. Since 2010, the most dominant type of biomass for energy production has been wood pellets. However, this is not reflected in the figure below where Danish wood pellets only account for 2,4%. In reality, Denmark imports a large share of their biomass, especially wood pellets. In 2018, Denmark had to import 37% of the total amount of biomass used to produce energy and this number has risen since then.

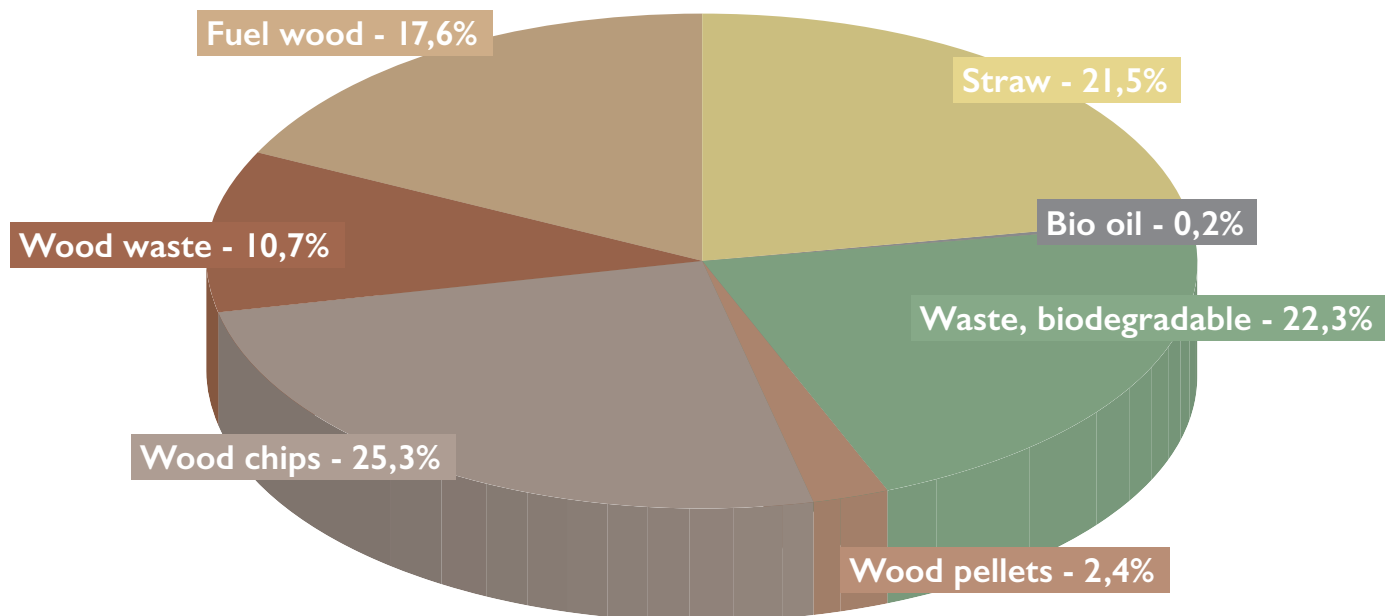


Wood pellets from India. Credit: [Kapilbutani](#)

The real climate effect of biomass for energy is currently debated in Denmark. In practice much of the biomass used would have stored carbon if left in the forests or fields. Instead, more carbon is released when burning wood or straw.

[Click here for questions and exercises about this section](#)

## Biomass for energy production in Denmark 2019



## LOCAL INITIATIVES

Climate change can easily seem like an overwhelming and large-scale problem, detached from our everyday lives and our individual ability to make a difference. But there are many different ways in which individual people and communities can make sustainable, local projects that are down-to-earth and fun and meaningful as well. In this section, we present some examples of projects and initiatives, where sustainable and climate action is taken locally in Denmark.

### GRO SELV (Make It Grow)

GRO SELV (Make It Grow) is a nation-wide youth community, which supports young people in setting up sustainability projects in their local area. The projects range from arranging DIY-workshops or mushroom collecting tours in the local forest, to facilitating climate-friendly community dinners or long-distance biking tours. The different projects made by the GRO SELV community over the years, have been assembled in an [online collection](#) (in Danish).

GRO SELV also arranges the small and intimate annual festival, MAINDREAM, which brings young people together for a couple of days of inspiration, projects and networking. The participants experiment with small-scale sustainability initiatives and share perspectives towards a more sustainable way of living.

On page xx, you can see an example of a DIY-guide made by GRO SELV.



*GRO SELV community on a trip in nature.*

*Photo credit: GRO SELV*



*Freshly harvested mussels in Copenhagen.*

*Credit: Eva Helbæk Tram*

### Havhøst (Sea Harvest)

Denmark is surrounded by the Sea. Apart from being beautiful to look at, the Sea is perfectly suitable for growing climate friendly food, for example seaweed, mussels, or oysters. By growing food underwater, more agricultural fields on land could over time be turned back into forests - which are much better for the climate and for biodiversity.

The “crops” grown in the Sea are actually experts in taking up CO<sub>2</sub>. In fact, one kilo of mussels only emit 0,22 kilo of CO<sub>2</sub>, whereas one kilo of tenderloin beef emits 151,95 kilo of CO<sub>2</sub>.

The organization Havhøst is a cooperation of local maritime gardens, producing various kinds of underwater crops at a small scale. The gardens are spread out across Denmark, and are typically managed and harvested by volunteers. Each year, more and more new gardens are established which provide food for the people involved in the management. Many gardens also act as a site for education and information to the local schools and communities. The goal is to invite people to be engaged in a sustainable management of the ocean, also called the blue economy.





*Food distribution at a local branch of Stop Spild Lokalt.*

## Food waste initiatives

Each day, a large amount of perfectly fine food is thrown out in households, restaurants and supermarkets, due to an exceeded expiration date. This problem has led a number of Danish civilians to take action through different food waste initiatives.

In 2016, the then 17-year old Rasmus Erichsen created a Facebook group, where people could make arrangements to share leftover food with each other in his hometown Korsør. The group quickly reached great popularity and suddenly Rasmus found himself on front pages of local and national news media.

Today, Rasmus is the chairman of Stop Spild Lokalt (Stop Waste Locally). It collaborates with organizations, businesses, and other food waste initiatives, both nationally and globally. Other Danish initiatives fighting food waste are the app, Too Good to Go, the communities Fødevarebanken and Stop Spild af Mad, and the chain of stores with surplus food, Wefood.



*Urban garden project at a Danish music festival. Credit: TagTomat*

## TagTomat (RooftopTomato)

The organization TagTomat ("RooftopTomato") was founded in 2011, when Copenhagen-based Mads Boserup Lauritsen decided to start growing tomatoes

on the roof of a shed in his backyard. He invited his neighbours to join in, and all of a sudden, tomatoes and other types of greens were popping up in the urban backyard.

Since then, the phenomena of setting up gardens in small urban areas has spread widely around Denmark. The organization now provides the frames for local urban farming communities and projects to grow by sharing experiences and knowledge in an open source manner. This includes selling seeds and remedies for planting, hosting workshops, giving talks, and providing educational materials for children and young people.



*Fresh hops from Byhumle on the way to a brewery.*

## Byhumle

Hops are an important part of beer production! However, breweries in Denmark usually import all their hops. Some come from other European countries while a lot is imported from the USA or even as far away as Australia and New Zealand. Hop growing is actually perfect for urban areas. They require a lot of vertical space as they can get as high as 6 metres. At the same time they do not need much space on the ground. Byhumle (City Hops) is a non-profit organisation growing local hops in Denmark. It started as a small project to make the city of Copenhagen a little greener and at the same time help local craft breweries and home brewers experiment with fresh-hopped beers. Today, Byhumle has close to 400 plants and 16 different varieties. They also provide seedlings for people who want to grow their own hops.

[Click here for questions and exercises about this section](#)

## ROLE OF THE EU

Denmark became a member of the EEC in 1973 after a national referendum with 63.3% being in favour of membership and a voter turnout of 90.1%. As the project expanded towards becoming The European Union, a growing scepticism arose in the Danish population. In a referendum in 1992, 50.7% rejected the Maastricht Treaty. As a settlement to meet the scepticism, *opt-outs* were proposed in areas where *Denmark did not have to participate* after the transition into The European Union. At the second referendum in 1993, 56.7% voted in favour of the agreement. Two later referendums to abolish opt-outs have been turned down.



Former Danish prime minister, Jens Otto Krag, signing the European Community accession treaty on 22 January 1972 in Brussels. Photo: European Commission - Audiovisual Service.

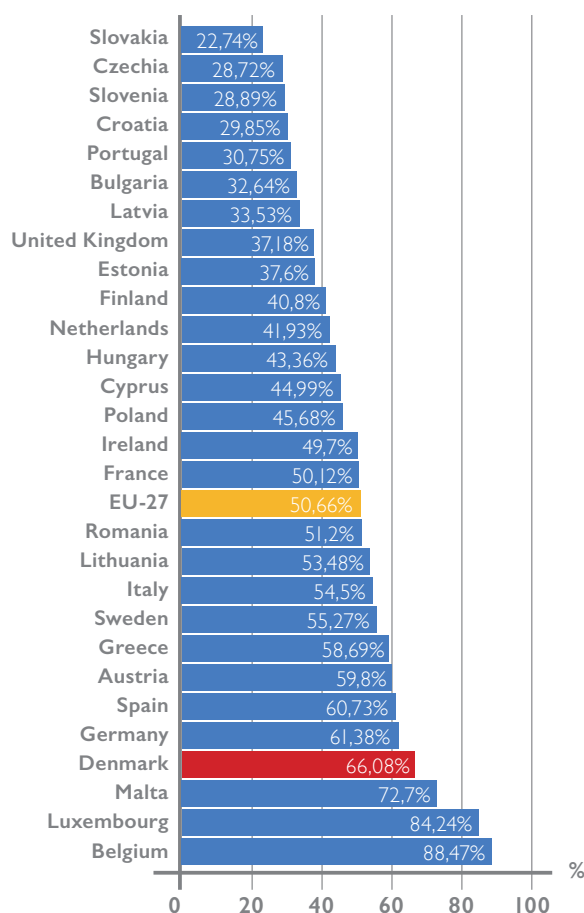
Despite the desire to maintain sovereignty in certain areas, the majority of citizens in Denmark supports the Danish EU-membership. In a poll from 2021, 82 % of the Danish respondents indicated that they believe the EU-membership has a positive effect on Denmark and the country's situation.

In general, the Danish citizens' attitude towards the EU has become more positive since the 1990s. This trend is especially evident among the Danish youth under 30 years who are more likely to support the EU. The per-

ceived advantages of being a part of the EU among the Danes are particularly the EU's ability to secure peace and stability as well as the securing of labour across the European Union.

Denmark has a tradition for high voter turnout. In 2019, 84,6% of potential voters participated in the Danish general election. In the European Parliament elections the same year however, only 66% voted. Even though this was significantly lower, Denmark still had the fourth highest turnout among EU member states, only surpassed by Malta, Luxembourg and Belgium of which the last two have *mandatory voting*. Denmark has 14 members of the European Parliament out of 705 members all in all.

### European Parliament elections 2019 - Voter turnout





## Covid and climate change

During the Covid-crisis, Denmark is one of the only countries that has had a positive view on the EU's role in the pandemic compared to other European countries and their citizens. At the same time the majority of people in Denmark believes that the Danish government has handled the Covid-crisis better than other EU-countries, according to a survey from Think Thank Europa.

According to a 2021-survey from Kraka, more than ⅔ of the citizens in Denmark want more collaboration across the EU-member states on themes such as climate change, crime, terror and the combat against tax havens.

In a Eurobarometer survey on climate change from spring 2021, 70% of Danish participants considered climate change to be one of the four most serious problems facing the world. 35% said that it was the number one serious problem.

## EU climate commitments

Danish policies are closely linked to policies adopted on an EU-level. This is also the case in relation to climate policies. According to EU-legislation, Denmark has to meet certain climate criterias in relation to agriculture, transport, and energy waste, industrial emissions (also referred to as Non-ETS sectors).

The total emissions of these sectors should be reduced by 39% in 2030 compared to the year of 2005. In the Danish Energy Agency's yearly climate projection report from 2021, a 35% reduction is expected in 2030. However, it is expected that the last 4 % points can be fulfilled by the implementation of more climate initiatives or by the utilisation of CO<sub>2</sub>-quotas from the EU's Emissions Trading Scheme.

Finally, Denmark's commitments to the EU in relation to renewable energy and energy efficiency have been fulfilled, and the amount of renewable energy is expected to increase overall. As you have already read in the Energy Mix section, Denmark has a high percentage of renewable energy in the energy system also when compared to other EU countries.

## Aviation taxes

Denmark is often viewed as a pioneering country within the EU when it comes to the green transition. This statement is true if looking at Denmark's ambitious



Copenhagen Airport. Credit: [Dornum72](#)

goals on greenhouse gas reductions and the development of green technologies. Nevertheless, there are several areas where Denmark is criticised for not being ambitious enough. One example is aviation taxes.

In contrast to all its neighbouring countries, Denmark does not tax air travel. According to green organisations, Denmark should at minimum introduce aviation taxes on the same level as Germany which is around 12.88 euro per passenger for shorter trips and up to 58.73 euro for passengers travelling longer distances.

This would contribute to the *polluter pays principle*, and is expected to decrease air travel by 6% in itself. In addition, this could create incentives for the aviation industry to develop green energy and most importantly finance the green transition. However, a common EU tax on aviation fuels is likewise suggested as an effective solution in the green transition of the aviation industry.

[Click here for questions and exercises about this section](#)

# CREATING A COMMUNITY

When trying to make climate-friendly choices in our everyday lives, we might often ask ourselves “do my actions really make any difference?”. Well, perhaps we don’t change much on a large scale, but the climate crisis is very complex, and many different kinds of actions are necessary in the green transition. It is a challenge that requires us to gather in communities and work together for larger changes.

It is valuable and meaningful to share thoughts and ideas with other like-minded people in a community. Especially as a young person, who is navigating in a world where the future sometimes feels uncertain and the state of the climate is frightening. When being in such a community, you can inspire and motivate each other, and for example start new green projects or fun events.

There are many ways of tackling the climate crisis in a community. You can become a climate activist, create a self-sufficient perma-culture garden, or arrange up-cycling workshops. Below, GRO SELV has made a DIY-guide on how you can arrange a local ‘clothing swap’.

## DIY: How to arrange a swap market

At a swap market, you give away clothes or other stuff that no longer serve your purpose. In turn you might find hidden gems in someone else’s old belongings. Swap markets are a good way to save resources and give new life to already used products. The market is easy to set up, and brings together many people. Go get your friends and get started!

### What you need:

- A room or alternatively an outdoor setting
- People who want to exchange things, for instance students from your school
- Tables or racks for the swap items
- Information signs to guide people around the market

### How to do it:

#### 1. Initial considerations

Find a place where you can have the swap market. You can ask at your school, local sport club, or the library if they have a room you can use. Consider what is going to be exchanged. Clothing, furniture, kitchenware

etc.? How long should the event last? Who should we invite? Do you need to make guidelines - for instance for how many items each person can take?

#### 2. Invitations

Invite people well in advance of the event, so they have time to consider what they can bring. You can create an online event, either public or private and invite as many people as your location allows for.

#### 3. At the event

Set up tables or racks, where people can put the things they bring. Make some information signs to keep all the things organized in different categories such as “shirts”, “pants”, “shoes” etc. Explain to people when they come how the market works.

#### 4. Donate the leftovers

Make sure you have a plan for what to do with the leftover items. If there is anything left after the market, you can donate it to the local secondhand shop. It can also be dropped off at the nearest recycling center.

## Pro-tip:

Make your swap market inclusive to everyone by not dividing the clothes into gender categories. Dresses, skirts, pants and shirts are for everyone, regardless of gender identity.



Photo from a Danish swap market. Credit: GRO SELV

[Click here for questions and exercises about this section](#)





# THE GREEN FUTURE OF DENMARK

As this chapter has shown, compared to other countries, Denmark has a relatively progressive approach to climate action. This is both the case within Danish politics with ambitious goals and targets, the private sector investing in green technologies and making their business more sustainable, and in the general public opinion where the climate is a top priority for many citizens.

Denmark is a small country and only responsible for a tiny fraction of the global greenhouse gas emissions. This leads sceptics to argue that what Denmark does in terms of climate action is more or less pointless. Climate action proponents, however, say that there is great potential in being a frontrunner in terms of taking more radical climate action that can inspire the rest of the world.

Despite the political approach to climate change, people living in Denmark still have a high individual consumption. People buy products and goods from all over the world and thereby have a high carbon footprint outside Danish borders. As you have read, Danes are concerned about the climate and express a willingness to change behaviour and make sustainable lifestyle choices. However, changing habits is generally a challenge for many people, and there is a need for political intervention at the level of individual consumption.

There is a big discussion in Denmark about the role of individuals vs. political leadership in tackling climate change. Some argue that politicians should for instance put tax on meat or introduce vegetarian days in public canteens. Regardless of the means, personal consumption and behaviour of people in Denmark need to change in order to decrease our carbon footprint.

## Room for greater ambitions

Denmark has passed the Climate Law with the objective of 70% reduction of greenhouse gases by 2030. This is a great achievement for Danish climate poli-

tics. However, the current strategy put forward by the Danish government is called unambitious by experts. They argue that Denmark could set a good example by scrapping the so-called “hockey stick” approach (mentioned in the Introduction) and instead take more ambitious steps. This includes measures such as the instruments proposed by the Danish Council on Climate Change and speeding up the expansion of green energy.

The green think tank CONCITO argues that some of the most important political steps for the green transition in Denmark are to invest in solar and wind power, the electricity grid, reduce the amounts of biomass in power plants as well as a high CO<sub>2</sub> tax as part of a green tax reform. Climate taxes are heavily debated. However, green organisations such as CONCITO argue that climate taxes are a crucial tool. If introduced in the right way, they will secure a transition with few costs across all sectors.

## Knowledge and skills to act

When it comes to climate action, setting political ambitions and goals is not enough. It is crucial that these ambitions and goals are followed up by concrete action plans - and not at the last minute!

In addition to the political initiatives, we as citizens need to discuss our individual visions for the future: Which values are important to us and how can these be linked to the green transition? Furthermore, it is crucial that we have the knowledge necessary to carry out the transition in practice. Citizens need to understand why big changes are needed and to have the green skills to act.

[Click here for questions and exercises about this section](#)

# Introduction

## THE NETHERLANDS

Yet another record! If you open any Dutch newspaper in the summer, you are very likely to come across an article about heat waves and national heat records broken again. A few decades ago the newspapers were not full of such reports. Yet, little by little, the Netherlands is heating up. In daily life one does not really notice this, but if you look at the figures it becomes painfully clear. Since 1906 the average temperature has increased by almost 2%.

In the summer of 2018, it was so dry in the Netherlands that residents had to limit their water use as much as possible. Quite a task, because not only was it one of the driest summers ever measured, it was also terribly hot. Drinking water companies hoped that restrictions would prevent a shortage of drinking water. Farmers, the shipping industry and water managers suffered enormous economic damage from the drought, between €450 and €2080 million.

Due to climate change, dry summers like the one in 2018 are becoming more frequent. At present such droughts occur only once every 30 years, but scientists expect that from the year 2085 onwards they could occur every 10 years. This is not an isolated Dutch problem.

### Climate change in the Netherlands

A lot of water enters the Netherlands from the neighbouring countries Germany and Belgium via large rivers like the Maas, the Waal, the Nederrijn and the IJssel. If upstream countries use a lot of water in dry periods, there is less left over for the Netherlands. International agreements on water use are therefore very important for the country.

The Netherlands is one of the most densely populated countries in the world and therefore consists largely of urban areas. In fact, about 75% of the population lives





in urban areas! Especially in cities, the rising temperature is causing problems. Cities are much warmer than the surrounding countryside due to many roads and buildings, less greenery and water and less wind. As a result, the heat remains longer there and the temperature remains higher.

The difference in temperature can be as much as 4 degrees for a city with 10.000 inhabitants and 7 degrees for a city with 200.000 inhabitants. The high temperature can be very problematic for vulnerable groups such as people with lung diseases, the elderly and children. In 2003, about 1400 people died prematurely in the Netherlands as a result of the extreme heat.

## Bad for biodiversity

For many animal and plant species, the higher temperatures are also not good news: species that thrive on warm weather are increasingly feeling at home in the Netherlands and can therefore become pests. An example of this is the oak processionary caterpillar, notorious in the Netherlands. The stinging hairs of this moth caterpillar cause intense itching in people and animals.

Another effect is that spring comes earlier: plants blossom and trees get their leaves earlier, insects appear and birds brood earlier in the year. This can cause problems for migratory birds that have missed the insect peak upon arrival in the Netherlands and cannot find enough food. Species that cannot adapt quickly enough to the changing circumstances run the risk of disappearing.

## Vulnerable to flooding

Everyone in the Netherlands knows what happened on 1st of February 1953 - either because they experienced it or because they learned about it at school: the 1953 North Sea flood disaster. A heavy north-westerly storm combined with spring tide caused large parts of the country to flood. 1.836 people did not survive the disaster, tens of thousands of animals lost their lives and many houses were destroyed.

This disaster was the reason for the famous Delta Works and for an extensive reinforcement of the existing dikes. As a result, the Netherlands is now the best protected delta area in the world. Nevertheless, the risk of flooding can never be entirely ruled out. Approximately 59% of the Dutch surface area is at risk of flooding: 26% is below sea level and 29% could flood if riv-

ers overflow their banks. The rise in sea level and the chance of more extreme rainfall due to climate change therefore form one of the greatest direct threats to the Netherlands.

## Increased climate awareness

Today, the climate is a hot topic in the Netherlands, but this has not always been the case. In the 1970s, some environmental organisations slowly began to have concerns about pollution. The first studies on climate change did however not appear until the 1980s. It became increasingly clear to scientists that climate change could have major consequences for the inhabitants of the Netherlands and the world. Every now and then, an article on climate change would appear in the newspaper, but there was no active climate movement in the Netherlands for a long time.

