

# Energy use

Welcome to Energy use.

This free, short course explores different ways energy is used and helps you to identify and understand your own energy consumption patterns. The course also shares some ideas for how you can reduce your energy consumption.

You might be:

Interested in better understanding how energy is produced and consumed.

Thinking about how to save money by reducing your energy consumption.

Curious as to what the digitalisation of energy really means.

This course will deepen your understanding of the digital energy transition and support your own digital energy journey!

The course lasts for around 30 minutes. It is a self-paced, stand-alone course and part of the suite of 12 courses called Digital Energy Essentials. At the end of the course, we suggest some further learning materials for you to explore. If you are unfamiliar with what digital energy is and the reasons behind moving towards digitising our production and consumption of energy, you may want to start with the first course *What is the Digital Energy transition?*

This course is part of a suite of learning materials developed by the Every1 project which aims to enable and empower everyone's engagement in the energy transition. You can find out more about the project by going to [every1.energy](https://every1.energy).

If you enrol and you view all sections of the course and successfully complete the short quiz, you will be awarded an Every1 digital badge.

This project has received funding from the European Union's Horizon Programme for Research and Innovation (2021-2027) under grant agreement No 101075596. The sole responsibility for the content of this course lies with the Every1 project and does not necessarily reflect the opinion of the European Union.

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### **Course learning outcomes**

After studying this short course, you should be able to:

- Understand how energy is produced and consumed.
- Better understand your own energy consumption at home.
- Identify ways you could reduce your use of energy.



Empowering eVeryone's Engagement in eneRgY

## Energy use



## How this course works



This short 30-minute course explores different ways energy is used and helps you to identify and understand your own energy consumption patterns.

The course also shares some ideas for how you can reduce your energy consumption.

You might be interested in a better understanding of how energy is produced and consumed, you may be thinking about how to save money by reducing your energy consumption, or curious as to what the digitalisation of energy really means.



## How this course works



This course deepens your understanding of the digital energy transition and supports your own digital energy journey! It is part of the suite of 12 courses called [Digital Energy Essentials](#), developed by the Every1 project which aims to enable and empower everyone's engagement in the energy transition. You can find out more about the project by going to [every1.energy](http://every1.energy).

At the end of the course, we suggest some further learning materials for you to explore. This includes the course [What is the Digital Energy Transition?](#) which explores what digital energy is and the reasons behind moving towards digitalising our production and consumption of energy.



If you view all sections of this course and complete the short quiz, you will be awarded an Every1 digital badge.



## Learning outcomes

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- Better understand your own energy consumption at home.
- Identify ways you could reduce your use of energy.

## Introduction



Do you know where the energy you use comes from?

Understanding which sources of energy are used to produce the things we need and provide energy in the home or at work can help us to better understand the impact of the choices we make.

Digital technologies support our understanding through providing detailed real-time insights into how and when we use energy.



## Introduction



This course takes a broader look at how we use energy: at the European level, country or regional level, and within our own households.

Europe's energy sector has undergone profound changes following Russia's invasion of Ukraine.

Since the war triggered an energy crisis that sent prices to record highs, European countries have put energy security at the top of their political agendas, dramatically reducing fuel imports from Russia on which they had previously relied.

European countries have substantially raised their clean energy ambitions, aiming to further diversify their energy mixes while making progress towards climate targets.

## Introduction



Energy security, which ensures that we have a diverse range of energy sources, whilst reducing our reliance on oil, gas and coal, is therefore a critical part of the digital energy transition.



## Energy creation and consumption



We use energy in different ways. We use energy to heat or cool buildings, and to run lights, devices, and appliances.

We use energy to power vehicles such as cars, buses, boats or planes. Machines and factories also use energy.

However, have you ever thought about where your energy comes from and what types of energy were used to produce the energy or objects that you use? Let's look at the journey of energy creation and consumption in more depth.



## Energy creation and consumption



Fossil fuels such as coal, oil and natural gas can be burned to generate electricity and heat.

Renewable sources such as sunlight and wind can also be used to produce electricity.

These energy sources are called **primary energy**, as they don't need to be modified or processed before they are used in energy production.



## Energy creation and consumption



Electricity is called **secondary energy** as it has been produced from primary energy sources. Primary energy sources, such as fossil fuels, are often transformed into more useful or practical forms before being used. For example, crude oil is refined into many different types of fuels and products.