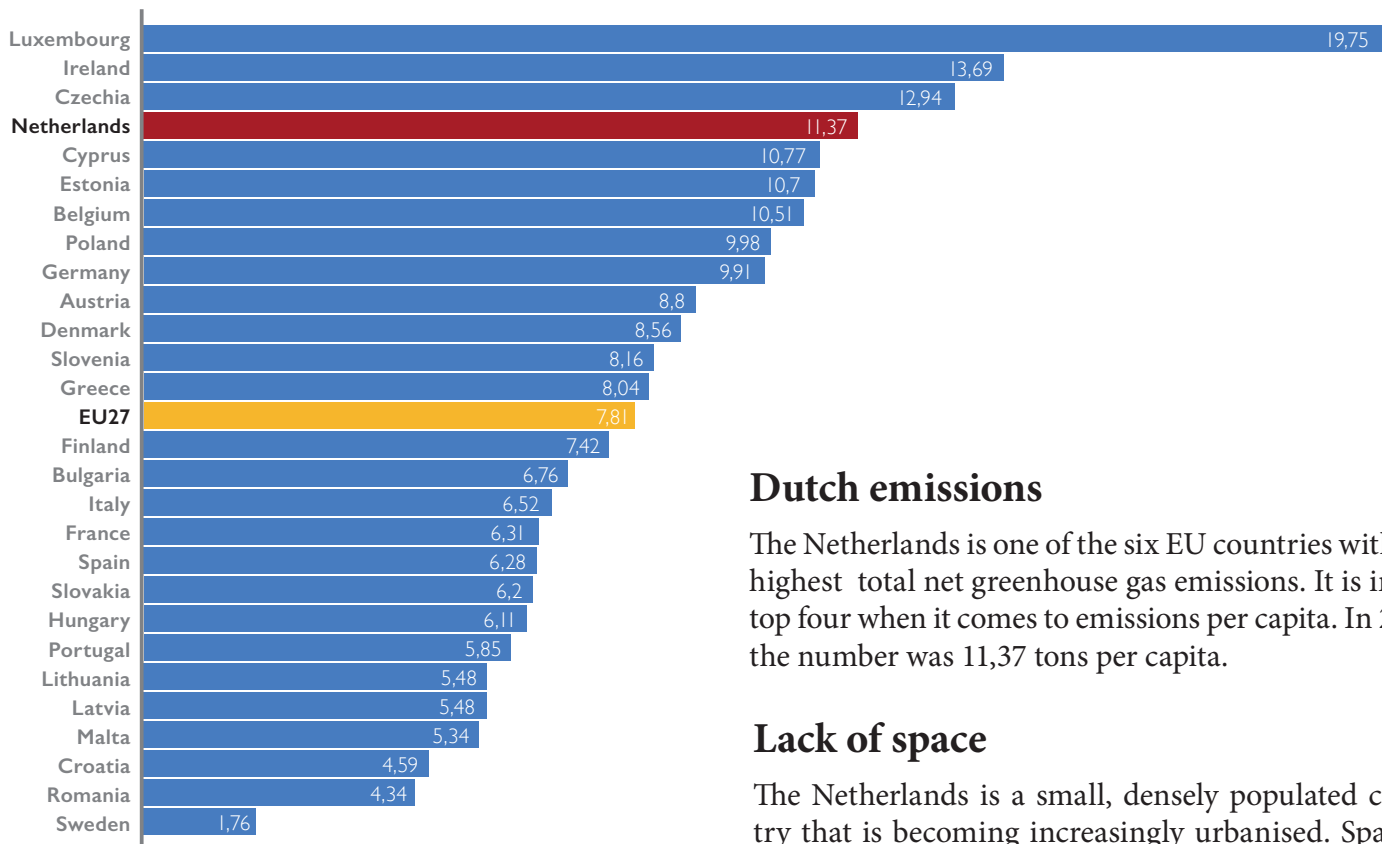
This was also reflected in government policy. At the end of the 20th century, legislation was mainly aimed at reducing pollution from the industry. Climate policy however received little attention. The Netherlands only took action in 2012, when a new cabinet was appointed.



*Farmhouse in flooded area, February 1953.*

The reduction target of 20% less CO<sub>2</sub> by 2020, imposed by the EU in 2007, was now very close. The government, employers, employees, energy companies, housing corporations, the environmental movement and many other organisations got round the table. On the 6th of September 2013, this resulted in the Energy Agreement. After signing the Paris climate agreement in 2016, the Netherlands set a new objective to emit 49% less CO<sub>2</sub> in 2030. By 2050, CO<sub>2</sub> emissions must be reduced by 95% compared to 1990. These two goals have been legally put into the Dutch Climate Act.

## Total net emissions per capita - All greenhouse gases - (CO2 equivalent) with international aviation (2019)



## Lawsuits for the climate

Although the Dutch government has formulated policies on how to meet its climate targets, it still takes too few measures to actually prevent dangerous climate change. The quantity of CO2 emitted by the Netherlands may be decreasing, but not fast enough to comply with the Climate Agreement. This has caused criticism from the NGO Urgenda and eventually a lawsuit against the State in 2013. In 2015, the District Court of The Hague ruled in favour of Urgenda: the State had to emit 25% fewer greenhouse gases in the year 2020 than in 1990.

This case has inspired other Dutch NGOs to similar lawsuits. In 2021, the climate organisation Milieudefensie won a court case against the multinational oil and gas company Shell. This is the first court case in the world in which a company is directly put on trial for its impact on the environment. The result was not an economic compensation but a demand for change in policy. The judge ruled that Shell has a global responsibility to reduce CO2 emissions more quickly and must take action.

## Dutch emissions

The Netherlands is one of the six EU countries with the highest total net greenhouse gas emissions. It is in the top four when it comes to emissions per capita. In 2019, the number was 11,37 tons per capita.

## Lack of space

The Netherlands is a small, densely populated country that is becoming increasingly urbanised. Space is very scarce, and yet the demand for space continues to grow. People want more nature, more houses, sufficient agriculture, recreation, solar parks, wind farms, motorways and more room for rivers.

It is therefore a big puzzle to find a place for windmills, solar parks and other sustainable initiatives. Many Dutch people do not want their view 'obscured' by windmills and solar parks and there is therefore a great deal of local resistance to this. Space is also needed for climate adaptation such as the widening of dikes and the creation of more nature.

The Netherlands is Europe's largest agricultural exporter and the second largest in the world behind the United States, a country 230 times bigger than the Netherlands. This again indicates how intensively space is used in the Netherlands. The agricultural sector is therefore an important part of the Dutch economy. However, it is accompanied by the emission of many greenhouse gases.

A majority of the Dutch political parties therefore want to halve the number of livestock. The government is making money available so that livestock farmers can voluntarily stop or change to less intensive livestock farming. However, this is a sensitive issue for farmers in the Netherlands and has led to many protests.





*"Use your common sense, keep farmers in our country". In recent years, there have been a lot of farmers' protests against the measures for the agricultural sector. Photo: Kees Torn*

## The debate today

Today, the climate debate has become an integral part of Dutch society. It is everywhere: in talk shows, on the radio, in newspapers. Everyone has something to say about it. People or politicians who are visibly committed to the climate and call on others to get involved are jokingly called climate pushers.

The climate discussion in the Netherlands is mainly about the size of the climate problem and the question of what role mankind plays in it. How bad is it that the earth is warming up and what can we do about it - and how much will it cost?

Fortunately, many Dutch people have realised that climate change is indeed a problem that we need to do something about. According to research from Statistics Netherlands in 2021, six out of ten think that climate change is caused entirely (12%) or mainly (48%) by humans. In the Eurobarometer survey from spring 2021, 71% of the Spanish Dutch say that their national government is not doing enough to tackle climate change. According to a survey from the Dutch Broadcasting Foundation, young people in particular believe that the climate problem should be tackled more seriously.

## The countermovement

Despite the growing awareness and support for combating climate change, protests are increasing in the

Netherlands against concrete measures that are necessary to achieve the targets. There is fear of job losses, high costs for homeowners, uncertainty for the future prospects of farmers and entrepreneurs and damage to landscape and noise pollution from establishment of renewable energy. Therefore there is a lack of support for many climate measures. This anti-climate voice is also heard in the Dutch parliament from a couple of parties who deny the climate crisis and want the Netherlands to withdraw from the climate agreement.

Most parties however acknowledge the climate issue but actions are still very slow. Furthermore, the business-oriented Dutch approach can sometimes be an obstacle to achieving the country's climate goals. For instance, when the largest onshore wind farm in the Netherlands opened in 2020, it could have provided electricity for 370.000 households. Instead most of the electricity was sold to a new Microsoft data centre established nearby.

Much remains to be done in the Netherlands in order to combat global change and protect the country from the effects of it. In the following sections you can read about some of the projects working to improve the Dutch climate effort.

[Click here for questions and exercises about this section](#)

# 2

## PORTRAITS

In this section you can read about four stakeholders working to reduce the consequences of climate change in the Netherlands. You can also watch the full interviews with English subtitles by clicking on the photos.



### **André Hassink: You can start to do something tomorrow**

André Hassink works as an area manager in the province of Limburg. A typical working day consists of a lot of talking with colleagues, farmers and organisations that plant trees. But also citizens who live in the area and have experienced the direct impacts from climate change. In the summer of 2021, the water level in the rivers of Limburg rose to a dangerous level due to heavy rainfall. Villages flooded, buildings were damaged, and nature reserves and farmland areas were destroyed.

»The amount of water coming down at once surprised all of us. The climate changes faster than we can keep up with. It can happen again in the near future,« tells André. He believes that the flood was also a chance for change though.

»This is not a problem that can be solved by one organisation. We have to get in touch with each other. With neighbours, with farmers, with the municipality, with villagers.

Everybody can do something about climate change. You don't have to study for years. You can start tomorrow with small things.«

### **Arien Scholtens: Important to get different people involved**

A Local Energy Initiative (LEI) is created by citizens of a certain neighbourhood or village. They make their area more sustainable by saving energy together, or by generating green energy via solar panels or wind turbines. Arien Scholtens works as sustainability officer and as a LEI Coach in the province Overijssel where she helps initiatives with the challenges they face.



Arien found her passion for the energy transition about ten years ago when she changed careers.

»Everything I heard about climate change sounded so terrifying. When I heard of peak oil - it made me think: let's get started with that energy transition now.«

Space is scarce in the Netherlands, which makes the energy transition a challenge. Therefore, it is important to get a lot of people involved and to make smart choices together. Ariens hope for the future is that more young people get involved with LEIs:

»Being part of a Local Energy Initiative is not always easy, but it is the best thing in the world to see how they manage to make it work. Together. A LEI can benefit from a diverse group of people, from every age and background. People that bring in different kinds of knowledge and skills. This is of incredible value!«





## Chan Botter: We can get a whole lot done

During her studies in Industrial Design, Chan realised that she wanted to do something meaningful with the things she learned.

»We are the first generation that will experience climate change, but we are also the last that can do something about it. That was exactly the thing that hit me! I wanted to contribute to that change,« she explains.

While studying Chan became team manager of SOLID, one of Eindhoven University's student teams. They work on a new, clean energy technology called Iron Fuel. It uses iron from scrap metal in a process releasing a lot of heat, which can be used as an energy source. The team is currently figuring out the reverse process: to turn rust into iron again.

»There are still a lot of challenges that we need to solve, but it is something that I believe in.«

New technologies like Iron Fuel are important in the energy transition: Solar panels and windmills are not consistent: the sun does not always shine, the wind doesn't always blow. We need solutions that can fill the gap. In the industries, we need high temperature heat which is very difficult to find and store. Energy mediums like Iron Fuel need to be developed, otherwise we will not be able to transition into a carbon free society, according to Chan.

She also hopes that she can inspire other students to do something about climate change:

»We can get a whole lot done, more than you think. If you have that drive, that one idea or if you just want to try something out. You can actually contribute to something meaningful!«

## Marcel Kleizen: Bicycles make the whole city more beautiful

»Cycling is the best invention ever!« Marcel Kleizens enthusiasm about cycling directly shows why he was chosen as Bicycle Major of The Hague. A voluntary but honourable function that lasts for two years. All in all, there are about 200 Bicycle Majors in all parts of the world.

»I want to increase bicycle usage in my city and increase cyclist's safety. Cycling is good because it's free exercise, it's fun and emission free,« he says.

Marcel has also founded a platform that connects different bicycle courier companies in the Netherlands, and he started a bicycle taxi company in The Hague. But the importance of cycling goes further, according to Marcel.



»Since the 1950's we created a system that puts cars in a central position in cities. But cars are super inefficient: 96% of the time, they are parked in the streets,« he says and points out that this takes up a lot of space.

Marcel believes that we should change the infrastructure of a city and replace cars with bicycles and small electric vehicles.

»This creates space for playgrounds or nature, which is also important in the light of climate adaptation. The whole city becomes more beautiful when more people start to use bicycles.«

[Click here for questions  
and exercises about this section](#)

# NATIONAL INITIATIVES

The Netherlands has identified its climate goals in the Dutch Climate Act. But a law alone will not reduce greenhouse gas emissions - good plans of action are needed. In this section you can get to know some initiatives on a national level from politicians, companies and civil society.

## Dutch Climate Agreement

Governments, companies and non-profit organisations have jointly identified a package of measures needed to halve GHG-emissions by 2030. This is called the Dutch climate agreement and sets out what the various sectors in the Netherlands must do to reach the objectives. These sectors are Agriculture and Land Use, Built Environment, Electricity, Industry and Mobility.



*Princess Amalia Wind Farm. Credit: Ad Meskens*

Representatives of each sector sets its own targets and takes its own measures to jointly reduce CO2 emissions. For instance, the Built Environment sector is working on a plan to switch all homes off from natural gas. The Electricity sector is working on the goal of generating 70% of all electricity from wind turbines and from solar panels in 2030.

To reach these goals, the government stimulates the construction of renewable energy projects by providing subsidies. One example of such a project is Princess Amalia Wind Farm. It covers an area of 14 km<sup>2</sup>

and consists of 60 wind turbines - enough to provide 125,000 households with power. This avoids 225.000 tonnes of CO2 emissions each year.

## Energy gardens

In 2021, the Netherlands used an area for solar panels equal to 12.000 football fields - located both on roofs and in solar fields. As important as these are for our sustainable energy production, they do take up a lot of valuable space, which could also have been used for food production, housing or biodiversity. As a solution to combine some of these elements, the Nature and Environment Federations came up with the 'Energy Garden' concept. A place where nature, recreation and sustainable energy come together.

The goal of the Energy Garden is to generate sustainable energy on a large scale but in such a way that the space is used in multiple ways. When installing the solar panels, attention is paid to biodiversity and food is grown in a sustainable way in so-called food forests. Residents can relax there, picnic and enjoy the view. The project also provides information about sustainable energy and biodiversity, and takes inputs from the visitors for further improvements. By closely involving local residents, it also creates more support for the project.



*Energy Garden Noordmanshoek. Credit: Jack Tillmanns*





## The Dutch Championship of Tile Tipping

You are probably familiar with the World Cup of football and European Championship of hockey, but have you also heard of The Dutch Championship of Tile Tipping? In this annual competition, various municipalities compete during spring and summer on which municipality can replace the most garden tiles with greenery? In 2022, all municipalities together had exchanged more than 1.5 million tiles for plants and flowers. That is more than 25 football fields combined!

The Dutch Championship of Tile Tipping is part of the campaign 'Making the Netherlands greener starts in your own garden'. During the campaign, municipalities and residents work together with so-called tile taxis. These taxis collect the tiles free of charge. As a result of the action, Dutch gardens and public spaces have become a lot greener. Residents play an important role in this, as approximately 50% of the land in cities is privately owned.

## Climate adaptation programmes

Dutch policy and climate law focus mainly on preventing climate change, the so-called climate mitigation. However, we cannot escape the fact that the climate is changing. Even if we manage to reduce the emission of greenhouse gases a little more in the coming years, the Netherlands will have to deal with more extreme weather and rising temperatures. The Netherlands is preparing itself for the consequences of climate change: climate adaptation.

The Netherlands is a low-lying country with a lot of water. The national Delta Programme protects the Netherlands against high water and flooding. It also ensures that there is sufficient freshwater and contributes to a climate-resistant and water-resistant layout of

the country. Some examples are plans for raising and strengthening the dikes and action plans in case of an unexpected water emergency.

The Delta Plan for Spatial Adaptation is analysing how vulnerable cities, villages and rural areas are to climate change. This is done with stress tests on heat, drought and flooding. If a town or village is too vulnerable, then the groundwork will be done to make the area more climate-proof. Other challenges, such as generating sustainable energy or boosting biodiversity, can then be incorporated directly into the plans. The plan therefore devotes a great deal of attention to these linked opportunities which can utilise the limited space in optimal ways.

The National Adaptation Strategy (NAS) focuses on adaptation of sectors such as agriculture, nature, health and infrastructure. This programme focuses not only on the risks of climate change, but also on the opportunities. For instance the fact that in the future, the Netherlands will be able to grow new crops such as soy and grapes.

### Water policy

Climate change plays a major role in the risk of flooding. Land area is disappearing as the sea level is rising. The number of heavy showers is increasing and



*The Oosterschelde flood barrier is the largest and most famous of the Delta works. The 9 km-long storm surge barrier seals off the inland sea Oosterschelde from the North Sea when there is a threat of high water. The barrier has been in use since 1986.*

*Credit: Bert Kaufmann*



*Making more room for the river. Credit: S.J. de Waard*

becoming more extreme. At the same time, the consequences of a flood are ever greater, as the Netherlands is much more densely populated than 70 years ago. That is why the Netherlands has a strict water policy.

By 2050 the Netherlands must be so-called water-robust. The core objective is that the risk of death from flooding for Dutch people must not exceed 1 in 100.000 per year. In practice, this means that our dikes are continuously tested for strength and reinforced if necessary. In addition, the Netherlands has more than 3.700 kilometres of so-called technical installations that form a barrier between us and the sea or water from inland.

Most water programmes in The Netherlands focus on raising or strengthening dikes to prevent flooding. The project 'More Room for the River' is however focused on working with the river. In many places, the riverbed is being deepened so that there is more room for the water. Also, the area along the river that floods at high water, will be lowered or widened. The rivers will also get more space by placing the river dikes further inland.

## Heat stress

It is no news that prolonged exposure to high temperatures disturbs sleep, changes behaviour and decreases productivity for humans. In fact, Emperor Napoleon Bonaparte (1769 - 1821) was already convinced of this. The long French rows of plane trees were built so that his soldiers could march in the shade and not get exhausted from the sun on their way to a battle.

High temperatures are well taken into account in many buildings in southern Europe. The medieval towns in Italy and Spain are characterised by narrow streets with high buildings, through which hardly any sunlight penetrates. The houses have thick walls and small windows, and the squares often have cooling fountains. Cool during the day, and in the evening it remains pleasant because the heat lingers for a long time.

This is different in the Netherlands where the sun gets plenty of space in the cities. Many facades consist entirely of glass to make the most of it. However, this seems outdated as the temperatures are rising and heat waves will become more frequent in the future.

The National Adaptation Strategy (NAS) includes ideas for counteracting increasing heat stress. For instance by making the cities greener. Trees are the most effective measure in this respect: Besides providing shade, they also remove heat, as they cool down by evaporating water. In the province of Overijssel, the government has therefore set up the project "One tree for everyone", where a tree will be planted for every inhabitant.

Another initiative is the national Plan Tree project by the non-profit organisation Natuur en Milieufederaties. Their goal is to plant no fewer than 10 million extra trees in the Netherlands in four years' time. It is estimated that there are now around 150 million trees in the Netherlands. Other measures are the construction of green roofs and facades of buildings which also help to cool the environment.

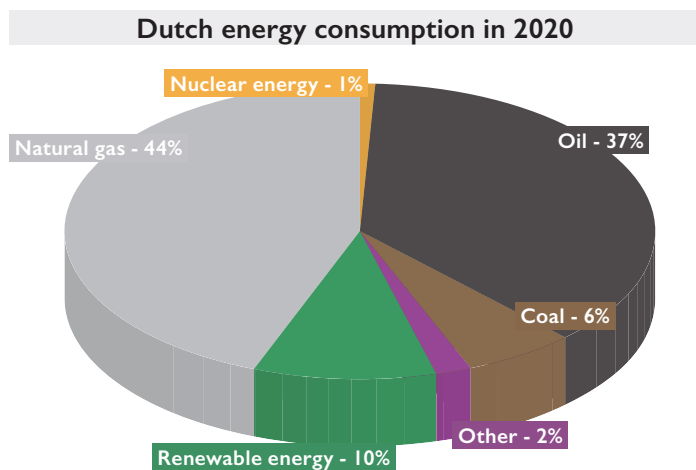


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# DUTCH ENERGY MIX

Almost 90% of the primary energy consumption in the Netherlands comes from fossil energy sources. Compared to other European countries, the Netherlands stands out in a negative way. In fact, the Netherlands is also one of the countries furthest away from their national binding targets, coming short 4%. This has some practical reasons based on natural conditions and lack of space. Another reason is that government subsidies for renewable energy production have been lower in the Netherlands compared to other countries.



## Fossil energy sources

In 1959, a big natural gas field was discovered in the Netherlands. The Groningen Gas Field turned out to be one of the biggest sources of natural gas in the world. The export of natural gas led to great wealth in this small country. The Delta flood barriers as well as most of the welfare system were paid with gas money. Big gas pipes were put underground, and even up to this day almost every building is connected to it.

In 1986 for the first time, the downside of extracting gas came to light. The northern part of the country became affected by small earthquakes. Since then, about a thousand have been registered during the years. The most severe one was in 2012, with a magnitude of 3.6 on Richters scale. This started a national discussion on the future extraction of natural gas and led to a drastic reduction in 2013.

In a few years, the Netherlands lost its energy independence and changed from a big gas exporter to an importing country. The consumption of gas however has stayed about the same for the following years, as natural gas is still used to warm existing buildings in the Netherlands.

Due to newer government regulations this is slowly changing though. From 2018 new-build houses can only be constructed without a gas connection. There are also subsidies available to isolate existing houses and to switch to other heating solutions such as heat pumps.

## Oil

The second largest component in the Dutch energy mix is oil. Almost all crude oil is imported, but the Netherlands is a large producer and exporter of oil products, such as gasoline, diesel and petroleum. Around 90% of these oil products are used in the transportation and energy sector.

## Coal

The Netherlands has no domestic coal production. All coal is imported from other countries. About one third of it is used for heavy industries, such as the steel industry. The remainder is used for energy production. As long as there is no good alternative for the heavy industries, coal use will probably not decrease. However, hydrogen is being researched as a renewable successor for coal.

## Nuclear energy

There is one nuclear power plant in the Netherlands and the government has plans to build two additional plants. The use of nuclear energy is highly debated in Dutch politics due to safety concerns for a densely populated country. Some green parties and organisations argue that it is too late to use nuclear energy to meet the 2030 goals as building a nuclear power plant takes decades.

## Renewable energy

Primary production and usage of renewable energy in the Netherlands is increasing every year. However, in 2020 only 10% of the energy consumption came from



*Gas drilling facilities in Groningen. Credit: [Pierre Crom](#)*

renewable sources. Now that 2030 is coming closer, the Netherlands prepares for a sprint to still meet their ambitious goals.

### **Wind energy**

The Netherlands is famous for its (antique) windmills, which shows that wind is a good energy source for the Netherlands. Because of little available space, turbines on land will always be close to villages and cities, which causes friction amongst inhabitants. Building windmills offshore, in the North Sea, has become more cost effective over the years. This resulted in an increase of offshore energy production to one third of total wind energy production.

### **Solar Energy**

The sun does not shine a lot in the Netherlands, but solar energy still has high potential. Solar energy production and usage are increasing, and one reason is increased governmental subsidy. For house-owners,

it has become a very viable investment to install solar panels.

### **Biomass**

More than half of the Dutch renewable energy production comes from biomass. The consumption is however highly debated. Biomass is basically burning, gassing or fermenting organic sources, such as wood or waste from industry, farms and households. Often wood used as biomass is imported from other countries. This causes deforestation, while burning materials faster than they can grow also increases the level of CO<sub>2</sub> in the atmosphere. Biomass is seen by many as an in-between energy source before full transition to renewable energy sources is possible. The Dutch government has made plans to phase it out.

[Click here for questions and exercises about this section](#)



# LOCAL INITIATIVES

In addition to the larger national initiatives, there are also smaller-scale projects working to make the Netherlands more sustainable. In this section you can read about local forces joined to make the Netherlands more climate friendly.

## DakAkker Rotterdam

In the Netherlands, there are approximately 345 million m<sup>2</sup> of flat roof. Could this space also be utilised in a useful way? In Rotterdam, they are already working on it. There you find the largest rooftop farm of the Netherlands and one of the largest in Europe: the DakAkker. Vegetables, fruit and flowers are grown on the roof of about 1000 m<sup>2</sup>.

There is also room for bees, and experiments with water storage are taking place. All this can be visited through excursions arranged by the public foundation behind the project. The products grown on the DakAkker roof are sold to local restaurants, which saves 'food miles' as the products do not have to be transported by car, but are simply collected by bicycle or on foot.



## Blue gardens

Helping 1.000 households to make their gardens water-friendly in three years. That was the goal of the citizens' initiative of '1.000 Blue Gardens' in the city of Tilburg. One of their actions is to distribute and install rain barrels in private gardens. By collecting the rainwater during wet periods, the garden can be watered during dry periods without having to use precious drinking water. On their website, participants can score their garden on water-, nature- and animal-friendliness and receive tips to improve their efforts. For inspiration, the participants can visit each other during various Open Blue Garden days, in order to learn from each other's water-friendly gardens.







## Tiny Forests

In 2015, the first Tiny Forest® in Europe was planted on the initiative of the NGO 'IVN Natuureducatie'. Since then, more than 200 have been added in the Netherlands. A Tiny Forest® is a compact nature area the size of a tennis court with a number of specific characteristics. For example, it must contain at least 25 different types of trees, and it has to provide space for them to grow undisturbed for at least 10 years. Such a miniature forest not only increases biodiversity, air quality and water storage, it also counteracts heat stress. Plants absorb heat and cool the air by transpiration. The Tiny Forest trademark also has a number of so-called 'social' characteristics. For instance, a Tiny Forest® always has an outdoor classroom for at least 30 pupils, and is planted by local residents and schoolchildren. You can find more information in English on the Tiny Forests website.

## Energy-neutral village

Many energy cooperatives are started up by residents in the Netherlands with the aim to generate green energy. By paying a fee, local residents become partial owners of the installations and can make use of the green power. In the village of Terheiden they go a step further. The goal of their energy cooperation 'Traais EnergieCollectief' is to generate enough sustainable energy to meet their own energy needs, which is approximately 6000 households. They also want to offer

an alternative to the use of natural gas. If this succeeds, the village will become the first energy-neutral and natural gas-free village in the Netherlands. To accomplish this they are focused on establishing solar fields and panels on roofs, windmills, energy saving measures, geothermal energy, and they are even using heat from the river!

## Electric car sharing

Although the Netherlands is known as a country of bicycles, there are also many cars. About 92% of these drive on petrol or diesel. In order to reduce CO2 emissions, the number of cars must be reduced and the share of electric cars increased. In recent years, more households have started sharing cars in the Netherlands. This means that fewer cars and parking spaces are needed. In this way, a shortage of space in a neighbourhood can be solved or extra space can be created for green areas. Sharing cars is therefore not only more sustainable and cheaper, it also creates a better living environment. To be truly sustainable, these cars must of course run on electricity from renewable sources. That is why about 25 energy cooperatives in the Netherlands also offer car sharing and charging stations. In this way, excess wind or solar energy can be stored in the cars' batteries and used at a later time.

[Click here for questions and exercises about this section](#)



# DUTCH VIEW ON THE EU



*Paul Henri Spaak receives the first European passport issued by the ECSC.*

The Netherlands has been cooperating with other countries in a European context for more than 70 years. It all started with the European Coal and Steel Community (ECSC) in 1951. This treaty regulated the joint control of heavy industry and mining in six European countries: Belgium, Luxembourg, Germany, France, Italy and the Netherlands. This European Community was a precursor to what would later become the European Union.

## European cooperation: good or a bad thing?

The Netherlands has long been known as one of the greatest advocates of the European Union. However, in recent years Euroscepticism has increased in the country. This became clear in 2005, when the Dutch citizens voted against the introduction of the European Constitution in a referendum with a majority of 62%.

In the annual Eurobarometer surveys, the Netherlands is still among the EU positive countries though. In spring 2021, 79% of the Dutch respondents indicated that they believe that the membership of the EU is generally a good thing. Only 6% said that it is a bad thing, while 15% said that it is neither good nor bad. However, 50% answered that they are rather in favour of the EU - but not the way it is working at present. Also, 85% say that EU citizens' voice should be taken more into account for decisions related to the future of the Union.

The Netherlands is below EU average when it comes to the participation in the European Parliament elections. In 2019, 41,9% of the potential Dutch voters participated - 8,7% below the average of 50,6%. The Netherlands has 29 members of the European Parliament out of 705 members all in all.

## Climate change and the EU

In a Eurobarometer survey on climate change from spring 2021, 70% of Dutch participants considered climate change to be one of the four most serious problems facing the world. 34% said that it was the number one serious problem.

According to the governmental study “Onze Kijk op Europa” (Our View of Europe), 68% of the Dutch citizens think that the EU must take the lead in the fight against climate change. It is based on a representative panel survey and in-depth online and physical dialogues between Dutch citizens on various themes - one of them being the climate.

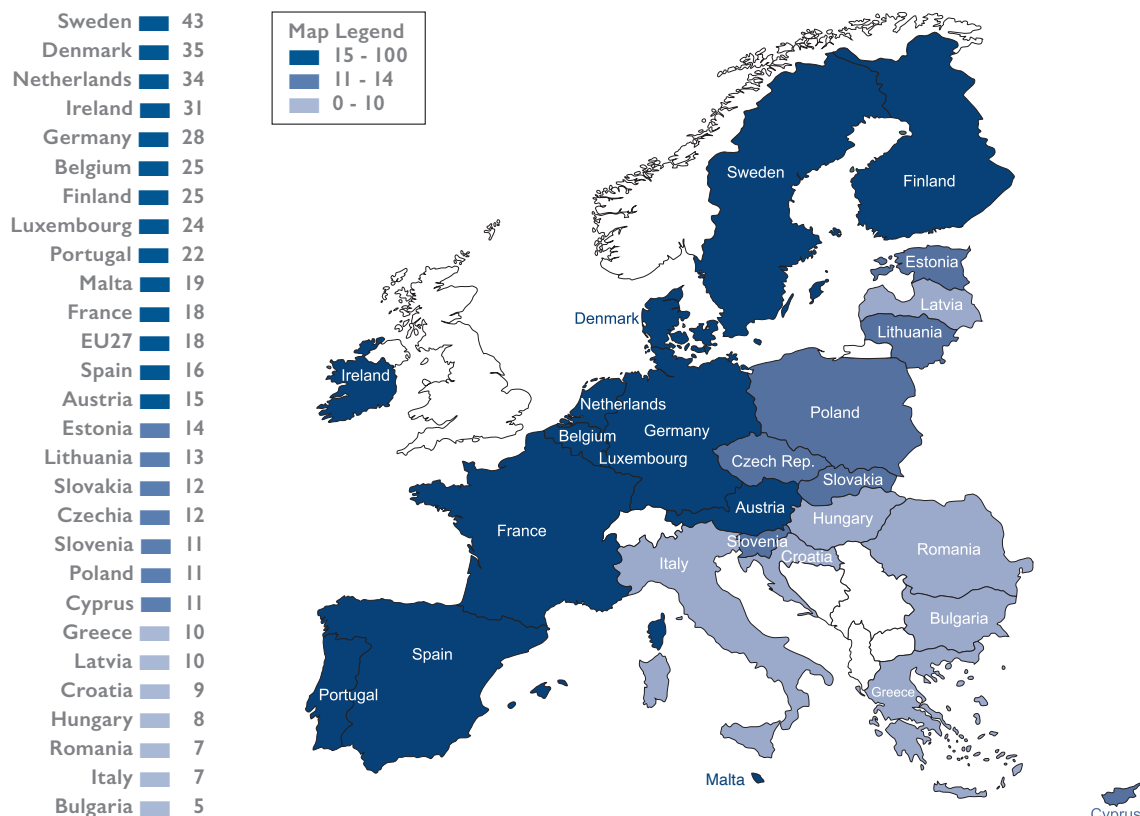
Here, the participants expressed that global warming is a problem and no country can solve it alone. Therefore, the EU should have a clearer vision of the future. Tackling climate change is seen as something that costs a lot of money, but it also offers opportunities. For instance by stimulating local food production and the development of new, sustainable technology. The EU could do more to tell that story, according to the participants.

Overall, the European Union can count on support from the Netherlands on the climate agenda. Yet not everyone is happy with the current climate plans. GreenPeace Netherlands, for instance, is criticising the EU targets for not being ambitious enough. More ambitious goals of the European Union would however mean that the Netherlands needs to work even harder, since it cannot even meet the current climate goals.



*Pictures from citizens' dialogue meeting. Credit: Kijk Op Europa*

### Climate change considered as the single most serious problem facing the world as a whole.



[Click here for questions and exercises about this section](#)



# ENERGY INNOVATION

One of the big challenges in the green transition is about energy storage. Not every day is sunny (especially in the Netherlands!), and the wind does not blow continuously. At the same time, we want warm houses, be able to drive our electric cars and turn on the washing machine whenever we want. This means that we need to find a way to store electrical energy when there is a surplus, and release it on demand.

You might say: “Hey, there is a great solution for that: batteries!” That is true! Batteries are very efficient in storing and releasing electricity on demand. But there is a problem. Batteries like those in your phone, your laptop, but also in electric cars consist of rare elements like cobalt and nickel. These elements are not infinite. There is simply not enough of these materials on earth to make batteries for all countries in the world. Therefore, we have to come up with new ideas to store energy: renewable batteries for renewable energy.

Earlier, in the interview section, you could read about one idea: Iron Fuel. Here you can read some other solutions that innovative researchers and companies in the Netherlands have come up with.

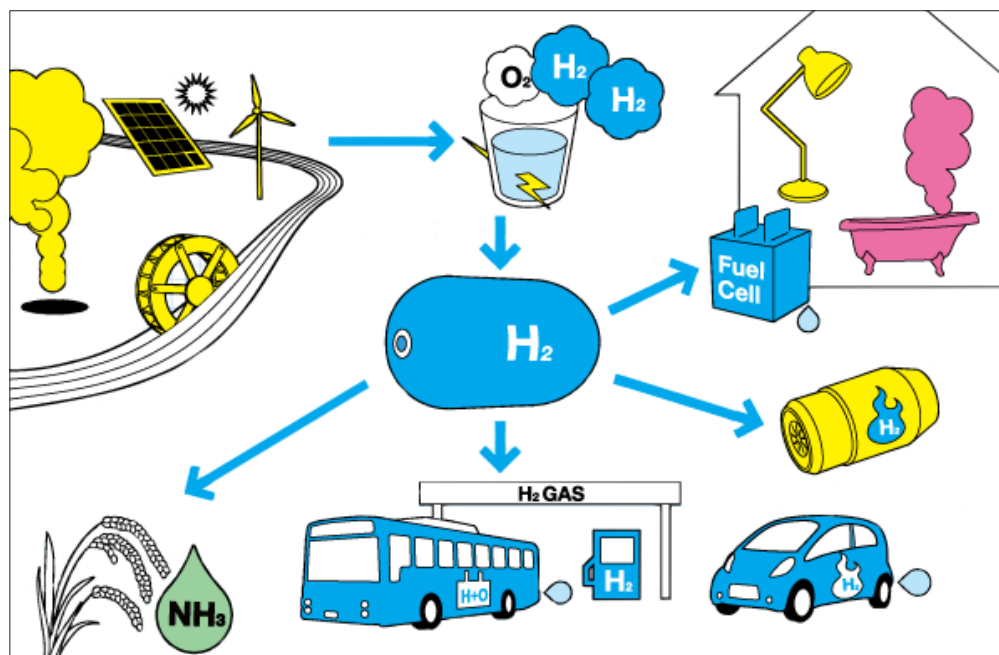
## Hydrogen

One solution to replace fossil energy is emission free hydrogen. For this we can use electricity from wind turbines or solar panels in a process called electrolysis. With the use of electricity, water molecules ( $H_2O$ ) are separated into two hydrogen ( $H_2$ ) atoms and one oxygen ( $O$ ) atom. Hydrogen then exists as a gas.

What can we use that for? First of all, as a fuel in big industries such as steel production. These industrial processes need high temperatures that are currently reached by burning coal and gas. Electrical energy is not powerful enough to reach such temperatures, but hydrogen is.

Secondly, hydrogen can be a solution for warming old houses that cannot be isolated easily. Hydrogen can replace natural gas where electricity cannot do the job. Hydrogen gas can also be used as green fuel for cars and buses, and especially for long distance transportation it can be more useful than electricity.

Why not recycle the old gas pipes to transport hydrogen from the production location to factories? NorthH2



*The technology of turning renewable energy into emission free hydrogen. Credit: Rh2network*

is a Dutch project researching this idea”. In their lab, researchers work on optimisation and upscaling of the electrolysis process in order to make it more robust and efficient. This is needed, because the electrolysis process yet has an efficiency of only 70%, which means that 30% of the energy put in is just lost.

When will we see the first hydrogen-powered houses and factories? This may take a while! Experts say not even before 2030. First, a lot of aspects need to be researched by universities and companies.

## Blue batteries

Researchers from Delft university started their search for green energy by thinking of materials that are cheap, abundantly available and safe. They ended up with the most abundant thing on earth: salt water.

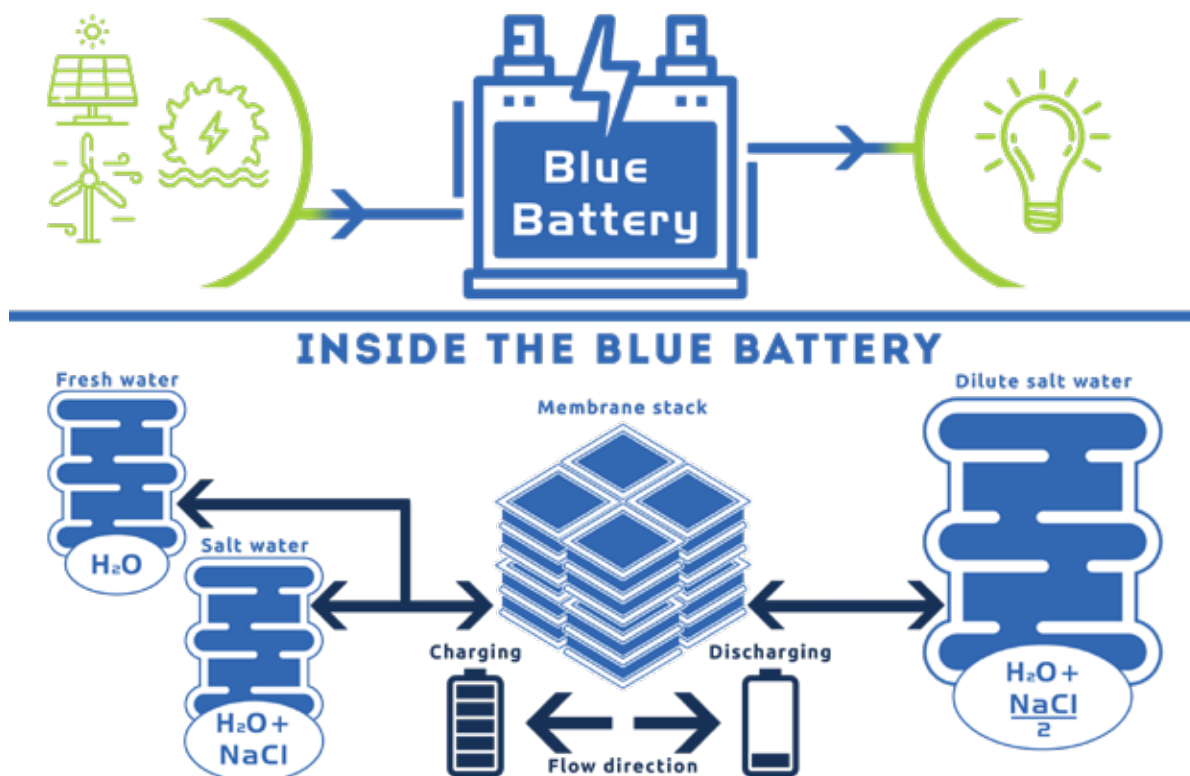
From this you can make a blue battery! You start with a tank filled with salt water. You also need membranes. A membrane is a barrier for water that still lets salt through. To charge the battery, electricity is connected to the membrane. This will split the water into fresh-water and super-salt water, that are both stored in separate tanks. When energy is needed, the freshwater and super-salt water are combined, and this is what releases energy.

Aquabattery is working on this principle for use in large-scale renewable energy applications (e.g. solar parks, wind farms, islands, microgrids, industrial areas). They expect to have developed a product in 2025. However, one challenge of the blue battery is its size. The battery to heat one house is the size of several washing machines. Not something you want in your flat! By adding another step, the battery becomes more efficient. In this step, which is still in the pilot phase, the water is split again into acid and base (which is the opposite of acid), using electricity. As a result, more energy can be stored in a smaller space.

## What do you think?

These are just some examples of innovative ways to deal with the green energy transition. And as you see: creativity and determination are key to come up with smart solutions! Do you think these are good solutions? Would they also work in your country? Or can you come up with an ever better idea?

[Click here for questions and exercises about this section](#)



*The technology of turning renewable energy into a blue battery. Credit: Aquabattery*





# THE GREEN FUTURE OF THE NETHERLANDS

## We can still go a long way

Heat stress, floods, heavy rainfall, extreme drought: these are the main consequences of climate change that the Netherlands is facing. There are a lot of national and local initiatives that try to counteract climate change (climate mitigation) on the one hand, and protect the country against the consequences of climate change (climate adaptation) on the other hand. Still, we see that the Netherlands is lagging behind on climate goals that were agreed upon in the Paris Climate Agreement. Why is this? And more importantly, what needs to be done to change this?

An important reason is that politicians easily underestimate what is needed to realise the national climate challenge. They prefer to postpone the unpopular decisions required by climate policy until after the next elections. It is politically tempting not to do more now than what seems strictly necessary, and to present statistical numbers optimistically.

Many Dutch people think that climate change is a problem, but when the impact of climate policy approaches, resistance arises. Hardly anyone is against renewable energy as such, but if a wind turbine suddenly appears right behind your garden, people think: hey, there goes my view! The climate crisis therefore calls for decisive governments and politicians who dare to make choices.

## How should the Netherlands reduce emissions?

Every person can look at their own climate footprint and what they can do to reduce it: Fly less, eat more vegetarian food and take shorter showers are just a few examples. But the greatest impact can be made in energy companies and industry. Energy companies, especially power plants, account for a large share of emissions in the Netherlands: about one third of total CO<sub>2</sub> emissions. A major cause is that the energy sector is still heavily dependent on fossil energy.

Wind energy is one of the important sustainable energy sources for achieving the climate objectives. The aim is that by 2030 wind farms will jointly produce energy for approximately seven million households. To make that happen, we need decisive politicians who dare to point out areas for wind turbines. An important key to creating public support for this is to ensure that residents' ideas and objections are heard and given a place in the implementation plan.

Although the Netherlands is not a very sunny country, it is sunny enough to generate solar energy. In order to make the best possible use of the scarce space, we need to cleverly integrate solar panels into our surroundings and the landscape. For instance on facades and roofs, incorporated in the road surface or in crash barriers - or even on the dikes. There are already companies in the Netherlands working on solutions for making road surfaces that generate solar energy. The Energy Garden in this chapter is another good example of how solar energy can be incorporated into the landscape.

## Sustainable industry

Energy is not always generated when the most energy is needed. Therefore, even more investments will have to be made in energy storage. The Iron Fuel method developed by Team Solid in this chapter is a good example of an innovation that can help us with sustainable energy generation in the future.

The Netherlands can also achieve much by making industry more sustainable. About one third of the CO<sub>2</sub> emissions in the Netherlands come from industry. Most Dutch companies are fully dependent on fossil fuels. Therefore, an energy transition will have to take place in industry, in which fossil fuels will eventually be replaced by sustainable energy.

The Netherlands is working on stricter regulations for industry with regard to emissions and environmental pollution. Preferable such regulations should be tightened up at European level. If only the Netherlands



makes stricter regulations, companies might move to surrounding countries where the rules are more relaxed. Fortunately, neighbouring countries in Europe are also working on better regulations for sustainability in industry.

## All solutions in play

This chapter has shown that there is not one Holy Grail in solving the Dutch climate problem. It is not just a question of generating more sustainable energy or just planting trees. It is not just about changing the behaviour of consumers or just making businesses more sustainable. It is not a question of either/or. It is both/and!

The European climate targets have been raised from 49% to 55% fewer emissions in 2030. For the Nether-

lands, this means that the combined emissions from homes, offices, traffic, agriculture and small industry must be reduced by 7% more than stated in the Climate Agreement. This will require an extra effort due to the backlog that the Netherlands has accumulated in the green transition.

Although the Netherlands is lagging behind on its climate goals, the country can still do a lot to catch up or minimise this lag. With aware citizens, decisive administrators, motivated companies, good policies and innovative solutions, we can go a long way!

[Click here for questions and exercises about this section](#)



*Workshop before a demonstration against natural gas in Groningen.  
Credit: [Pierre Crom](#)*



# Introduction

## SERBIA

In May 2014, a low-pressure cyclone occurred over the Adriatic Sea. It quickly spread to the Balkans and caused extreme rainfall, floods and landslides. The rain was the heaviest in 120 years of recorded weather measurements in Serbia. It affected 1.6 million people living in 38 municipalities and towns in central and western Serbia. 300.000 households were left without electricity, while 30.000 people had to be evacuated as their homes were completely flooded.

More than 10.000 volunteers helped set up sandbags along the Sava River to prevent it from overflowing. During the floods, traffic across the country stopped as public, industrial and infrastructure facilities were flooded, and thousands of roads were destroyed.

The flooding also created enormous agricultural damage. Thousands of domestic animals perished in the floods, causing serious health risks for people who started returning and repairing their homes. The total amount of economic damage in the country was estimated at 1.53 billion euros.