**Final energy** is how energy is made available to us, as consumers, so that we can make use of it. For example, electricity is provided directly to our home from a power plant via a grid system.

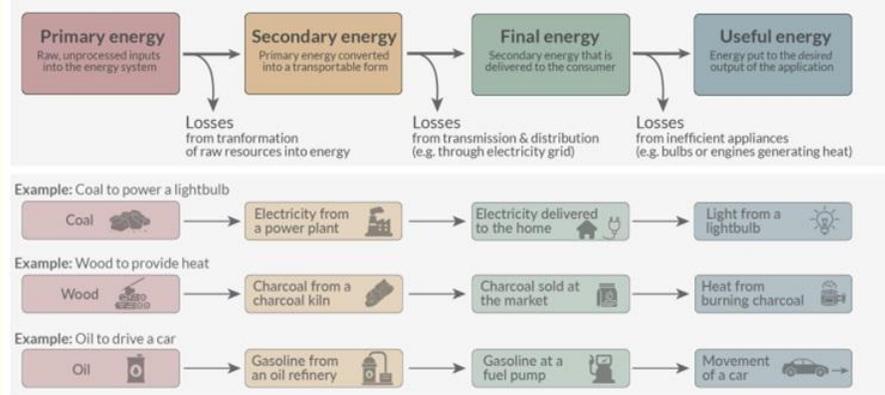
**Useful energy** is the term used to describe the intended outcome of our energy use. For example, using energy sources such as electricity to power appliances or produce heat for cooking or warmth.

To help illustrate the journey from primary energy to useful energy, let's take a closer look at some examples of how we produce and consume energy in the diagram on the next slide.

Here are some examples of how we produce and consume energy.

## The four ways of measuring energy

Our World in Data



Icon source: Noun Project. OurWorldinData.org - Research and data to make progress against the world's largest problems. Licensed under CC-BY by the author Hannah Ritchie.

As detailed in the previous diagram, at each stage energy is lost as it is transformed, transported or used.

We can not only make decisions about where our final energy comes from (e.g., choose clean energy sources, where possible) but also prevent energy being wasted through how we consume it.

For example, we might be able to use energy efficient light bulbs, or energy saving devices to reduce our energy consumption at home or work.

If we use a car, we can reduce our fuel consumption through changing the way we drive or de-cluttering our car boot, so we are not carrying so much weight.

## A closer look at how we use energy at home

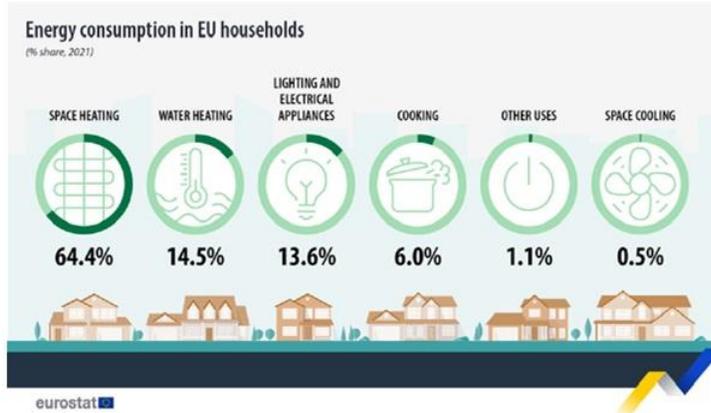


Look at this Eurostat graphic *Energy consumption in EU households*.

It outlines what activities use energy in homes across the European Union.

Does anything about these figures surprise you?

How do you think this compares with your individual or household energy consumption?



## A closer look at how we use energy at home



Across Europe, we also have different energy demands and needs, depending on where we live.

Factors such as economy, geography and history, can greatly impact a country's energy needs and which energy sources it relies on to meet those needs, such as fuelling automobiles, heating or cooling homes, or running factories.

If you live in Northern Europe where the weather is colder, you may consume more energy for space heating for example, compared with homes in Southern European countries where the weather is often warmer.

Looking at individual country energy consumption can give us a very different picture of energy use.

## A closer look at how we use energy at home



If you are interested in exploring different countries' energy patterns, and understanding more about where you live, you can use [IEA tools](#) to compare where you live with other countries across Europe.



## How to save energy



When we consider how to reduce our energy consumption, we also need to consider how we can use energy more efficiently.