### Climate change in Serbia

The Balkan region is one of the areas in Europe that is most affected by climate change. This is clearly seen in more frequent weather extremes such as heavy rain and floods as well as summer periods of extreme heat and droughts, which are inevitably accompanied by fires. Between 2008 and 2017, temperatures in Serbia



*Streets under water in Obrenovac, May 2014. Credit: Oliver Bunic / Audiovisual Service*

were more than 1.5°C higher compared to the period before the year 2000. Nine out of ten of the warmest days in measured history were registered after the year 2000.

Climate changes in Serbia disturb all aspects of life, affecting both the state and the citizens. However, the impact of climate change is most pronounced in the following domains:

### 1. Agriculture

In Serbia, more than 40% of the population lives in villages and is directly dependent on agricultural production, which accounts for 10% of Serbia's GDP. The greatest damage to agriculture is caused by drought which affects most crops. In 2020, the economic loss was estimated to be more than 440 million euros.

Higher temperatures also cause storms with strong winds and hail, which physically damage the yield or the whole plant. In addition, it attracts new types of pests and plant diseases. Furthermore, the heat causes lack of water for animals, green grass for grazing as well as the inability to prepare sufficient amounts of animal feed for the winter periods.

### 2. Forestry

Forests cover 29% of the territory of Serbia. These are in constant danger of climate occurrences, such as



*Credit: Nadya Shuran, via Unsplash (CC0)*

droughts, fires and pests. In 2020, 26 forest fires were recorded in Serbia, covering approximately 4.000 hectares of forest area.

### 3. Hydrology and water resources

Due to increased evaporation and minimal rain, most areas in Serbia experience a shortage of water in the summer months. In the past several decades, the rivers in the south of Serbia have less and less water each year. This is caused by a decrease in snowfall during the winter period and a decrease in water storage in the soil. In contrast, Serbia has frequent floods caused by heavy rainfall occurring in a short period of time.



*Credit: Matt Howard, via Unsplash (CC0)*





*Credit: Filip Zrnzević, via Unsplash (CC0)*

However, due to the extreme droughts, the surface layers of the ground crack, the grass dries out, the plants wither and the huge amounts of water ultimately run into streams and overflow.

#### **4. Biodiversity**

Serbia is known for endemic species which are extremely attached to their

habitat and cannot survive anywhere else. Climate change disrupts the conditions to which these species are accustomed and therefore they start disappearing.

For instance, Pančić spruce, the oldest European tree species, has within the last 10 years begun to die out. Some of the reasons include extremely high temperature levels, other changes in the habitat itself, and the spread of other tree species that favour the new conditions.

### **How is Serbia fighting climate change?**

According to the official policy of the government, Serbia's primary goal is economic development (for instance by opening of lithium mines) and energy sta-

bility (for instance by the reconstruction of coal power plants) with rather little attention to environmental pollution and GHG emissions.

For many years, in the public and political system, climate change was considered a part of the environment on which Serbia as a small country did not have much influence. Therefore, Serbia has so far not been a particularly active participant in the mitigation of climate change. So far Serbia's engagement has mainly involved the drafting of laws, bylaws and regulations. The transition from adoption to real political action is happening extremely slow though.

In 2017, Serbia signed the Paris Agreement on Climate Change and committed to reducing greenhouse gas emissions by 9.8% by 2030 as compared to 1990.

In the same year, The Ministry of Environmental Protection was established as an independent ministry. Since 1991, the environmental issue had been a part of other ministries, for instance, The Ministry of Agriculture and Environmental Protection. The new ministry has the obligation to manage and monitor all activities in the environment, including climate change. It can also propose laws and regulations and implement certain sanctions for violation of the laws.

The ministry adds to the Serbian Environmental Protection Agency (SEPA) which was already founded in 2010. SEPA is in charge of developing and maintaining the national information system. This includes the collection of data and monitoring areas such as air and water quality. It publishes reports on all environmental parameters on an annual basis.

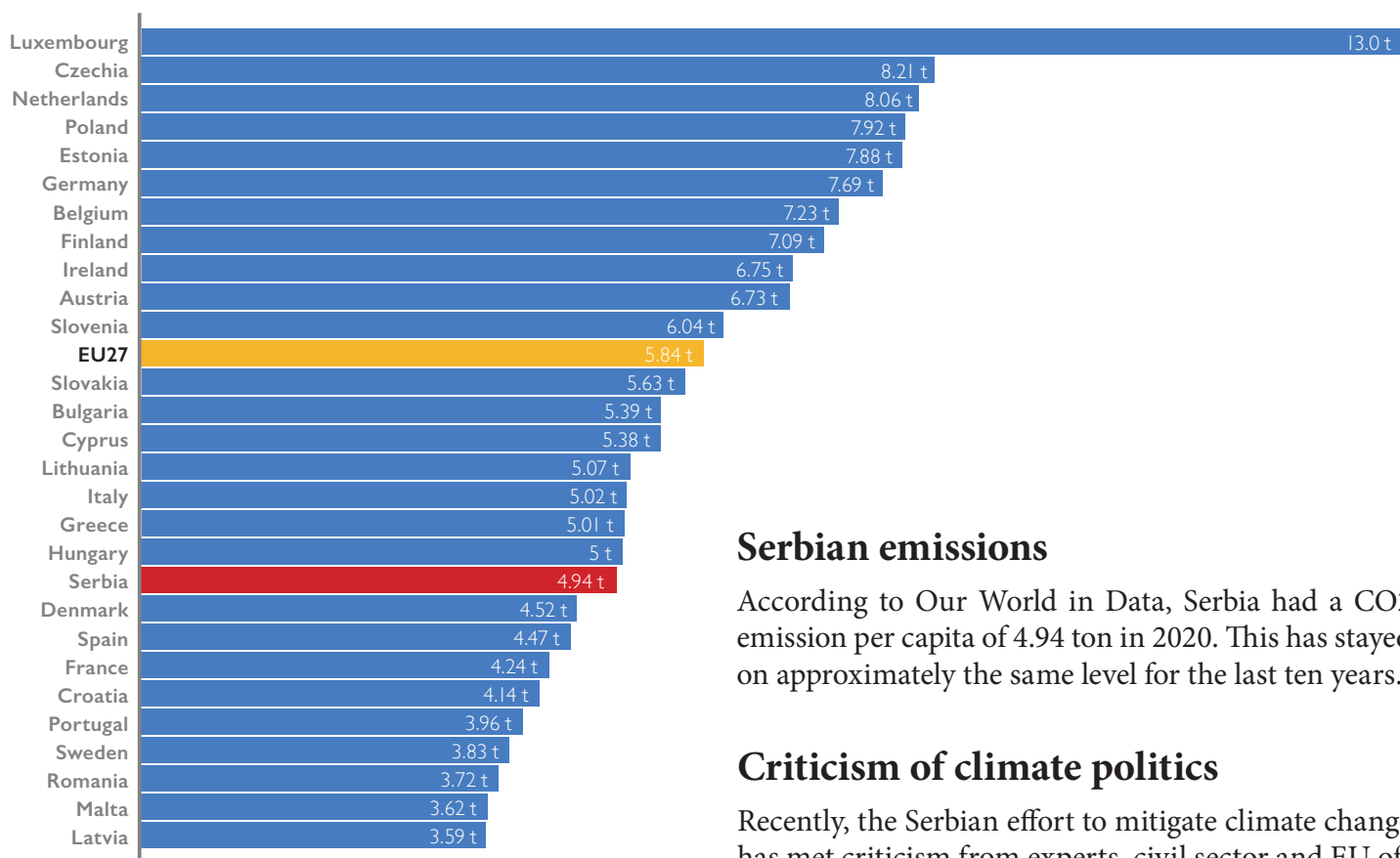
### **Law on climate change**

In March 2021, Serbia adopted the Law on Climate Change accompanied by certain regulations and new legislative opportunities for the green transition. The goal is to limit the concentration of greenhouse gases from power plants while developing renewable energy production programmes.

In the same month, the Ministry of Mining and Energy stated that the goal of the Serbian Government was to ensure that at least 40% of the energy came from renewable sources by 2040.

In addition, the purpose of the climate law is to monitor the amount of GHG emissions in the entire country and to ensure the availability of data regarding emission levels from power plants.

## Per capita CO2 emissions, 2020



*Carbon dioxide (CO2) emissions from the burning of fossil fuels for energy and cement production. Land use change is not included. Source: Our World in Data based on the Global Carbon Project.*

## Biennial Update Reports

The collected data from 2013 became part of the First Biennial Update Report from 2016. This included data on greenhouse gas emissions and a mitigation action plan developed by 2020.

The report outlined monitored GHG gases from different sectors. The energy sector accounted for 79.4% of the emissions, while agriculture, industry and waste emitted 19.6%. It also proposed measures to be taken to reduce the emissions.

However, most of the proposed measures have not yet been implemented. All in all, only a handful of actions and planned projects were realised from the 2020 mitigation action plan.

## Serbian emissions

According to Our World in Data, Serbia had a CO2 emission per capita of 4.94 ton in 2020. This has stayed on approximately the same level for the last ten years.

## Criticism of climate politics

Recently, the Serbian effort to mitigate climate change has met criticism from experts, civil sector and EU officials. A report from the climate NGO “Coalition 27” analysing the period of 2016 – 2020 concluded that the government of Serbia has not made significant progress in the climate area other than the adoption of the law and has not allocated sufficient funds to continue the green transition. Another critic is Antoine Avignon, the project manager of the Delegation of the European Union to Serbia.

»When it comes to the fight against climate change, Serbia lacks ambition,« he stated in an online panel debate entitled “Climate Action and COP26” in November 2021.

Accuses of transparency issues as well as misuse of resources reserved for climate activities are common amongst critics. These are backed up by reports from Transparency International. According to their Corruption Perceptions Index, Serbia ranked relatively low as number 96 out of 180 countries in 2021.

## Lack of financial resources

One challenge for the Serbian climate efforts is lack of financial resources for the green transition. Vladimir Vučković, a member of the Fiscal Council of Serbia,



claims that Serbia would have to invest 8.5-9 billion euros in environmental protection (including climate change) in the next five to ten years to meet the EU requirements.

In addition to the lack of funds, there is also insufficient infrastructure for green energy production. Approximately 70% of energy in Serbia is still obtained from coal used in thermal power plants across the country.

Apart from the negative effects on the climate, this form of energy production also causes massive air pollution and health problems for the citizens living nearby. It has been determined that Serbian thermal power plants are among the top 10 largest polluters in Europe.

## Lack of public awareness

Lack of public awareness of climate change is also a major concern. According to Vladimir Đurđević, a professor and climatologist at the University of Belgrade, relatively few people are interested in the issue, both in the general population and among researchers.

As we will see in the following sections, the awareness of the Serbian citizens has increased though. More initiatives are rising in the form of civil activism focused on climate change and pushing the Government of Serbia to take the necessary steps towards a greener economy.

However, there is no doubt that Serbia and all its citizens are facing a long and difficult journey.

[Click here for questions and exercises about this section](#)



*Credit: EC/ECHO/EEAS/EU Delegation BiH*

## PORTRAITS

In this section you can read about Serbian people who are engaged in fighting climate change in different ways. You can also watch the full interviews with English subtitles by clicking on the photos.



### **Nemanja Milović:** **It's also about opportunities**

Nemanja is a part of the NGO "Klima 101" which aims to raise awareness and educate the public about the causes, consequences and dangers that are related to climate change.

In the beginning, the biggest challenge for the organisation was the former lack of interest towards climate change. While reading long scientific texts on the topic, Nemanja started with the idea of making the texts shorter and simpler.

»Everything we do actually revolves around creating content that we publish on the site to educate people about these topics. To introduce them not only to the problems and challenges but also to the opportunities that are provided to all of us through the changes we need to make to stop climate change,« he says. Nemanja also hopes to inspire people to do something alone or to join a bigger climate movement and organisation.



### **Jana Cekić:** **I believe that anything is possible**

Jana is a first-year Bachelor of Science student. She is also the local coordinator of "EXITO TEAM" Niš - an activist club working to make a change in the community and encourage people to take action for the climate and the environment.

Exito originated as an idea in the city of Kuršumlija by four high school students who wanted to make a change in the community and encourage people to take action. For instance by removing trash from nature or raising awareness of pollution.

»Pollution is one of the problems we deal with a lot in Serbia because it's among the worst. I think this is the first in a series of larger steps,« she says.

Her team has had several successful projects so far. The most famous is "Oplaneti se, recikliraj". Here, they enriched high-school yards with seedlings and buckets, all aimed at raising environmental awareness.

In the future, she is planning to work together with other non-governmental organisations in Niš about projects on the environment and climate.

»I believe that anything is possible. I know a lot of ambitious young people and I feel that many of them want to change something and recognize the danger,« she says.





## Bojan Gajić: My role is to help raising awareness

Bojan has been the Energy Manager of the city of Niš since June 2019. He graduated from the Gymnasium “Bora Stanković”, and the Faculty of Mechanical Engineering in Niš. Bojan believes that his most important job is helping to raise citizens’ awareness.

»That’s where I see my role. Insisting on the importance of these topics and initiating city activities in the areas of energy efficiency and environmental protection,« he says.

Energy efficiency is a term that implies using less energy to get the same job done. That means, eliminating energy waste during consumption or operation. Bojan points out that we must work on improving the energy efficiency of our buildings, both private and public. For instance by changing the thermal characteristics of buildings and applying solar panels.

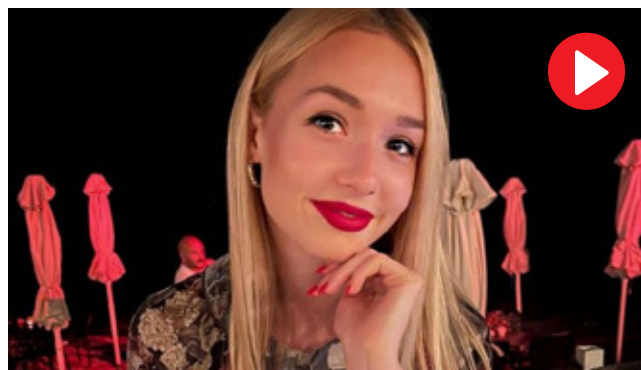
»The city of Niš is not that energy efficient if we compare it to various cities abroad. But if we compare it with other cities in Serbia, it is very much at the forefront of energy efficiency improvement.«



Coat of arms of Niš.

## Petrija Popović: Important to learn about resources

Petrija is an intern at E-Reciklaža, the biggest company in the field of electronic waste recycling in the Balkan region. For instance refrigerators which can be very harmful to the climate if not treated properly when discarded. When freon, the gas that fills old refrigeration devices, reaches the atmosphere, it irreversibly destroys the ozone layer and causes climate change.



»Our company releases freon using cutting-edge technology and this preserves the entire planet, not only the immediate environment in which we live,« she says.

The company has also held a three-day workshop with preschool children. The topic was recycling of toys that run on electricity and batteries.

»We believe that it is important for children to learn from an early age how valuable natural resources are and how they can be preserved through recycling.«



**E•RECIKLAŽA**  
Reciklaža električnog i elektronskog otpada

[Click here for questions  
and exercises about this section](#)

# NATIONAL INITIATIVES

All political agreements, reports and activities regarding climate change have so far played a minor role in Serbia. Some actions have been launched however. In this section we will take a look at national initiatives on different levels.

## Governmental level

### The Green Fund

In 2016 the predecessor to the Ministry of Environmental Protection established a Green Fund. It aims at financing all environmental protection projects in Serbia. Besides climate change, it deals with the protection and improvement of air, water, soil and forest quality.



**GREEN  
CLIMATE  
FUND**

It is funded through eco-taxes imposed on activities that pollute the environment as well as through donations and loans. Unfortunately, so far most of the money has been used for purposes other than environmental projects, for instance infrastructural projects.

A few relevant projects have mainly been related to recycling and foresting. In 2020, the city of Pirot acquired funds for a waste separation plant, and in 2021 the fund financed the reforestation in 38 municipalities.

### Green energy initiatives

Even though the climate politics has not had big impacts so far, Serbia has taken small steps in the effort to reduce fossil fuels in the energy sector and to increase the use of renewable energy. This primarily refers to solar and wind parks as well as the use of biomass as an energy source. There are nine wind parks and several solar parks in Serbia at the moment.

The wind farm Alibunar in South Banat opened in 2018. It enables the production of electricity for 38.000 households.



*Credit: Zbynek Burival, via Unsplash (CC0)*

In 2014, a solar farm was put into operation on an area of 13.600 square metres in the municipality of Klado-vo. It produces enough electricity for the needs of 10.000 inhabitants in this municipality.



*Credit: Andreas Gücklhorn, via Unsplash (CC0)*

In 2021, the Ministry of Mining and Energy, in co-operation with 37 municipalities, announced a public call for the installation of solar panels in households. The pilot project is trying to inspire citizens to add more energy-efficient products to their homes, and to use more renewable sources of energy in everyday life.



## Private business initiatives

A lot of small- and large-scale companies have incorporated sustainability and pollution reduction in their business policies as part of a corporate social responsibility (CSR). Moreover, some companies have also placed the issue of climate change at the centre of their investment strategies.

Some actions are more “concrete”. For instance, the company LafargeHolcim was the first to manufacture “green” concrete characterised by lower CO<sub>2</sub> emissions during production.

Another example is the construction of three “green buildings” in Belgrade, expected to be completed in 2022. They are built from wood and recycled materials and their main focus is on natural lighting. Also, rain-water was used for the construction, and green areas have been planted inside and around the buildings.

### The Alliance for Green Transition

In 2021, the Chamber of Commerce and Industry of Serbia formed the Alliance for Green Transition. It consists of a consortium of companies and the Government of Serbia. The goal is to lead changes in the field of “green” circular economy. The activities have so far included launching an interactive network platform of business entities (19 members at present). It has also presented examples of good practice and a review of the law from the perspective of the business entities. However, no concrete climate action has been undertaken to date.

### Financial support and loans

In order for Serbia to successfully join the fight against climate change, a legislative framework is not enough. Another necessary aspect is funding, which the country itself cannot fully provide. As a result, Serbia is taking loans from international financial institutions or establishing partnerships with them.

### Reconstruction and Development

In 2021, The Ministry of Mining and Energy signed a Memorandum of Understanding with representatives of the European Bank for Reconstruction and Development (EBRD). The purpose is to provide a framework for cooperation for the improvement of renewable energy sources and air quality. Moreover, the funds should enable the construction of hydroelectric power plants and new wind farms. The EBRD cooperates with the Ministries through the project of improving the irrigation system in agriculture. The lat-

est programme implemented by the Ministry with the help of the EBRD is a subsidy for households to achieve energy efficiency. It entails financial assistance for the replacement of windows and doors, heating systems, building insulation and installation of heat pumps in private properties. So far, 2,200 households have used this subsidy.

### United Nations

United Nations Development Programme (UNDP) offers its expertise and knowledge of climate projects and collaborates with the relevant Ministry. It also financially supports the realisation of projects in the field of climate change, mainly related to climate adaptation. Some of the projects refer to the establishment. All projects with UNDP involved are still active.



In section 6 you can read about some of the initiatives related to the European Union.

## Civil society initiatives

### Coalition 27

Coalition 27 is a project named after chapter 27 in the EU accession negotiations about the environment and climate change. It contributes to the process of harmonisation and implementation of the policies and regulations with the EU.

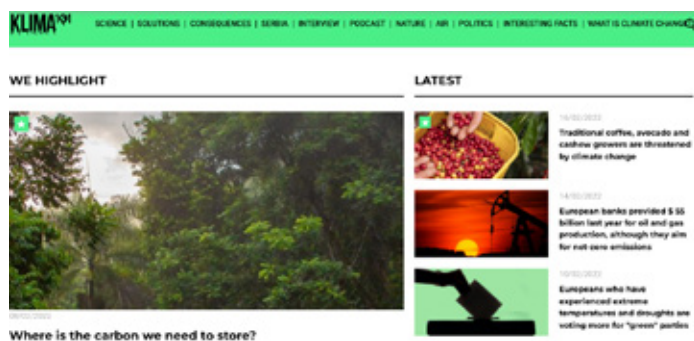


It produces a so-called “Shadow report on Chapter 27” which analyses the progress, success and failure of the government in achieving the goals, set by the Serbian government itself. As mentioned in the introduction, reports from Coalition 27 have so far not been very positive in that regard.

### World Wide Fund for Nature (WWF)

WWF works to preserve biodiversity and reduce the human footprint on natural habitats. It also fights against climate change by raising awareness, educating and supporting projects. So far, it has implemented a number of projects in Serbia. For instance, the “Climate Pact for Impact” aimed at informing young

people and citizens in Serbia on climate change. It also collaborates with companies in Serbia with a special focus on youth. These activities are implemented through workshops in schools with students who will later educate other young people.



### Klima 101

“Klima 101” is an NGO based on the website klima101.rs. Here, the members try to raise awareness of the climate crisis and to make sure that people are well-informed on the topic. It is a goal for the organisation to talk openly to everyone. Not only those who want to know more, but also those who believe that everyday human activities do not affect our climate. So far all

activities are located on the website but the organisation will soon present a physical office in Belgrade from where they will analyse the policy of climate change.

### Ekološki Ustanak

In April 2021, a nationwide environmental movement proclaimed an “Environmental Uprising” in Serbia. It has been gaining in strength and popularity ever since.

The movement was most powerful when it joined local protests against recent mining projects. The Serbian government had made deals with international lithium mining companies, and introduced a “Law on Expropriation” in this context. The law allowed the state to expropriate property from those not willing to sell if the mining projects were considered of “national interest”.

In December 2021, protests spread to more than 60 cities and towns across Serbia, with people symbolically blocking the traffic every Saturday at 2 pm. In the end, the Government had to withdraw the law and suspend all mining permissions for international companies.

[Click here for questions and exercises about this section](#)



Protests in Belgrade in December 2021. Credit: Oliver Bunic



# SERBIAN ENERGY MIX



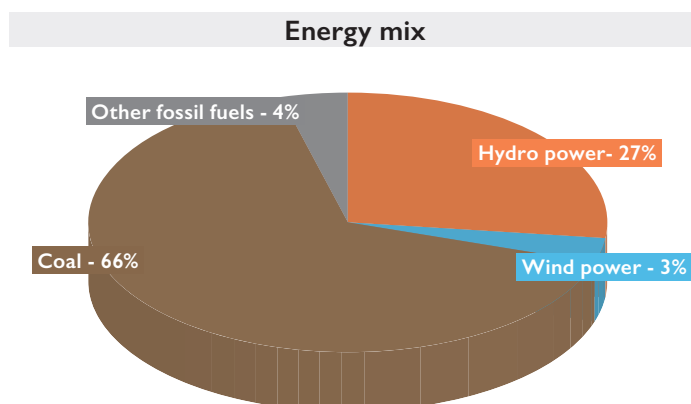
Coal mine in Serbia. Credit: [Max Pixel](#)

## Fossil fuels

Energy balances in Serbia show that 70% of the energy comes from fossil fuels, 68.6% of which is coal.

This is not only bad for the climate. Serbian cities are exposed to high levels of pollution for between 100 and 150 days a year.

According to research by Health and Environment Alliance (HEAL) from 2019 under the name of “Chronic Coal Pollution”, it has been determined that Serbian thermal power plants are among the top 10 largest polluters in Europe. As a result, Serbia has a large problem of excessive air pollution in cities, evident in increased concentrations of both GHG gases and PM particles.



The European Environmental Protection Agency has marked Serbia as a black area in Europe. Since 2017, the consumption of fossil fuels has been growing by 4 - 6% per year in 2018 and 2019.

In March 2021, The Ministry of Mining and Energy stated that the objective of the Serbian Government is to ensure that at least 40% of the energy comes from renewable sources by 2040. However, in 2021 Serbia constructed a new thermal power plant named Kolubara B.

## Renewable energy

### Hydropower plants

The average annual production of “Public Enterprise Elektroprivreda Serbia” hydropower plants is about 30% of the overall electricity production.

The company “Djerdap Hydro Power Plants”, accounts for about 18% of the overall energy potential in Serbia.

Even though the energy coming from hydropower is green, the hydropower plants have other negative effects on the environment. They are often built in protected natural areas, such as national parks and nature parks. A study from the Faculty of Forestry in Belgrade from 2018 (Ristić et al) made some disturbing conclusions. The construction of small hydropower plants fundamentally endangers the environmental protection, biodiversity conservation and stability of fragile ecosystems of hilly and mountainous areas.



Hydroelectric power station in Serbia. Credit: [MRY](#)

This has led to many protests around the country in recent years. Most commonly emerged locally protests in relation to specific construction projects but eventually on a national level, the protests culminated in 2021-22.

### Wind power

The first windmill in Serbia was built in the city of Novi Pazar in 2011. Earlier this caused voltage problems in this part of the municipality, but the situation has since stabilised.

The total capacity of installed wind generators in the world reached the value of about 650 GW in 2020. Only eight farms with a total capacity of nearly 400 MW have been built in Serbia since 2014. Two more are currently under construction, which would increase the total capacity of wind power plants to approximately 600 MW.



Source: Ulleo, via Pixabay (CC0)

### Solar energy

Serbia has enormous potential for the use of solar energy. Serbia has between 1.500 and 2.200 sunshine hours per year.

Lately, more industrial consumers are choosing solar power plants for their own consumption. A large number of companies in Serbia that operate in the industry of processing raw materials have switched to a complete power supply from solar systems.

The largest rooftop solar power plant in Serbia, a 1.1 MW plant with over 3000 solar panels, is located on the roof of Al Pack in Subotica.

[Click here for questions and exercises about this section](#)



## LOCAL INITIATIVES

In the last few years, Serbia has developed a growing eco-consciousness. Citizens are acting both as individuals and as part of movements with a common goal: protection of the environment and a fight against climate change.

There is a large number of smaller organisations in Serbia that deals with environmental protection through education, workshops, campaigns and actions. None of them focus exclusively on climate change though.

In this section, you can read about some of the informal citizen activist movements and local political initiatives.

### Initiatives by local governments

Local governments in Serbia are often responsible for municipal waste, protection against noise in the environment and building permit insurance. Furthermore, local governments issue regulations on green taxes, and energy efficiency. Certain activities are aimed at solving a local problem in collaboration with civil society organisations. The projects primarily refer to education, advocacy and informing the citizens. Overall,

very little has been done so far though. Projects do exist but are not being implemented. However, here are a few examples:

The city of Kragujevac has been taking positive steps in the direction of a green transition. These include insulation of houses and replacement of old heating systems with the installation of solar panels in three primary schools. This has led to a decrease in energy consumption by 30%. Moreover, two coal boilers were replaced by gas boilers in the city heating plants. While only saving small amounts of CO<sub>2</sub>, it has significantly reduced the amount of PM particles released into the air.

The municipality of Bogatić in Western Serbia has replaced coal with geothermal water for heating public institutions such as schools, kindergartens and municipal buildings. The hot water used for heating can be up to 75 degrees and comes from one of the two existing underground thermal water basins in this municipality.

The municipality of Priboj is building a heating plant running on biomass as an energy source which will be put into use in 2022.



*The city of Kragujevac is one of the green front runners in Serbia. Credit: Cmpyjajoe*

## Initiatives by local companies

### Renewable energy heating

The company Telefon-Inženjering from Zemun is working with the production of solar panels. As an example of good practice, they have installed solar panels on its 300 m<sup>2</sup> halls for buildings and water heating which has reduced electricity consumption by over 60%.

On Kopaonik, the most famous mountain and ski resort in Serbia, 20% of hotels use hot water from the ground. For instance the Hotel Grand uses ground-water from two wells and uses geothermal energy and heating pumps to heat the entire SPA centre within the hotel. The Hotel Club A has changed its entire heating system and installed a new one with geothermal probes and heating pumps so that the entire hotel is heated by geothermal water.



*Credit: CODIGO82*

### E-Reciklaža

E-Reciklaža is a company founded in 2010. It is the biggest in the field of electronic waste recycling in the Balkan region. It deals with the collection, transport,

storage, treatment and reuse of electrical and electronic waste. The company recycles 15,000 tons of waste annually. All in all, more than 100,000 tons of waste have been recycled during the years.

## Civil society initiatives

### Ne(da)vimo Beograd

The protest movement Ne(da)vimo Beograd has been actively organising protests against air pollution as well as addressing the lack of effort to fight climate change from the Serbian government. Ne(da)vimo Beograd estimates that 7,000 to 12,000 people die annually in Serbia from air pollution. The movement also advocates for better public transport and conditions for cyclists in order to reduce private car traffic that contributes to the emission of GHG gases and PM particles.

**“Odbranimo reke Stare Planine” (ORSP) Movement** (Let’s defend the rivers of Stara Planina) was founded in the 1980s. They primarily advocate for the ban on the construction of small hydropower plants on Stara Planina and the territory of Serbia because of their harmful effects on nature and the quality of life. They have also participated in the 2021 Eco protests aimed to prevent the opening of a lithium mine in the valley of the river Jadar. In recent years, the movement has launched campaigns for the use of solar energy, wind power and biomass energy for electricity production.

[Click here for questions and exercises about this section](#)



Protest organised by “Ne davimo Beograd”. Photo credit: Igor C/Flickr



## ROLE OF THE EU

Serbia began its journey towards the EU in 2009 and became a recognized candidate for membership in 2012 with accession negotiations formally beginning in 2014.

In order for Serbia to become a member of the EU, it needs to harmonise a large portion of its laws and policies with EU standards. This process began in 2015. To make the process more simple, all relevant sections (for instance trade, justice, human rights) are divided into 35 chapters. So far Serbia has successfully ended negotiations for two chapters and opened 22 additional chapters. Chapter 27 deals with the environment and climate change.



*Meeting On 15 November 2021 between Serbian Minister for Foreign Affairs, Nikola Selaković, and Věra Jourová, Vice-President of the European Commission in charge of Values and Transparency. Credit: Audiovisual Service*

### Opinions towards the EU

Various research agencies regularly analyse Serbian citizens' support for EU membership. The results of the latest public opinion poll in 2021, conducted by the Balkans Public Policy Advisory Group (BiEPAG), indicate that more than half of the citizens (53%) are in favour of Serbia becoming an EU member whereas 43% of the citizens are against it.

According to the same research, citizens who are in favour of EU membership believe that it would bring economic prosperity, higher salaries, better organised social welfare, a more intensive fight for environmental protection as well as strengthened rule of law.

Proponents think that the membership process is extremely complex and is taking too long. Some believe that Serbia is 20-30 years behind in the development process when compared to the current EU member states. Therefore, they believe that Serbia is not yet ready to live up to the required EU standards.

### Accession negotiations process

Following the opening of the negotiations on Chapter 27 about environment and climate change, the officials and Ministers were rather sceptical. It was presented as the most demanding and expensive one as it involves the largest number of infrastructure investments. Furthermore, public opinion is divided as to whether Serbia needs the EU to solve its environmental problems.

Some of the changes needed for EU membership include a reduction of the use of coal for energy production, a higher share of green energy, proper disposal and treatment of waste and construction of wastewater treatment plants.

The current Serbian objective of at least 40% energy from renewable sources by 2040 is not enough to meet the European Union and Energy Community policy. Their aim is to reduce non-renewable resources of energy and level up the green transition. Climate neutrality should be achieved by 2050, and fossil fuel power plants should be closed by 2030. Therefore, Serbia must soon find a way to replace energy production from 4,000 MW thermal power plants and build solar, wind and hydro power plants.

Serbia spends insufficient funds on green technology and environmental protection. This is justified by a lack of financial resources while claiming that the problems will be addressed in the future. The EU has so far financially supported some of the construction of the infrastructure necessary for a cleaner environ-



President of the European Commission in Serbia.  
Credit EC - Audiovisual Service

ment. For instance the EU has supported wastewater treatment systems, construction of a regional waste management centre and installation of air quality monitoring systems.

The EU has simultaneously been working on raising environmental awareness of the citizens so that they can become the initiators of sustainable changes in society. There are three EU Information Corners (EU-IPs) in the cities of Niš, Belgrade and Novi Sad, whose purpose is to inform the Serbian citizens about the EU.

They carry out activities such as training, presentations and workshops covering different issues, including, among others, climate change.

## Green cooperation

The Green Agenda for the Western Balkans, signed in 2020, is a new growth strategy that aims to assist the region towards a sustainable and green economy. The aim of the Agenda is to enable signatory countries to work together on securing funding. This should be used to:

- Increase the amount of energy obtained from renewable sources (wind, water, solar energy)
- Facilitate the transition to a circular economy (improving the sustainability of raw material production, prevention, reduction, recycling and management of waste)
- Reduce air, water and soil pollution and protect biodiversity and ecosystems.

In October 2021, an action plan was adopted. The EU promised several billion euro as financial aid for projects that would achieve the objectives. So far, nothing concrete has however been initiated.

[Click here for questions and exercises about this section](#)





# THE IMPACT OF FOOD WASTE

Do you ever think about what happens to the bio-waste we throw away during food preparation? Or to the uneaten bits we scrape from the plate once we have finished eating? How about the food we throw away because it has stayed in our refrigerators for too long? And, while shopping, do you ever wonder what happens to the food in stores after it has expired?

Almost 247.000 tons of food are thrown away in Serbia every year, which is 676 tons on a daily basis. This was revealed in the first official research on food waste in households in Serbia conducted by the

Centre for Environmental Improvement. On average, citizens of Serbia throw away about 35 kilograms of food a year.



*Credit: Rachel Claire, via Pexels (CC0)*

Food waste is not only a problem in Serbia. According to the World Organisation for Nature Protection (WWF), as much as one-third of all globally produced food ends up as waste. A large amount of food thrown away is not only a waste of money and resources, which could be used by people who really need it. It also has a negative effect on the climate as the process of producing, distributing and dumping food releases greenhouse gases into the atmosphere.



*Credit: bokel, via Pixabay (CC0)*

## The Youth Climate Forum

Food waste was one of the issues addressed at the first Youth Climate Forum in Serbia organised by the WWF. Here, young people aged 15-24 years presented their initiatives dedicated to mitigation and adaptation to climate change. Five youth initiatives were presented during the Forum. One of them was “Zajednički frižider” (The Shared Refrigerator) created by young Serbs.



*Credit: Alexas\_Fotos, via Pixabay (CC0)*

It is an ecological and humanitarian project that deals with the problem of excessive disposal of food and clothing and the negative effects on the environment.

The Shared Refrigerator initiative aims to reduce the amount of food that is thrown away, recycle and reuse clothes, help fellow citizens and raise environmental awareness. Their idea is to set up shared refrigerators and closets throughout Belgrade, the capital of Serbia, which will be accessible to everyone. Citizens will be able to leave food and clothes they no longer want. At the same time, citizens who cannot afford such necessities can take the food and clothes free of charge.

The Shared Refrigerator initiative is launched within the project “Na Mladima Klima Ostaje” (Climate Heroes: Youth Voices for Sustainable Living), which is committed to reducing waste and fighting hunger.

## Energy from food waste

How can we help the climate with food that has gone too bad? What about the raw material left after cooking such as vegetable peels and eggshells?

In Serbia, the food waste is thrown into regular garbage containers together with other waste. Only one percent of waste of biological origin is reused. The discarded food piles up in landfills which pose a major environmental problem in Serbia. As the food waste

rots, it releases CO<sub>2</sub> and methane into the atmosphere, which are the two gases that are the main contributors to global warming and have a negative effect on climate change.

By throwing away food, we are also throwing away energy, since each type of organic matter has its own energy value. You simply need to know how to utilise it. The company Eso Tron from Novi Sad has figured out just that. They first started by collecting edible oil remaining after food preparation from restaurants. All the oil collected by Eso Tron is processed and converted into raw material for the production of energy, such as electricity and biodiesel.

As the business has grown, they have developed technologies that enable them to process other types of food waste in the same way. The energy obtained is used for the production of electricity and heat. When we consume energy that is produced in this way, there is no additional pollution created. In this way, the processing of food waste simultaneously saves energy and reduces greenhouse gas emissions.

[Click here for questions and exercises about this section](#)



Credit: ShotRAV, via Pixabay (CC0)





# THE GREEN FUTURE OF SERBIA

Serbia has done relatively little so far in the fight against climate change and environmental protection. Serbia has accepted and signed certain international agreements, conducted analyses and reported activities directed by these agreements. Yet these activities tend to be done slowly and non-transparent. The lack of political will and financial resources as well as clear legal frameworks mean that only a handful of actions and planned projects from the 2020 mitigation action plan have been realised.

However, having signed the Paris Agreement on Climate Change, Serbia has after all committed to reducing greenhouse gas emissions by 9.8% in 2030 as compared to 1990. Serbia has also signed and acceded to international obligations primarily towards the European Union and must follow the marked path, especially now after signing the Green Agenda for the Western Balkans. After the COP26 summit in Glasgow, Serbia's representatives further agreed that GHG emission should fall to 33% by 2050 as compared to the 2009 levels.

## Green energy transition

In order to meet these obligations, Serbia has to introduce rapid changes. First and foremost in the energy sector, but also in other areas such as waste management and recycling, wastewater treatment and circular economy.

Serbia's energy system is based on coal utilisation, and so far there has been no political intention of suspending investments in fossil fuels. This was confirmed by the construction of the new thermal power plant Kolubara B in 2021. Therefore, Serbia will remain dependent on coal for quite some time even though it is one of the most problematic energy sources for climate and human health.

The transition to renewable sources of energy is a lengthy and costly process. Serbia will not only need financial support from the European Union but also the transfer of knowledge and experience from EU member states.

## Environmental awareness

For a successful green transition to really happen, we need to develop environmental awareness in Serbia. It is necessary to inform and educate the citizens on the importance of the fight against climate change. We need to make it clear that we can expect long-term benefits even though changes for the better cannot be achieved overnight. Everyone must be included in the process as even small contributions of a larger number of people can make a difference.

For a sustainable transition we also need to introduce a green economy and to establish joint participation of all relevant actors: the Government, civil society, private companies,, the academic and scientific community as well as international organisations.

There is a dose of optimism that Serbia will start working on the climate change problems more intensively due to the efforts invested towards EU membership and the harmonisation and implementation of EU laws. The fact that Serbia has recently adopted the Law on Climate Change and signed the Green Agenda for the Western Balkans seems to confirm this. Serbia's journey on the road to achieving its climate objectives is however going to be challenging, long and unpredictable.

[Click here for questions and exercises about this section](#)

# Introduction

## SPAIN

Without a massive effort to stop climate change, Spain would soon become a very different country. Madrid would get the same climate as present day Marrakesh in Morocco. In Valencia the entire El Perellonet beach would disappear. Water could reach the town of Solana, which is located almost 20 kilometres from the coast. Water would also threaten the Sevillian neighbourhood of Dos Hermanas due to the overflow of the Guadalquivir River.

These are some of the likely future consequences of climate change in Spain if not enough is done in time to tackle climate change. However, Spain is already suffering from the increase in numbers of extreme weather events. For instance, the storm Gloria led to major

flooding in January 2020, and the storm Filomena in January 2021 covered Spain in exceptional amounts of snow. Madrid had its highest 24-hour snowfall in 50 years, with over 50cm. As a consequence, 657 roads and ports were affected by the storm of which 133 were blocked by the snow.

### Climate Consequences in Spain

In the last four decades, the average temperature in Spain has already increased by approximately 1.8°C. The latest climate change scenarios by the State Meteorological Agency (AEMET) predict a rise in annual scale of maximum temperatures between 2 and



Spain covered in snow in 2021. Photo: Ramón Oria\_ Flickr



6.4°C. Mostly pronounced in summer, with the highest increase in the center of the country and less in the north and northwest. A similar trend is expected for minimum temperatures. There will be a decrease in frost days and an increase in hot days and longer heat waves. The amount of rain will also decrease in the last decades of the century. All this could be accompanied by widespread changes in wind speed and a further increase in extreme weather events.

A lot of the consequences will be connected. There will be more droughts due to increased evapotranspiration and reduced rainfall. This will lead to a reduction in water inflows to rivers and thereby a decrease in the availability of freshwater and a lower water quality in general. The lower availability of water will be simultaneous to a greater demand derived from the increase in temperatures. In 2050, around 27 million people will live in areas of Spain with scarce water resources - even if we manage to keep the global temperature rise at a maximum of 2 °C .

The rise in sea level can also cause extreme conditions, such as meteorological tides, changes in the waves and changes in water temperature. Marine ecosystems will be more vulnerable to climate change when they are also exposed to other pressures and impacts, such as pollution, urban pressure, and overfishing. The magnitude of these pressures is increasing the risk of extinction of marine species at an unprecedented rate.

**Nature, agriculture and urban areas**

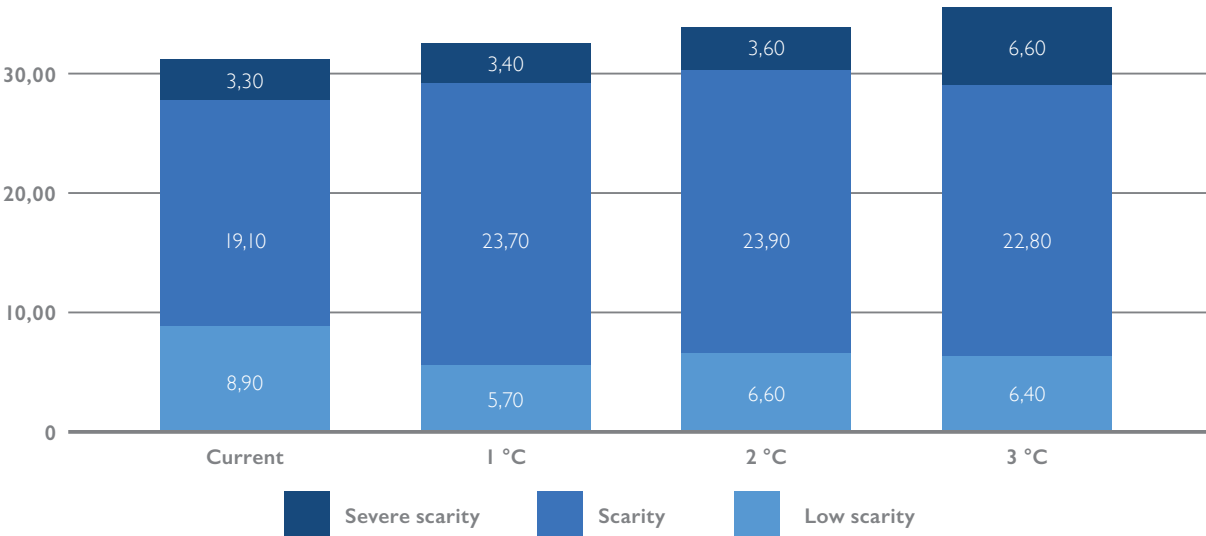
Spain is one of the three countries in the European Union with the highest risk of fires. The decrease in rainfall and the increase in extreme events such as droughts, floods or fire can also lead to a dangerous increase in erosion.

There will also be a decrease in organic matter in soils. This affects their ability to provide nutrients which would have negative consequences for forests and other natural areas. Furthermore, mountain ecosystems will be exposed to higher vulnerability as will reptile and amphibian species.

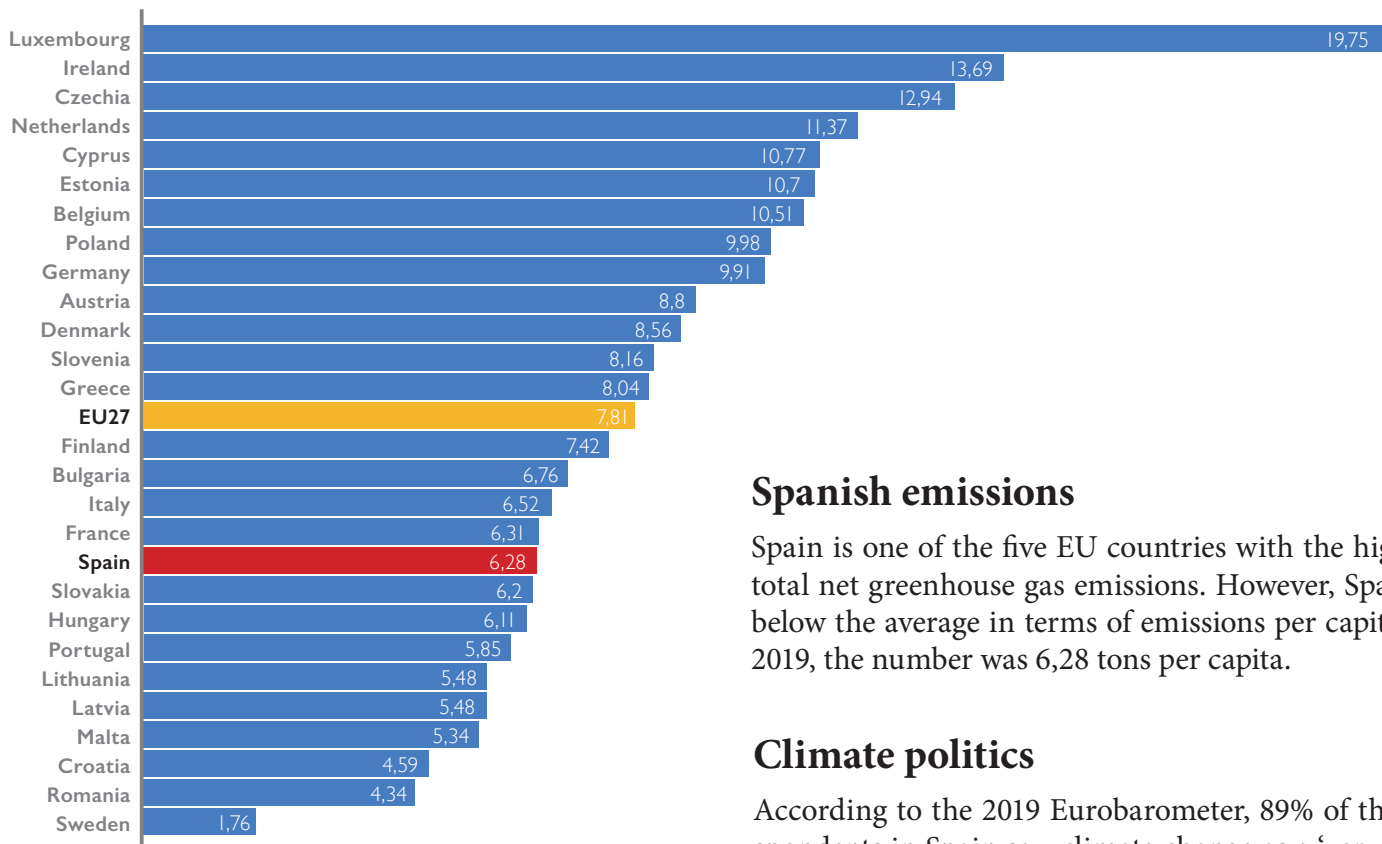
The main impacts in agriculture are associated with increased water stress, extreme heat damage and general changes in sowing and harvest seasons. The distribution of pathogens and diseases will increase. Fauna and pollinators such as bees may also be hit which will worsen the vulnerability of Spanish agriculture and livestock.

In the urban plans for adaptation to climate change in Spain, seven risk axes are identified which will affect human health and economy: rise in sea level, extreme waves, intense rainfall, decrease in rainfall, increase in temperature, heat waves and storms. The risks associated with excessive temperatures and floods are heart attacks, respiratory problems, and heat stress.

Million of people exposed to water scarcity in Spain due to climate change for different scenarios of temperature increase



## Total net emissions per capita - All greenhouse gases - (CO2 equivalent) with international aviation (2019)



## Spanish emissions

Spain is one of the five EU countries with the highest total net greenhouse gas emissions. However, Spain is below the average in terms of emissions per capita. In 2019, the number was 6,28 tons per capita.

## Climate politics

According to the 2019 Eurobarometer, 89% of the respondents in Spain saw climate change as a 'very serious' problem. This awareness has put pressure on the political system to act on the situation. In September 2019 the Plenary of the Congress approved a declaration of climate emergency in Spain. This was made into law on January 21st 2020, where the Council of Ministers approved the Declaration on the Climate and Environmental Emergency. The declaration is in line with the general consensus of the scientific community, which calls for urgent action to secure the environment as well as the health and safety of the citizens.

The agreement includes the development of 30 lines of action - five of them within the first 100 days - to face the climate crisis and take advantage of the social and economic benefits offered by the green transition.

Among the first actions, the Parliament submitted a bill that guarantees reaching net zero emissions by 2050 at the latest. This includes the promotion of:

- a 100% renewable electricity system
- an increase in private cars and commercial vehicles with zero CO2 emissions
- a CO2 neutral agrarian system
- a fiscal, budgetary and financial system compatible with the necessary decarbonisation of the economy and society.



Por el planeta, por nuestro futuro, por las próximas generaciones. Desde hoy, España cuenta con una [#LeyDeClima](#) sobre la que construir con decisión un futuro verde, sostenible, justo y próspero para todos/as. Gracias a quienes han trabajado incansablemente para hacerla realidad.



Transición Ecológica y Reto Demográfico

4.37 PM - 13. maj 2021 - Twitter Web App

*"For the planet, for our future and for the next generations. From today, Spain has a climate law on which to build a green, sustainable, fair and prosperous future for all." Tweet from the Spanish Prime Minister, after the approval of the climate law. Screenshot from Twitter.*



## Climate Change Law

In May 2021, the first Climate Change Law And Energy Transition Law in Spain was approved with two clear objectives: The reduction of greenhouse gas emissions by at least 23% in 2030 compared to 1990 levels. An objective that will, however, be revised periodically from 2023. Secondly, the achievement of so-called climate neutrality by 2050.

To achieve these objectives, the energy from renewable sources in final energy consumption will have to become at least 42% over the next decade (currently only 20%). Likewise, the electrical system will have to produce at least 74% energy from renewable sources (compared to the current 40%).

Among the most notable measures is the prohibition of offshore oil and gas prospecting in Spanish waters and a plan to close coal-fired power plants no later than 2025. Current legislation prohibits all new prospecting for coal, gas and oil with immediate effect. In addition, the law incorporates a ban on the sale of newly produced fossil fuel vehicles by 2040.

## Criticism of the law

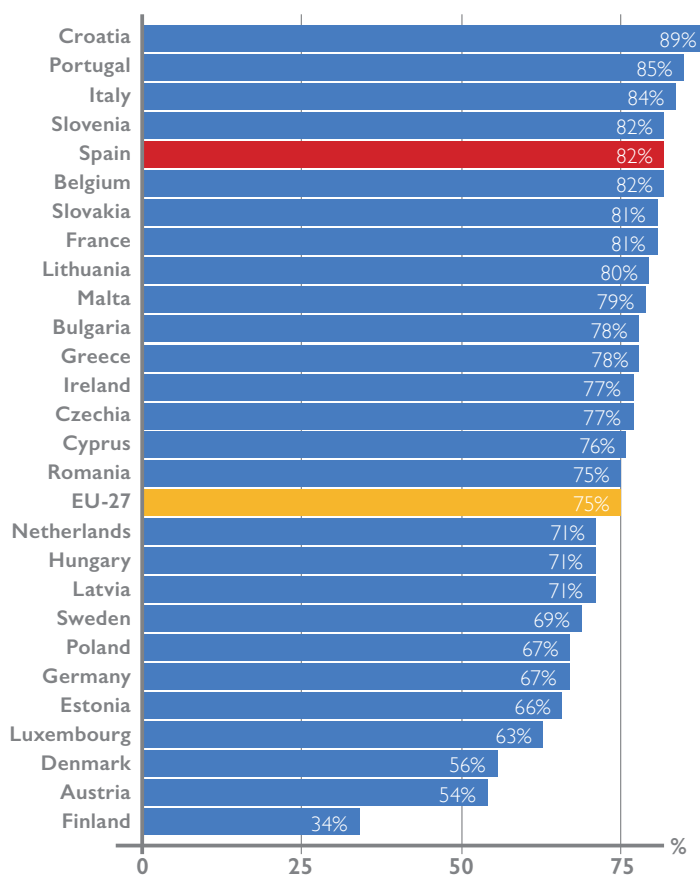
The climate law has led to strong criticism from civil society for very different reasons. Climate experts, activists, NGOs and green parties have been criticising the low ambition of only 23% reduction by 2030. Currently, it is below the 55% objective set by the European Union - as well as higher ambitions of other countries such as 65% by Germany, 68% by the United Kingdom and 70% by Denmark. As we see later in the chapter, some Spanish NGOs have filed a climate lawsuit against the Government of Spain due to the lack of ambition of the current plans to combat climate change effectively.

Another strong opinion is towards the construction of renewable energy sources necessary to reach the objectives. According to the law “it must be carried out in a way that is compatible with the conservation of the natural heritage and proper territorial planning”. However, it is still creating a lot of conflict in rural areas - places also referred to as “the emptied Spain” due to increasing depopulation during the years. Under the slogan “Renovables sí, pero no así” (“Renewable yes, but not like this”) numerous platforms and local organisations have been protesting against the energy model. They believe that it does not take into account

the impacts associated with the landscape and biodiversity.

In the Eurobarometer survey from spring 2021, 82% of the Spanish participants say that their national government is not doing enough to tackle climate change. So far there has been no official political response to meet these critics. The government believes that its commitment is ambitious - or at least as ambitious as it can be. No matter what, policies will have to be followed by public support and actions. In the following sections you can read about Spanish citizens and organisations doing their part to tackle climate change.

**Percentage of respondents who think that their national government is not doing enough to tackle climate change.  
Eurobarometer, Spring 2021.**



[Click here for questions and exercises about this section](#)

# PORTRAITS

In this section you can read about four people who fight climate change from different areas in the Spanish context. You can also watch the full interviews with English subtitles by clicking on the photos.



## Luis González Reyes: Citizens promote the transition

Luis González Reyes is part of the Garúa Cooperative which facilitates activities focused on eco-social transitions. They work on training (from school to university) and research - such as how to make transitions towards sustainable economies that benefits employment.

Garua also facilitates business-friendly projects that reverse the priorities of the conventional economy. For instance on cooperation rather than competition. With focus on social rather than economic profitability. And all of this in respect for the environment and with strong ecological commitments.

»Politicians have the ability to implement budget policies, legislation or policies that facilitate the transition. But those who can and have to promote the transition are the citizens and the civil society,« he says.



## Carlota Mateos: Hotels should be part of the solution

»The third world war will be about water.« Carlota Mateos still remembers at a young age reading this headline on the cover of a magazine. The message shocked her deeply and was her first awareness of the scarcity of water as a natural resource and how this was going to create enormous tensions in the world.

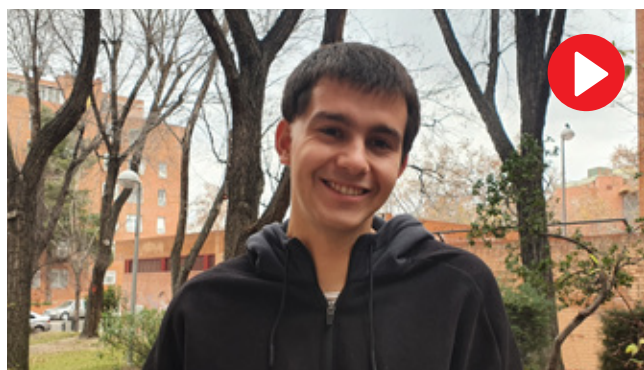
At the age of 19, Carlota created a company for hotels oriented towards sustainability in rural Spain. The fact that people live and work in rural areas means fewer fires, prevents desertification and protects water resources among many other valuable benefits. That is why generating economies in rural areas that are not intensive agro-industrial activities is so important, she says.

»In the areas of tourism and food production, there are powerful lobbyists who are not interested in the green transition at all. But if we want the hotel sector in our country - which accounts for 13% of GDP - to stop being part of the problem and to become part of the solution, it has to be remade from top to bottom,« she says.



## Diego Fernández: The climate crisis is happening now

Diego Fernández is 21 years old and lives in Madrid. The year 2019 was the time he became aware that he had to do more than recycle. With the climate mobilizations taking place around the world and the “Greta Thunberg boom”, he understood that climate change was something really important that was personally going to affect him and his future. Therefore he got involved in climate activism by joining the youth organization Juventud x el Clima.



»Juventud x el Clima demands from our governments, our companies and our politicians urgency in action. The climate crisis is happening now, not 10 years from now. They are stealing our future and it is not something metaphorical. We demand that they listen to science and realize the urgency to act,« he says.

If Covid has taught us anything, it is about the will to act when we have to. When something is truly seen as an emergency, there are mechanisms for the necessary measures to be taken. According to Diego, the same should be the case when it comes to climate emergencies.



## Miriam Campos Leirós: We need structural changes

Working as a teacher, Miriam Campos Leirós realised that children were able to recognize commercial brand logos sooner than various species of trees or birds. From that awareness she became concerned about the decline in nature knowledge in the public.

As a part of #TeachersForFutureSpain she now works on making nature trips into an integrated part of the school day and to include climate and environmental issues in all subjects in the classroom. For instance, in the mathematics subject they work on calculating the CO2 emissions from imported food compared to locally produced food. And in the language subject, essays are drawn up on the different carbon prints of fast changing fashion vs. slow wear in the textile industry. Furthermore, the organisation facilitates activism towards the wider public in Spain.

»It is necessary to carry out a massive campaign to all citizens so that they can understand the situation we are in. The measures that have to be taken should not be interpreted as a sacrifice but as an investment. We need structural changes in our way of life and this can only happen if the citizens are well informed,« she says.

[Click here for questions  
and exercises about this section](#)

# NATIONAL INITIATIVES

As the awareness of the climate situation increases, there is a higher demand from citizens for the necessary changes in our society. Politicians, the private sector and civil society are putting their efforts into changes towards a green future on different levels. In this section you can read about some initiatives developing in Spain to fight climate change.

## Climate trial

In 2020 a list of Spanish NGOs filed a climate lawsuit against the Government of Spain. The main claim is that it is violating the fundamental rights of present and future generations due to the lack of ambition of the current plans to combat climate change effectively.

Some examples of the organisations are Youth for Climate, Fridays for Future Spain, Ecologists in Action, Greenpeace, Oxfam Intermón and the Coordinator of Organisations for Development. Representatives of these organisations, accompanied by two lawyers who are in charge of the judicial process, formalised their participation in this Climate judgement in the Supreme Court.

The Spanish government later tried to have the case dismissed due to the climate policy already adopted in the Spanish legislation. In September 2021, the Supreme Court rejected the appeal as the government has still not fully complied with the content of the Paris Agreement.



*Representatives of Fridays For Future and Coordinator of Organisations for Development with the lawyers of #JuicioPorElClima in front of the Supreme Court. Photo: Coordinadora de ONGD.*





Climate protest in Barcelona in 2021. Credit: Ilias Bartolini, Justicia Climatica.

## Climate march

Under the slogan “Justice for the climate”, young Spaniards have taken up the cause in support of the first climate lawsuit against the Government. In 2021, the protesters invaded the streets after 1.5 year of not being able to mobilise due to the covid-pandemic. The protests were part of the worldwide climate event with more than 1500 locations around the world.

In Spain, marches took place in 16 cities organised by the Fridays for Future movement (Youth for the Climate). In Madrid, the protesters marched to the doors of the Supreme Court. The protesters carried banners with messages such as “climate cannot wait” and “whoever governs climate must be defended”.

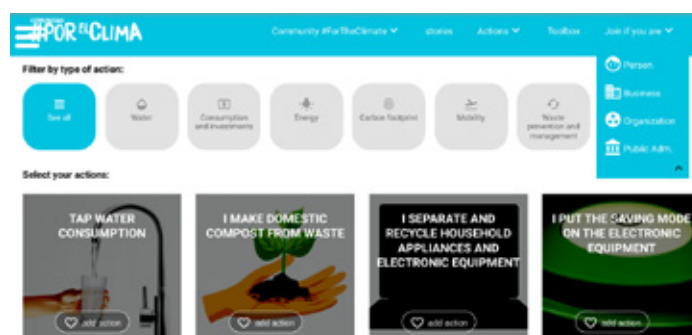
## Citizen Assembly for the Climate

The green transition can only be possible if all possible agents of the society get involved. Therefore, the Spanish Ministry for the Ecological Transition and the Demographic Challenge (MITECO) has launched the Citizen Assembly for Climate. On December 11, 2021, the first meeting took place.

One hundred people participated in the assembly with exercises to generate reflection and collective knowl-



edge. Finally, the assembly sought to generate consensus on the solutions to achieve climate neutrality before 2050 and to make Spain more resilient to the impacts of climate change in a fair and supportive way. The outcome of the meeting will be published in April 2022.



## #PorElClima Community.

Another initiative that works on combining different agents in the search for solutions is #PorElClima Community. It is a social network in which more than 22.000 people work together to accelerate climate action in the sectors of public administration, business and citizens. The website porelclima.es is the meeting place for the most innovative and proactive companies, entities, public administrations and civil pioneers already fighting for the climate.

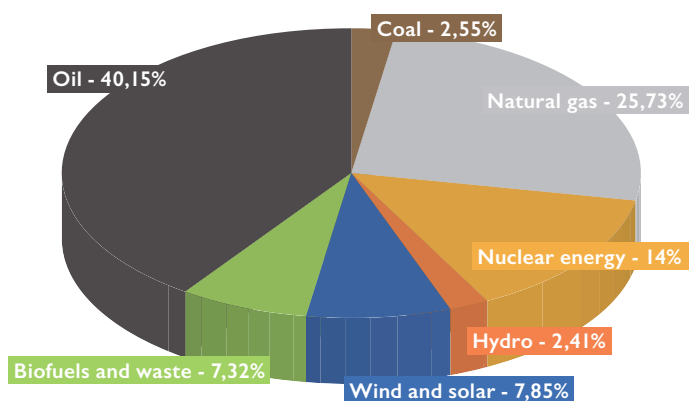
On the platform, there are eight different areas for adding actions: water, sustainable investment, consumption, energy, carbon footprint, mobility, zero waste and adaptation. The platform also contains a huge information archive of more than 400 reports, good practices, platform videos and ideas to help the user to act on actions addressed to climate mitigation and adaptation.

[Click here for questions and exercises about this section](#)

# SPANISH ENERGY MIX

Spain's total energy mix is still heavily dominated by fossil fuels (around 75%). Nuclear power accounts for 14% while renewable energy of hydro, wind and solar energy only accounts for around 10%. During the last decade, all coal mines are in the process of closing and the share of renewables in the electricity sector has increased considerably.

**Total energy supply (TES) by source - Spain (2020)**



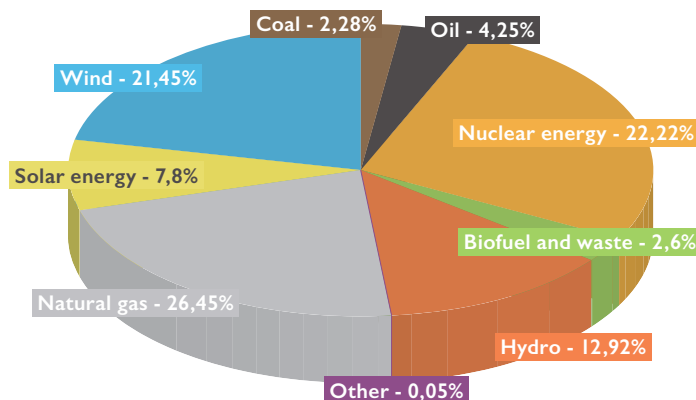
The National Energy and Climate Plan (NECP) 2021-2030 has set an objective of increasing the weight of renewable sources in the energy mix. According to the plan, Spain should reach 74% of electricity generation from renewable energy sources in 2030, as well as 42% of renewables on final energy consumption in 2030 (from 18.40% in 2019 and 8.3% in 2004). This is equivalent to an increase of 24 percentage points in the next 10 years, more than double what has been observed in recent years. (source: SDS)

## Renewable energy

In 2019, Spain installed more onshore wind energy and solar energy installments than any other EU country. Today, Spain is the fifth country in the world when it comes to installed wind power and the ninth in solar energy.

In 2020, renewables represented 43% of total electricity generation compared to 20.7% in 2007. In spite of this, the use of fossil fuels in the Spanish electrical system continues to be high.

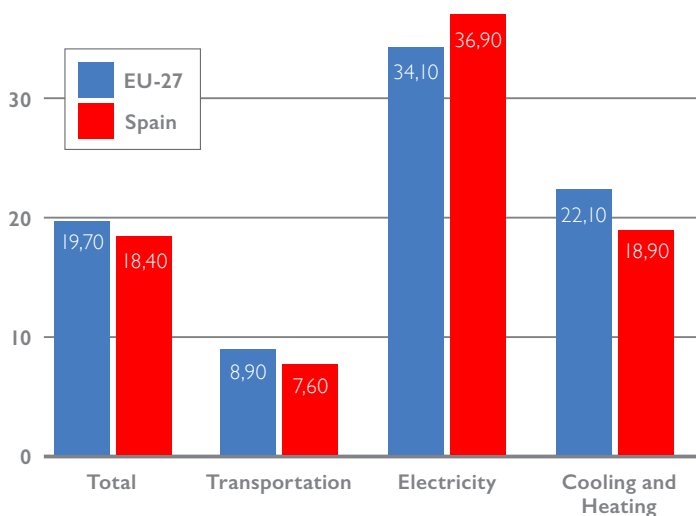
**Spanish electricity generation by source (2020)**



Spain has a negligible amount of oil reserves and produces very small amounts of crude oil and condensate. Since Spain lacks domestic petroleum resources, it imports virtually all of the oil needed to meet its demands.

Currently, Spain's degree of energy dependence is almost 75%. The European average is approximately 56%. This makes Spain the seventh European country most dependent on foreign energy for its energy supply.

**Weight of renewable energies in final consumption, by sector. Spain and EU (2019)**



[Click here for questions and exercises about this section](#)



## LOCAL INITIATIVES

Local initiatives to mitigate climate change play a fundamental role in achieving global climate objectives. A term being used in Spain to define these actions is “glocal”. These are actions that take place locally but have a global effect on reducing the impacts of climate change. In Spain there are several examples of local initiatives.

### Energy communities: Luco de Jiloca

In Spain, many efforts are being made towards the green energy transition. However, many of these are based on macro-projects for the production of energy many kilometers from where it will be consumed. Using cultivable fields for the installation of solar panels and wind turbines combined with power cables has a significant impact on landscapes and territories.

To avoid making mistakes in the implementation of new green energy systems and to propose a responsible use of renewable energies, the rural energy community of Luco de Jiloca arose. The main idea is to produce electricity consumed where it is generated.

The project, started by the people of the town, is going to install a solar garden of about 500 square meters, near Luco de Jiloca. It will contain about 100 solar panels from which 60 kW of power will be obtained. This can supply around 26 families as well as municipal buildings in the area and a garden center. This collective installation of renewable energy will avoid the emission of 23 Tm of CO<sub>2</sub> into the atmosphere annually.



Solar panels near Luco de Jiloca.

Credit: Sociedad Cooperativa Luco Energía

### Urban Gardens: Madrid Network

As citizens in our society we must become aware of the big problem of environmental pollution and try to help as much as possible. One solution is urban gardens which are a very useful tool for improving air quality and temperature in the city. According to the United Nations' Food and Agriculture Organization (FAO), urban gardens can actually be more efficient than traditional farms, producing up to 20 kg of food per year per m<sup>2</sup>.

The Madrid Urban Garden Network is an initiative promoted by citizens dedicated to community agriculture. From a local perspective, they look for solutions connected to the food system that allow them to supply themselves with healthy, fair and sustainable food.



Urban garden in Madrid. Photo: Alberto Peralta

One of the objectives of the network is to create a meeting point between community agroecology initiatives in their city and a more sustainable city model. This includes issues such as environmental education, food sovereignty, shorter distribution channels, consumer groups, sustainable mobility and agro-composting.

Urban gardens can offer an improvement in food quality and encourage the rapid growth of fruits and vegetables. When placed in a certain distance from car traffic, they are fresher and with less chemicals compared to conventional farming.



*Electric car charging in Catalonia.*

## Sustainable mobility in the cities

Som Mobilitat is a non-profit consumer cooperative in Catalonia that offers mobility services and products to accelerate the transition from the current model (based on the private vehicles with fossil fuels) towards a sustainable model. Its main service consists of renting electric cars through a digital platform. However, it can also be used for ride-sharing as well as sharing of bicycles and motorcycles. Despite being based in Barcelona, the company also participates in a network of mobility cooperatives in Europe called REScoop Mobility.

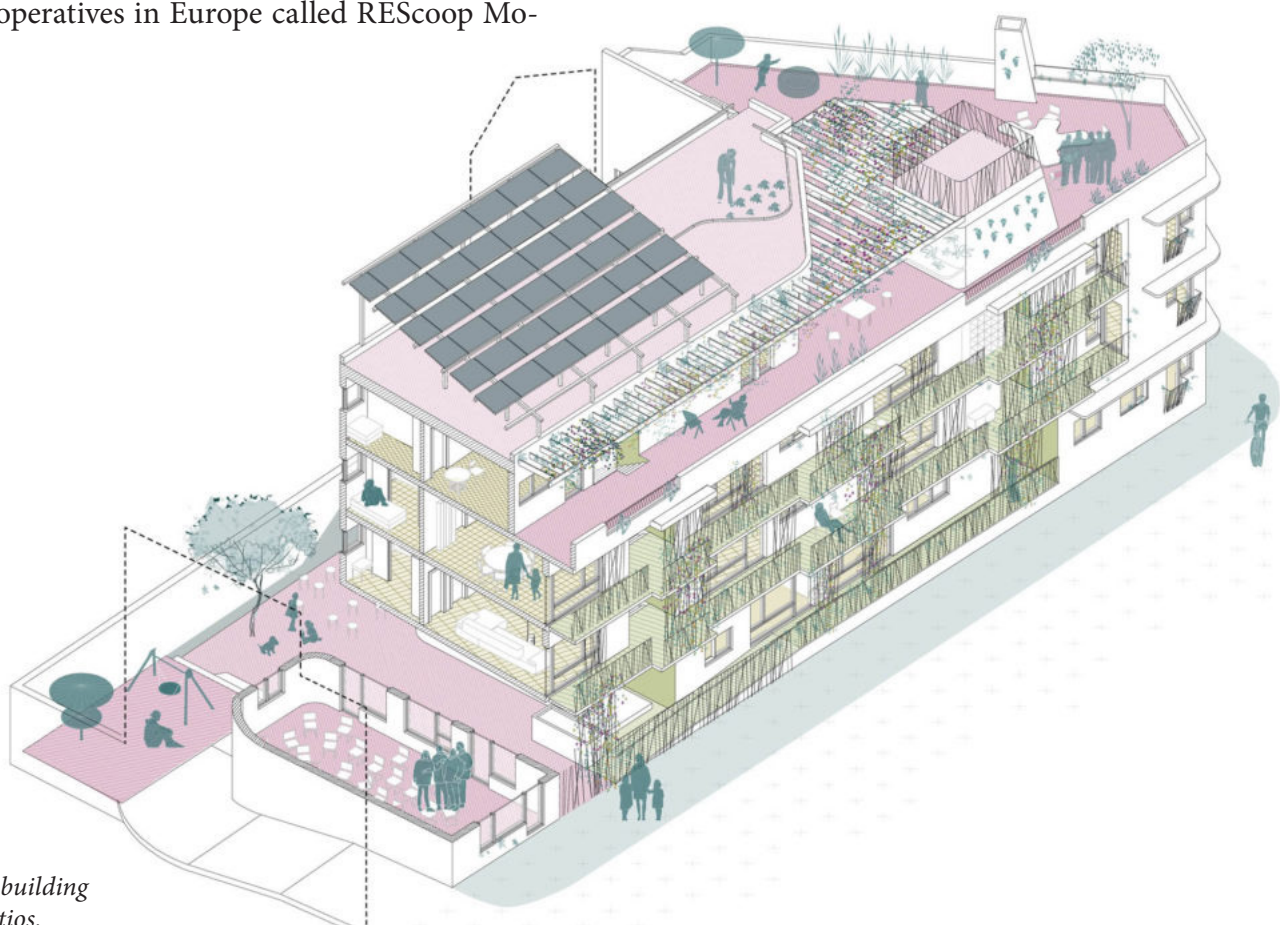
## Sustainable Homes: Entrepatrios

Entrepatrios is a “right-of-use housing cooperative” that aims at building alternatives to the speculative real estate market with social and environmental criteria. The people living in the buildings are all part of the cooperative and have the right to use the flat, while the ownership still belongs to the cooperative.

Furthermore, the commitment for construction is for buildings with almost zero energy demand besides what can be produced by itself. Besides the production of renewable energy, it focuses on reuse of water and the use of ecological materials.

One building has already been built and inhabited by 17 households: 32 adults and 20 children. There are three more buildings in process in Madrid. The cooperative is also working together with other similar projects in Spain to promote these kinds of initiatives.

[Click here for questions and exercises about this section](#)



*Drawing of a building from Entrepatrios.*



## ROLE OF THE EU



*The President of the Government, Felipe González, signs the Treaty of Accession of Spain under the watchful eye of King Juan Carlos I.  
Credit: Spanish Ministry of Foreign Affairs*

From 1939 to 1975, Spain was subjected to a dictatorship until the death of the dictator Francisco Franco. The following Government of President Adolfo Suárez officially requested accession to the EEC on July 26th, 1977.

The Spanish aspiration was accomplished eight years later - on June 12th, 1985 - with the signing of the Accession Treaty in Madrid. The entry of Spain into the Economic Community was perceived as a guarantee of democracy and a protection against a possible setback to authoritarian policies by sectors related to Franco. The effective integration into the EEC was on January 1st, 1986.

### Spanish citizens and the EU

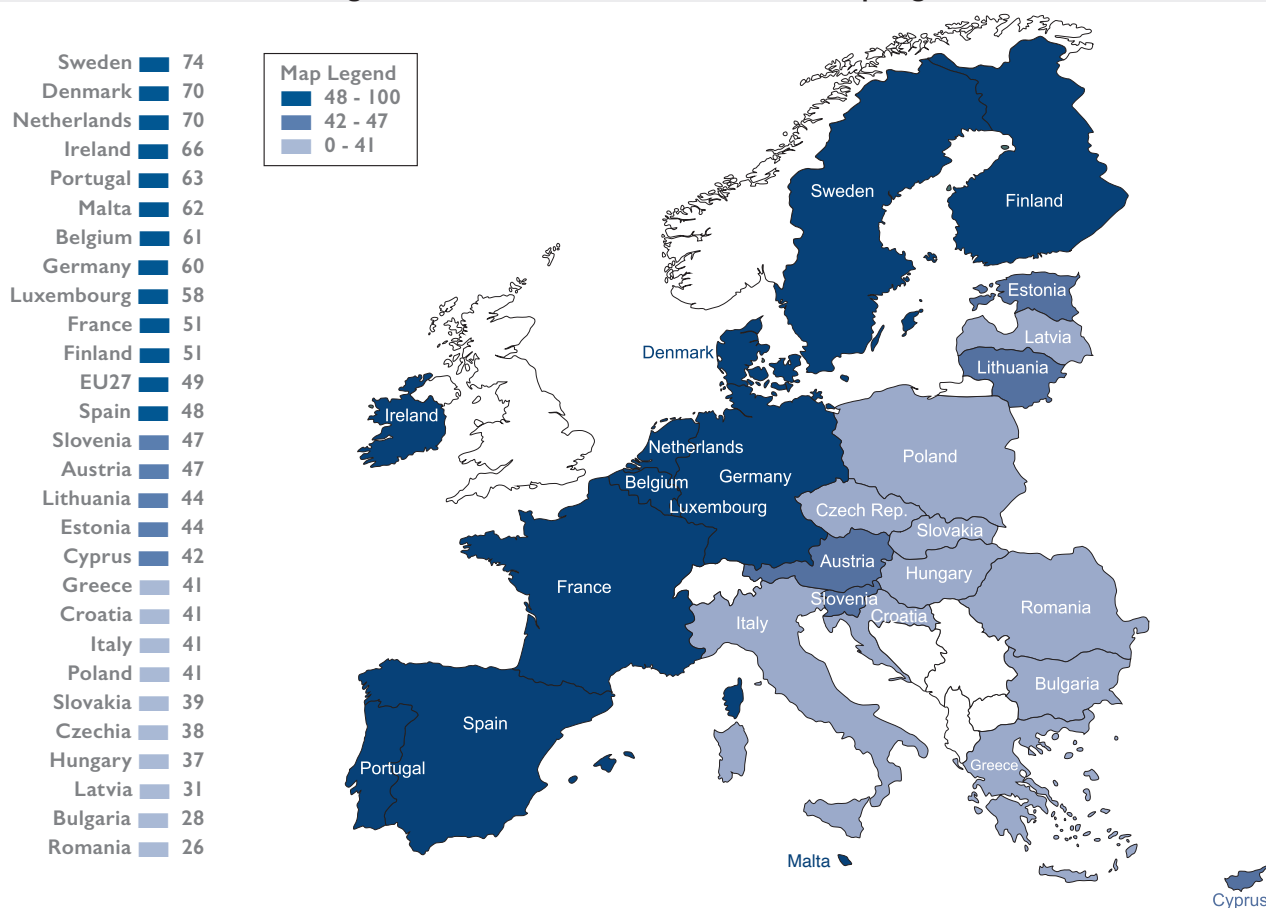
Unlike other EU member states, there has only been one referendum in Spain in which the citizens had to take a stand on their EU membership. In 2005, a consultative referendum on ratification of the Constitution for the European Union was approved by 76.30% of the votes. This was a considerably high number in

comparison to similar referendums in other member states. However, the turnout of the referendum was only 41.8%, which is the lowest participation in any democratic election in Spain.

Today, the Spanish turnout is above average among EU member states when voting for the European Parliament elections every fifth year - even though it is highly variable from one election to another. In 2019, 60.7% of potential Spanish voters participated in the election - 16.9% more than the election in 2014. Spain has 59 members of the European Parliament out of 705 members all in all.

In an EP-survey from spring 2021, 70% of the Spanish respondents indicated that they believe that the membership of the EU is generally a good thing. Only 5% said that it is a bad thing, while 23% said that it is neither good nor bad. However, 46% answered that they are rather in favour of the EU - but not the way it is working at present. Also, 89% say that EU citizens' voice should be taken more into account for decisions related to the future of the Union.

**Percentage of respondents who consider climate change as one of top four most serious problems facing the world as a whole. Eurobarometer, Spring 2021**



*Respondents in Spain are more likely than other EU citizens to agree that increased public financial support should be given to the transition to clean energies (95% vs the EU average of 81%), and that adapting to the impacts of climate change can have positive outcomes for citizens (79% vs the EU average of 70%).*

## Climate change and the EU

According to Eurobarometer, almost nine in ten respondents in Spain saw climate change as a ‘very serious’ problem (89%) in 2019, significantly above the EU average of 79%.

However, In spring 2021, only 48% of the Spanish participants considered climate change to be one of the four most serious problems facing the world. In the meantime health and economic issues had taken over as more serious problems.

## Spanish and EU climate ambitions

The objective set out in the European Green Deal for Europe’s economy and society to become climate-neutral by 2050 includes the target of a 55% cut on GHG emissions by 2030 for the European Union as a whole. While some member states have been reducing their emissions since 1990, Spain did not manage to make

reductions until 2020 due to the closure of the economy during the pandemic. This means that some countries have set similar objectives or even higher than 55% for 2030, while Spain is currently setting a 23% cut in its new climate change law.

The Next Generation Funds and the Recovery and Resilience Plan from the EU will probably be decisive for the Spanish climate politics in the years to come. Some of these funds are already a part of Spanish climate planning. Especially the Sustainable Mobility Law with the new regulatory framework for the promotion of electric vehicles. Other areas are a new Water Law, a National Strategy for Self-consumption as well as the development of local energy communities.

[Click here for questions and exercises about this section](#)



# BECOME AN AGENT OF CHANGE!

Everyone can and must be part of the solution when it comes to fighting climate change. There are many actions that we can carry out in our everyday life to reduce greenhouse gas emissions. In this chapter we propose you to lead some of them in the area of fashion. Because like eating, dressing is something we do on a daily basis.

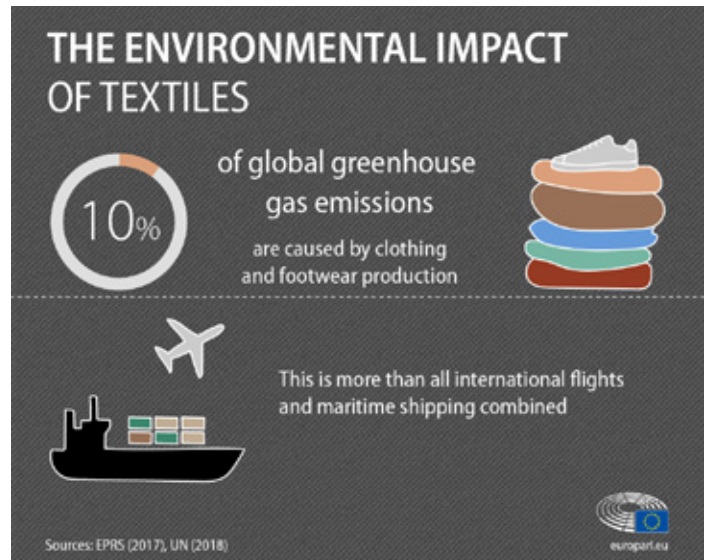
The textile industry is one of the biggest polluters and the production is often built on exploitation of the poorest people in the world. More clothing is being produced, consumed, and thrown away than ever before which puts an immense pressure on our planet. The production of clothing and footwear is responsible for 10% of greenhouse gases - more than all international flights and maritime shipments combined. In the EU, the fashion sector generated emissions equivalent to 654 kilo CO<sub>2</sub> per person in 2017.

The “fast fashion” is worsening the problem by stepping up the pace of design and production. Collection launches are no longer seasonal; the replacement of clothing stocks has become much more frequent. In this section we suggest what you can do to become an agent of change that pushes for changes in the fashion industry.

## Step 1 - Become aware

First of all you need to find the information needed to understand the extent of the problem.

For instance you could have a look at [this infographic](#) on the impact of textile production made by the European Parliament.

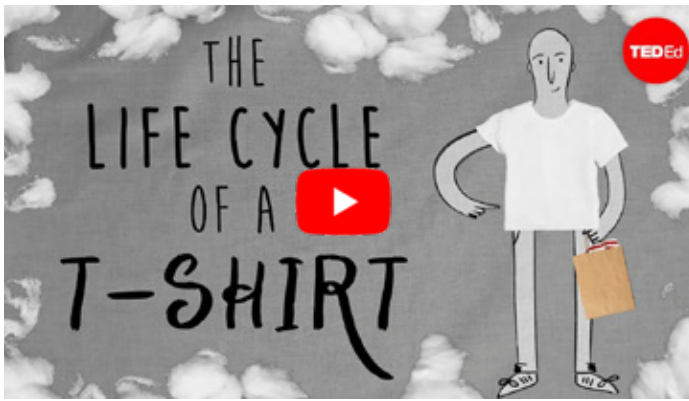


And [this briefing](#) from the European Environment Agency.



Demonstration against the climate impact of the fashion industry. Credit: Stefan Müller

You could also watch a few videos about the issue:



*The life cycle of a t-shirt (6 min video)*

In addition to this, here you have a quick list of not so fun fashion facts from the UN:

- The fashion industry is responsible for 20% of total water waste globally
- According to estimates, fashion could be responsible for a quarter of all carbon emissions in 2050.
- Every second a quantity of textiles equivalent to a garbage truck is buried or burned
- Every year half a million tons of microfiber are thrown into the sea, which is equivalent to 3 million barrels of oil.
- Clothing production doubled between 2000 and 2014
- 7500 litres of water are required to produce a pair of jeans
- The clothing sector uses 93 billion cubic metres of water each year, enough for 5 million people to survive.

### **Step 2 - Evaluate the actions that can be carried out**

Now that you are an expert in the climate consequences of the fashion sector, you can think about how to change it.

#### *Reduce consumption + buy second hand*

The reduction of consumption is a fundamental action in the fashion sector. We buy, use and underuse a large part of the clothing that we purchase. However, it is also important to minimise the impact of that minimal consumption that we still need to acquire. A good option is the purchase of second-hand cloth to optimise the CO<sub>2</sub> that was necessary for its production.

#### *Find sustainable production brands*

You can also look for clothing with a focus on sustainability. To be a sustainable brand it is necessary to undergo the examination of an independent organisation that visits the corresponding factory and issues a



*Textile Mountain. The hidden burden of our fashion waste (20 min documentary)*

certificate in this regard. Among the seals that certify sustainability are: GOTS, Textile Exchange, Made in Green, Blue Sign, PETA and CAAE. But watch out for green washing! It is well-known that fashion brands use advertising campaigns highlighting their concern for sustainability - even though they are really not changing much for the better.

### **Step 3 - Take action!**

Now that you know about these issues and what to do about them in your everyday life, you should spread the message! For instance you could try to form a work group, so that together you can explain the issues to a larger group of people.

#### *Teaming up*

You must work on two levels. On the one hand, look for classmates, friends and family who want to participate with you in this idea. On the other hand, look for relevant local channels which can help by spreading your message. Through social media or by writing emails you can find many allies!

#### *Design and carry out your campaign*

First of all, you should create a document with images, videos and messages to show.

Secondly, you should pick a date and place for the campaign. For instance, you could look for an excuse such as a fashion show, or gather in front of responsible fashion stores in your city with your material. The more people you can make aware of the problems, the bigger the chance that fashion brands and shops will eventually do something about it.

Good luck with becoming an agent of change!

[Click here for questions and exercises about this section](#)





# THE GREEN FUTURE OF SPAIN

Throughout the latest centuries, like most countries in the world, Spain adopted a growth model based on the abusive and linear use of resources: extract, produce, consume and throw away. This pattern has caused unprecedented environmental degradation in history and has precipitated the climate crisis.

Climate change is not just a threat for the next decades; it is a present reality already transforming Spain and the lives of at least two thirds of its inhabitants. In the last four decades, the average temperature in Spain has increased by approximately 1.8°C. The Spain of 2050 will be much warmer, drier and more unpredictable than it is today.

With a massive global effort, the world could settle for moderate mitigation that manages to limit the increase in global temperature to about 2°C in 2050 and 2.5°C in 2100. However, if we only manage to fulfil current objectives and policies, global temperature by the end of the century would reach a value close to 3°C above pre-industrial period.

## More ambitions needed

Therefore, it is crucial that all countries take urgent action. International cooperation and technology transfer to countries with lower income will be essential. Thanks to the public and private efforts and the recent boost from European Recovery Funds, it is likely that Spain is able to meet the objectives set for 2030.

However, in the eyes of civil society and leading climate organisations more ambition is needed. Furthermore, achieving the objective of climate neutrality in 2050 is a much greater challenge, which goes beyond the adoption of new technologies. This would require a structural transformation of our economy and our social patterns. In this sense, the high Spanish dependence on fossil fuels from abroad is, however, a good driver of the transition towards renewable sources of national origin.

## Big urgent changes

The uncertainty about which climate scenario we will face in the future shows the need to drastically increase

efforts to improve our resilience. The Spanish Government assures in Spain's Strategy for 2050 that four big urgent changes are on the horizon:

### 1. The way we generate, store and consume energy

In 2050, many of the devices we power today with fossil fuel, like heaters, kitchens or cars, will work exclusively with electricity from renewable sources. This change will not be immediate or easy. Our country will have to close its last coal-fired power plants, achieve a change in consumption habits among citizens, and greatly improve energy efficiency in all sectors.

### 2. The way we move and transport goods

There will be fewer private vehicles and more shared vehicles, more bicycles, and more public transportation in 2050. Given the high uncertainty about the technological future of many alternatives, it is essential to take into account the potential negative costs of wrong bets. Likewise, it will be relevant to adapt taxation to the new reality of transport to correct its negative externalities and establish clear signals that guarantee its long-term decarbonisation.

### 3. The way we produce goods and services

This change will be twofold. On the one hand, we will go from a model from a linear economy to a circular one, in which the value is maintained for as long as possible, reducing the generation of waste and taking advantage of those that cannot be avoided. On the other hand, we will redesign our economy so that more and more services are sold instead of goods.

### 4. The way we consume goods and services

The transition to a circular economy and future technological advances will help prevent this collapse. However, they will not be enough on their own. It will be necessary to reduce the consumption of certain raw materials and products. The Spanish population will have to reduce its intake of food of animal origin, the amount of newly produced clothing it buys, and the number of new digital devices and household machines it acquires per year. It will also have to become more restrained in its movements, especially highly polluting, and pay attention to the environmental footprint that its consumption generates beyond our borders.

## Political will is not enough

Spain is currently working on its green recovery plan, as it will be one of the key beneficiaries of the EU Recovery Funds. The main areas defined in the initial draft of Spain's Recovery and Resilience Plan for the energy transition are efficiency, sustainable mobility, renewable energies, electricity infrastructure, storage and flexibility, and green hydrogen.

But for all this to happen, political will of the Government is not enough in itself. We need to raise public awareness and carry out massive campaigns to all citizens so everyone can understand the crucial moment we are in. People will have to understand that the necessary measures are not a sacrifice but as an investment in the future.

We also need to strengthen the organised civil society to push the green transition agenda with the urgency and ambition it needs. Last but not least we need changes in the corporate sector. Business as usual has to shift to a socially responsible one. This will need legislative changes and economic incentives but also a fundamental cultural change.

[Click here for questions and exercises about this section](#)



*Young climate activists in Catalonia. Credit: Víctor Barro*



# THE GREEN FUTURE OF THE EUROPEAN UNION

In the previous four chapters we have heard about climate perspectives from Denmark, Spain, the Netherlands and Serbia. These chapters provide a snapshot of the general green momentum in Europe, though every country has its own strengths and obstacles. It is clear that the green transition is happening at different paces. Dependency on fossil fuels is higher in some parts of Europe than others, and some countries will have a longer path towards becoming sustainable societies due to political, economic and natural reasons.

On the positive side, the EU member states and institutions have agreed on common climate goals as well as a legally binding climate law. All countries have set national objectives for reductions of their greenhouse gas emissions and started making plans for how to reach them.

A lot of measures have already been implemented, renewable energy sources are being established across Europe, and most sectors of society are preparing for a low carbon future.

## Climate mobilisation

The efforts to prevent climate change are not only happening on a political scale. A lot of initiatives originate from civil society. All over Europe, climate mobilisation is taking place in which citizens and green NGOs are pushing for political changes to reduce the human damage to the climate. The Friday for Future and climate marches in the streets have attracted thousands of citizens. People of all ages and different political orientations express their concern about the future of our planet.

In some countries - such as Spain and the Netherlands - the protests are not limited to the streets but have moved all the way into the courts. Lawsuits are trying to force governments to act on the climate situation, and the legal system seems to acknowledge their claims. When governments do not live up to their responsibility, they need to improve their efforts according to the law.



*Youth for Climate - March for a better future, Brussels 2019. Credit: European Green*



*DakAkker Rotterdam*

## Local initiatives

Some citizens take the green transition into their own hands. All across Europe, local communities gather ideas for reducing the human impact on the climate.

Some are focused on local energy production such as the Spanish energy community of Luco de Jiloca or the village of Terheiden aiming to become the first energy-neutral and natural gas-free village in the Netherlands. Also, a lot of new housing projects include sustainability in their building plans.

The Spanish housing cooperative Entrepatrios is just one example of an energy self-sufficient project with an additional focus on other sustainable solutions such as water recycling.

The sharing of resources is generally a widespread solution for the reduction of the individual climate footprint. For instance electric car sharing initiatives such as the non-profit consumer cooperative Som Mobilitat located in Catalonia.

Other communities focus on the prevention of food emissions with a focus on climate friendly diets and by growing local fruits and vegetables close to the consumption. Some initiatives such as the Danish Tagtomat and Dutch DakAkker Rotterdam even use rooftops in urban areas for local food production.

## Citizen participation

Finding climate solutions is not a question of either political or civil actions. The political system has a responsibility to engage the citizens in climate decisions and listen to their ideas and concerns along the way. During recent years, citizens meetings have been established with the climate as one of the topics to be discussed. For instance, the Dutch governmental project “Kijk op Europa” including physical dialogues between Dutch citizens on European climate politics.

Experiences from such meetings show that citizens are generally open to finding solutions - and often more ambitious than what their governments intend to suggest. The inclusion of citizens does not only benefit the democratic legitimization of climate politics. Citizens participation can push the governments in a more ambitious direction as well.



*Conference on the Future of Europe - Climate change, Environment/Health' in Warsaw, 2022.  
Credit: European Parliament*





Blue battery technology - energy stored in water. Credit: AquaBattery

## Climate innovation

Without technical innovation the climate goals would never be realised. Research and engineering are the foundation of the green energy transition already taking place today. The Dutch chapter presents some of the potential solutions for the future such as iron fuel, blue batteries or hydrogen gas which can be used for existing fossil gas pipes. Innovation across different sectors of society is also necessary. The Spanish platform 'Comunidad por el Clima' is an example of a social network in which the public administration, business and citizens are working together to accelerate climate action.

## From ambitions to actions

Still a lot is left to be done in order to reach the climate goals. Having high ambitions is not enough but needs to be followed up by concrete plans and actions. This is what the Danish government has been told twice in the annual reports from the independent climate council (DCCC). In 2019, Denmark signed a climate law with a clear objective of 70% emission reductions by 2030. This was seen as a huge success for Danish democracy and the green transition in Denmark - especially since the climate law was supported by nearly all parties of the Danish parliament.

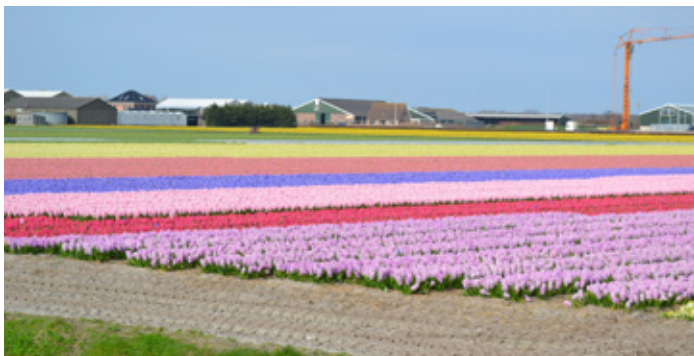
But one thing is to agree on ambitious climate objectives, another is to agree on concrete measures for reaching them. Just like any other political issue, climate politics is essentially a question of priorities. Distribution of resources for the green transition follows

the same ideological directions as other political issues. How are we financially going to cover the necessary investments, and who is going to feel the consequences?

Regarding EU objectives, Denmark has already fulfilled its commitments in relation to energy efficiency and renewable energy. However, 75% of the Danish renewable energy consumption comes from biomass of which about half is imported wood. This gives no guarantee for a sustainable production, when for instance trees are replanted so that carbon can be stored again. At the same time, the CO<sub>2</sub> emission from burning wood is not counted as a part of the Danish emissions since biomass is considered a carbon neutral energy source, according to EU calculation. Without a massive import of wood, the Danish emissions from the energy sector would be counted significantly higher.



Artificial ski slope on the roof of an energy plant in Copenhagen. Credit: [Ann Priestley](#)



*Flowering fields in the Netherlands.*

## From low to higher ambitions

As a vulnerable country to rising sea levels, a lot of efforts have already been put into adapting the Netherlands to climate changes. This is in line with the official EU plan of becoming climate resilient by 2050. Adaptation is important for any country in the world since climate change impacts will be unavoidable in the future. In the Dutch example, it is clear that the country also needs to increase its efforts to mitigate climate change. So far the Dutch objectives do not meet the requirements of the EU climate law or the Paris Agreement.

As the chapter shows, a lot of efforts are being put into developing innovative technology that eventually could become a part of the green transition. However, climate experts agree that there is not enough time to wait for decades before new solutions might come into play. Like the rest of the world, the Netherlands needs to speed up the installation of existing renewable energy technologies which can be established within a short period of time.

As a densely populated country, this is a big challenge - especially while keeping the place as the second largest agricultural exporter in the world. Public resistance against installation of wind turbines or solar panels that disturbs the landscape is not making it any easier. But as some of the Dutch initiatives show, it is possible to obtain support for the green transition through the inclusion of local residents in the solutions.

## Keeping focus on the climate

As one of Europe's largest populations, Spain plays an important role in the overall climate ambitions of the European Union. The Spanish government has passed a climate law and related legislation for the green tran-



*Climate protest during COP25 in Madrid. Credit: Víctor Barro*



sition. According to critics, the objectives and measurements are not enough though, and the Spanish government needs to raise their climate ambitions.

During the years a lot of green initiatives have arisen from the Spanish civil society, and surveys showed significant support for tackling the climate issue in the population. However, the covid-pandemic seems to have caused a decrease in the public awareness similar to tendencies in other European countries. In the latest Eurobarometer, fewer people see climate as one of the most urgent challenges of the world. Instead healthcare and economic recovery seem to be given higher priority.

There is a risk that climate change will have even less priority in the aftermath of the Russian invasion of Ukraine. This has already upscaled security politics and pushed many European countries to quickly raise their military budgets. At the same time, rising energy prices has led to protests in Spain as well as other European countries with people questioning climate taxes on fossil fuels. On the contrary, the Russian invasion has also led to an instant desire for a fast independence from Russian gas and oil which could benefit the green transition.



*Protests in Belgrade. Credit: Igor Cvetković*

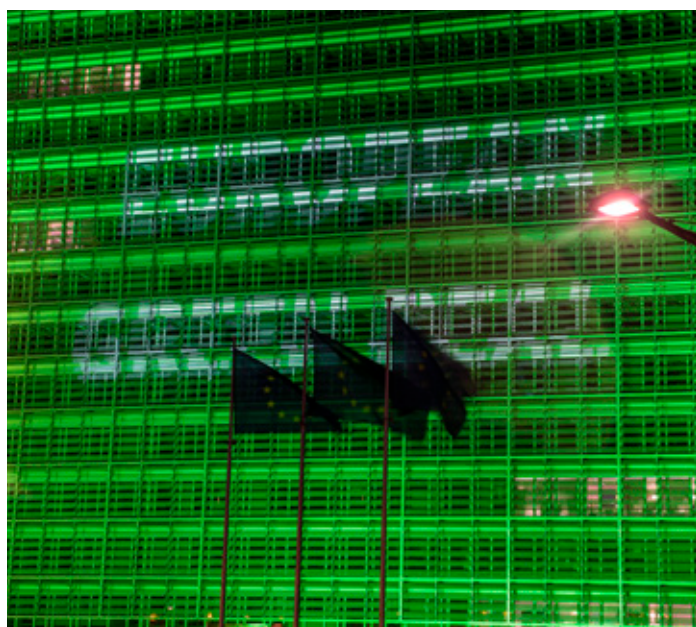
## Let go of the coal

From the Serbian chapter, it is evident that the country has a long way to go when it comes to the green transition and the effort to reduce greenhouse gas emissions. Just like some EU member states, Serbia is still fully dependent on coal as an energy source. Serbia also has some of the highest concentration of PM pollutants in Europe causing massive healthcare problems.

Fortunately, ongoing protests are putting pressure on the Serbian Government to reduce the pollution. In connection with a growing climate awareness in the Serbian public, there is a hope that these protests even-

tually will include the demand of ambitious climate politics as well. Serbia is however struggling with other issues not present at the same level in most EU member states. First of all, Serbia lacks financial support for the green transition. At the same time, there is a risk that such support may not reach the intended projects due to misuse of resources.

As a part of the accession process of becoming a member of the European Union, Serbia has opened chapter 27 regarding environment and climate issues. According to NGO's, climate progress is moving very slowly though. There is however a hope that projects such as the green agenda for the Western Balkans could move Serbia in the right direction.

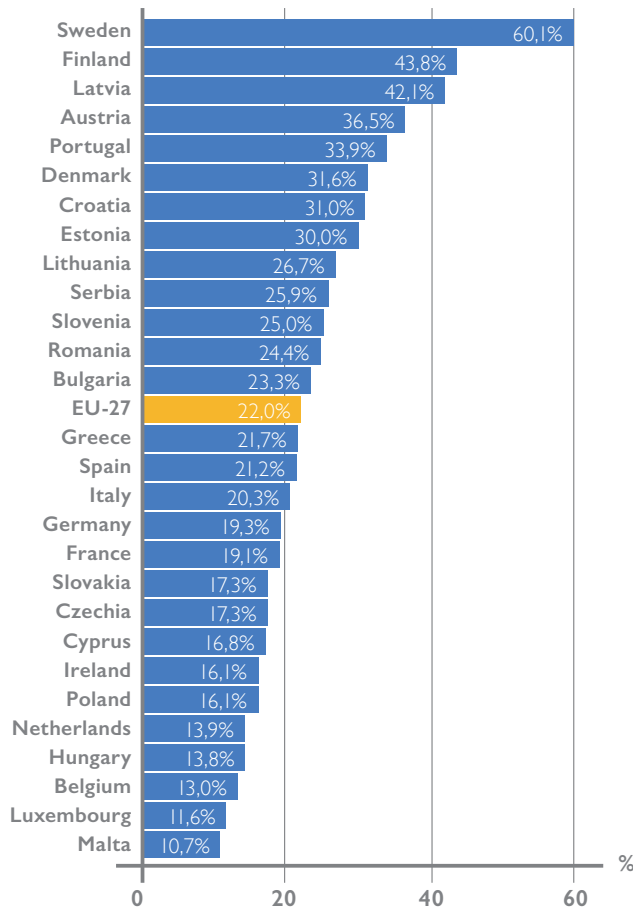


*The headquarters of the European Commission in Brussels.  
Credit: EC - Audiovisual Service*

## EU Climate Politics

As the chapters show, all countries relate to standards of the European Union when forming their individual climate policy. The EU determines overall goals for emission reductions and other related targets such as renewable energy and energy efficiency. During the years, a lot of green initiatives have been started on an EU-level. Both as a part of the European Green Deal and as reforms of existing programmes with new climate related measures. These include plans for energy efficient building, sustainable vehicles, circular economy, food sustainability and biodiversity. The Commission aims to mobilise at least one trillion euro in sustainable investments over the next decade.

Share of energy from renewable sources in 2020.  
Source: Eurostat



In July 2021, the Commission presented a plan called Fit for 55 with a list of potential measures for reaching the objective of 55% emission reductions by 2030. It also includes a proposal to raise the target of renewable energy from 32 to at least 40% of the overall energy mix by 2030. In 2020 the EU average was 22%.

## The Just Transition Mechanism

Depending on the energy mix, the costs of the green transition will be higher for some countries than for others. Therefore, one of the first initiatives of the European Green Deal was a fund for helping countries heavily dependent on fossil fuels and high-emission industries. The Just Transition Fund will invest 17.5 billion euro between 2021 and 2027 in the territories most affected by the transition to a climate-neutral economy. Due to the compensation there is a hope that the opposition to the green transition from the affected countries might be less pronounced. Poland, Romania, the Czechia and Germany are expected to receive most from the fund.



Green NGO's and MEP's during EU ETS protest in Brussels.  
Credit: [The Greens/EFA](#)

## EU Emissions Trading System

Fit for 55 also includes a reform of the European Union Emissions Trading System. Since 2005, it has been a central tool in the effort to bring down emissions. EU ETS is based on a "polluter pays principle" in which industries have to pay for their greenhouse gas emissions. It is designed as a market where companies can buy and sell emission permits.

The idea is to provide incentives for companies to reduce emissions in the most cost-effective manner. According to the EU Commission, the ETS had successfully brought down emissions from power generation and energy-intensive industries by 42.8% between 2005 and 2021.

During the years, the EU ETS has been criticised for several reasons. In the beginning, free permits for certain industries were granted on a large scale, which caused very low incentives for reducing GHG-emissions. Another criticism has been related to price development of the permits. Like any other market asset,





prices can go up and down depending on the supply and demand.

The price of permits tripled in the first six months after the launch in 2005, then halved within a week in 2006 and declined to zero during the following year. With the rising energy prices in 2021, member states such as Spain and Poland have called for trading limits on who can invest in the ETS permits to avoid even higher prices caused by ETS-speculation.

In the beginning, only energy-intensive industrial sectors as well as power and heat generation were included in the system. In 2012, it was extended to the airline industry within the European Economic Area (EEA). As a part of the Fit for 55-package, the EU Commission has proposed to include emissions from maritime transport. It also considers including the building and road transport sectors in a new, separate emissions trading system.

## Common Agricultural Policy

Despite the high level of GHG-emissions, the agricultural sector has so far not been included in the ETS. Food security and price stability for European farmers has been a key element for the European Union since the beginning. The Common Agricultural Policy (CAP) was launched in 1962 with subsidies for farmers and food production in the member states. The CAP budget for 2022 is 53 billion euro which is 31,6% of the total EU budget.

During the years CAP has been criticised for several reasons, some of which related to the negative climate impact of farming activities financially supported by the EU. To ensure that the agricultural sector contributes to the green transition like other business sectors, a reform of CAP has been proposed as a part of the Green Deal. In December 2021, this was formally adopted to take effect from 2023. According to the



Protest for changing the Agricultural Policy of the EU. Credit: [The Greens/EFA](#)

plan, at least 40% of the CAP budget will have to be climate-relevant by 2028.

As a result, each EU country will have to identify their strengths, weaknesses, opportunities and threats (a so-called SWOT-analysis) related to their territory and agricultural sector. Based on this they shall make action plans for how to contribute to the Green Deal targets. Every future national CAP strategy plan will also have to be more climate ambitious than the previous one.

EU countries were given until 31 December 2021 to submit their national CAP strategic plans followed by six months for the EU Commission to approve the plans ahead of their implementation.

Other initiatives aiming to reduce the climate impact of food production have been gathered in the so-called “Farm to Fork”-strategy, for instance targets and plans for food waste reduction. According to Eurostat, 20% of food production is wasted within the European Union. At the same time 33 million EU citizens cannot afford a quality meal every second day.



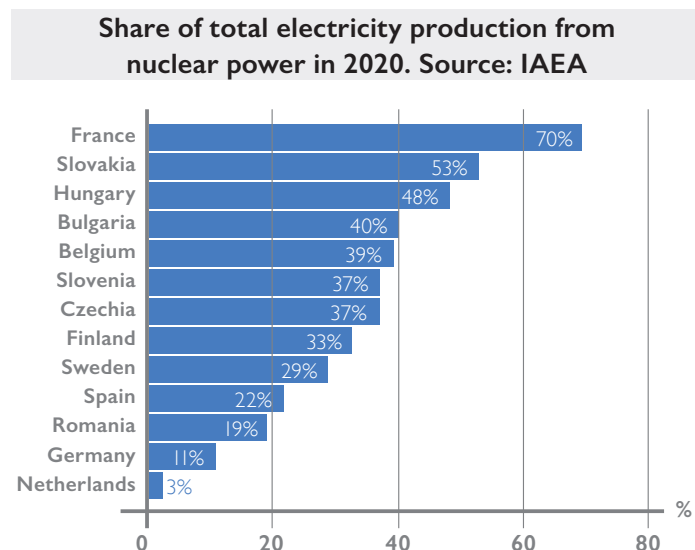
President of the European Commission presenting the new taxonomy for sustainable activities. Screenshot from [Twitter](#).

## Sustainable investments

Another strategy of the European Green Deal is to attract private investments which can support the green transition. For this the EU is developing a so-called taxonomy for sustainable activities. The idea is to provide companies, investors and policymakers with definitions for investments that can be considered environmentally sustainable. Deciding which investments to give this label has not been easy to agree on though.

Nuclear power and natural gas are especially dividing the EU members.

Nuclear power is a component of the energy mix in 13 of the 27 countries and accounts for almost 26% of EU electricity production. However, due to safety issues, nuclear power is seen as controversial in some countries. Therefore, Germany decided to phase out nuclear power by 2020, and Belgium by 2025. On the other hand, member states like the Netherlands have recently built or are going to build new nuclear plants in the near future. In France, nuclear power covers 70% of the electricity production and is seen as a central tool for the green transition in the country. Other countries, such as Denmark, never began the installation of nuclear plants and have decided to focus on renewable energy sources such as wind and solar power instead.



In February 2022, the EU Commission proposed including nuclear power and natural gas in the taxonomy as long as it contributes to a reduction of emissions from existing energy production. This has been criticised by green NGOs and political parties for diluting the idea of the taxonomy. Natural gas is a fossil fuel and should never be labelled as green, according to the critics.

Nuclear plants can deliver emission free energy, once they are set up and running. This takes an average of 14.5 years and in some cases even much longer. For instance, the building of Finnish Olkiluoto Plant has been delayed for 22 years due to technical problems. Therefore, the investment in new nuclear plants is not a solution that can bring down emissions before 2030, and should therefore not be included in the taxonomy, according to the critics.





*Credit: European Union*

## Recovery and Resilience Facility

The green investments do not all originate directly from initiatives under the European Green Deal. Due to the economic problems caused by the covid pandemic, the member state leaders decided to find a common solution to recover the economy within the European Union. In July 2020, they agreed on a recovery plan of 723.8 billion euro mobilised between 2021-2023. 385.8 billion euro will be given as loans and 338 billion euro will be given as grants which do not have to be paid back.

The overall framework is called NextGenerationEU with the aim to make the member states stronger and more resilient. As a part of the deal, at least 37% of the spending must be used on green investments. To receive support, member states need to submit a national Recovery and Resilience Plan explaining how the countries intend to contribute to the green agenda.

All grants and plans have since been published through [the webpage](#). For instance, Denmark will be supported by 1.5 billion euro in grants. The Danish plan con-

sists of 33 investments and 6 reforms of which 59% will support climate objectives. Spain will be supported by 69.5 billion euro in grants. The plan consists of 112 investments and 102 reforms of which 40% will support the climate objectives. Due to lengthy government negotiations, the Netherlands as the only EU member state had not yet submitted their plans by March 2022.



**EUROPEAN UNION**

European Regional Development Fund

## EU Regional Development Fund

Another fund brought into play for the green transition is the European Regional Development Fund (ERDF). It has existed since 1975 with the aim to strengthen economic, social and territorial cohesion in the European Union by correcting imbalances between its regions, for instance remote locations or sparsely populated areas.

The budget of 2021-27 is 392 billion euro of which 30% will support investments to make European regions “greener, low-carbon and resilient”. One of many examples of such projects is the installation of a small hydroelectric power station at the Valmayor reservoir of Spain. This helps the local water supply company to reduce fossil fuels dependents and cut CO2 emissions.

Another project is seeking to help small and medium-sized enterprises in the Danish capital region to develop green business plans. A third example is the support for a Green Protein Accelerator project in the Netherlands. The funding goes to the development of testing facilities for making sustainable, plant-based proteins that can replace meat for industrial production.



## Life programme

In February 2021, the European Commission presented a strategy on adaptation to climate change. The main goal is for the EU to become climate resilient by 2050. Some initiatives to achieve this goal can be found in the Life Programme, which has existed since 1982 with a primary focus on nature conservation. Since then, climate initiatives were added to the programme.

In February 2022, the EU Commission announced an investment of over 110 million euro into projects for environmental and climate protection in 11 EU member states countries: Cyprus, Czechia, Denmark, Estonia, Finland, France, Latvia, Lithuania, the Netherlands, Poland and Slovenia.

For instance, in the Netherlands where the LIFE funding will stimulate climate change adaptation across sectors such as water management, infrastructure, ag-

riculture, nature, health and spatial/urban planning. Other projects are related to climate mitigation. For instance, a project for transforming waste into resources as a part of a Danish Action Plan for Circular Economy.



*Flags outside the United Nations conference venue.  
Credit: UNclimatechange*

## EU and the rest of the world

The European Union does not only support the green transition within its member states. As we have seen in the Serbian chapter, support is also provided for member candidates as well as developing projects in the rest of the world. Besides the support of finance and knowledge, the EU also has an indirect impact on climate politics in the rest of the world. This is referred to as the “The Brussels Effect”. It explains how regulations drafted in the EU can shape the global market. Most multinational corporations tend to follow EU regulations in order to access the European market. To avoid the cost of producing different products for different markets, they often apply the EU standards for all products sold worldwide. This tendency is also expected as a result of the new regulations of the Green Deal.

One direct influence is through the introduction of a so-called carbon border adjustment mechanism. This is related to the previous mentioned Emissions Trading System (ETS). When emissions get more expensive within the European Union, there is a risk of carbon leakage. This is when the production of goods moves from one country to another, where emission is cheaper due to less strict climate policies. This would lead to a reduction of EU emissions, while the overall emissions would stay the same or even increase on a global scale.





To reduce this risk, the EU has proposed a fee on imported products that will equalise the price of carbon in EU products. It also aims to encourage industry outside the EU to take steps in the same direction. The Carbon Border Adjustment Mechanism is supposed to be phased in gradually from 2023-26 and will initially apply only to goods at high risk of carbon leakage such as iron, steel and aluminium.

## Green future of the European Union

It can be debated whether the green ambitions of the European Union are high enough. According to the United Nations' Emission Reports, the EU would need a 65% reduction of greenhouse gases by 2030 to be in

line with the objective of the Paris climate agreement. This objective was therefore proposed in the EU Parliament, but turned down in the negotiations between member states and the EU Commission. A 55% reduction was as ambitious as it could get for now. Still, the new objective is better than the previous 40% reduction target, and the EU reduction targets are generally high compared to other regions.

With the European Green Deal and Fit for 55, the EU has launched widespread initiatives to accelerate the green transition. Some are still to be negotiated though. Like other ambitious plans from the EU, there is a risk of significant dilution once every interest is taken into account. Especially those of business and heavy industry dependent countries. The Just Transition Fund as well as the Carbon Border Adjustment Mechanism might make the necessary reductions of greenhouse gases more acceptable.

Whether the rest of the green deal and the climate politics will be enough to reach the targets is yet to show. At least it has made the member states establish climate goals and concrete plans for how to achieve them. Financial support for climate initiatives should also push the green transition forward. No matter what, the years to come will be decisive for the green transition of the European Union as well as the rest of the world.



Activists demanding political climate action from the European Commission representative, Maroš Šefčovič. Credit: EC - Audiovisual Service