You can see some ideas for how to save energy in the diagram on the next slide called International Energy Association (IEA) *7 ways to save energy*.

It also has an accompanying article [Things you can do to use less energy and cut your bills](#).



## How to save energy



### 7 ways to save energy



## How to save energy



We could save energy by: (select each one to learn more)

1. Reducing waste

2. Changing our behaviour

3. Making our appliances more efficient

## How to save energy



We can also reduce specific types of energy consumption. For example, although we may not consume less energy unless we make changes like those suggested above, we can reduce our consumption of energy from fossil fuels by choosing energy from clean technologies.

For more advice on how to save energy, you might want to explore the Energy Saving Trust (UK) article [Quick Tips to Save Energy](#). Although produced for the UK context there are useful tips that can make a real difference to your energy consumption, wherever you're based.



## How to save energy



Finally, whilst we may choose to use energy more efficiently, switch to energy from clean technologies or make use of energy saving devices, it's important that we don't unintentionally change our behaviour to negate any benefits and therefore *increase* our overall energy consumption!

We need to remain vigilant for what is described as the **rebound effect**.

For example, you may save money through reducing your use of electricity by using energy efficient devices and lightbulbs. However, your overall energy consumption may remain the same or increase as you now no longer routinely switch off lights or appliances when they are not needed.

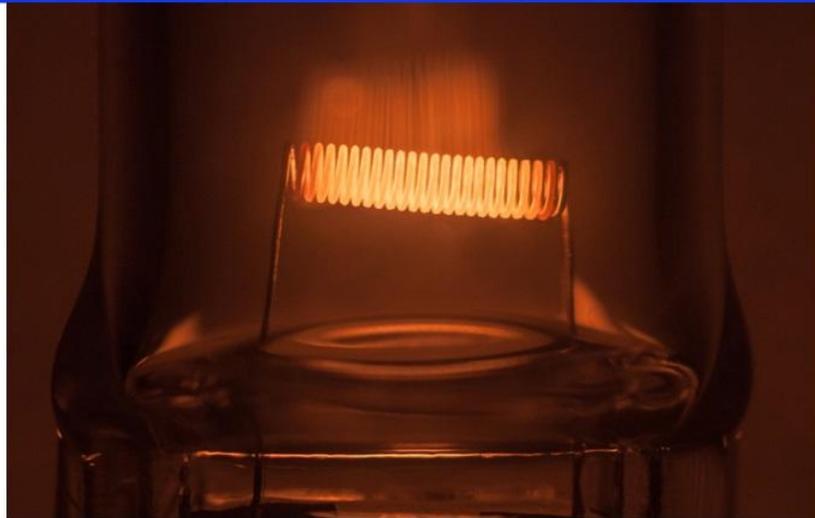
Although you may still be saving money, any actual energy saving is effectively cancelled out.

## Conclusion



Energy production and consumption is a complex picture.

It is impacted by a variety of factors including geography, history and economy.



## Conclusion



The decisions we make about how we use energy in our own homes also have a key role to play in the digital energy transition and the increased use of clean technologies.

We can be more conscious of our energy use by reducing our use of energy, making different choices (for example, by switching to clean technologies) and better managing our energy use.

Digital technologies support these activities whilst increasing energy security, comfort, protecting the environment and potentially saving money.

This course is part of the [Digital Energy Essentials](#) series.

You may want to explore our course [What is the digital energy transition?](#) to find out more about what the digital energy transition is and how this transition is taking place.



## Additional resources

This short video [Energy Slaves](#) explains how much energy is needed for different activities in the home and introduces the openly licensed course from [TU Delft](#) in the Netherlands.

For a more in-depth look at energy use in the European Union, try this Eurostat course [Shedding light on energy in the EU: A guided tour of energy statistics](#).

Experiment with this International Energy Agency (IEA) [Energy Mix tool](#) to see how much energy we use for different purposes.

## Acknowledgements



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## Course quiz

After successfully completing the quiz, you will be awarded your Every1 digital badge.

[GO TO THE COURSE QUIZ](#)



## Course quiz

Now it's time to complete the course quiz – it's a great way to check your understanding of the course content.

This quiz contains 3 questions and a pass mark of 70% and above is required if you'd like to be awarded your Every1 digital badge.

You can review the answers you gave, and which were correct/incorrect, after each attempt has been completed.

If you don't pass the quiz at the first attempt, you are allowed as many attempts as you need to pass.

Grading method: Highest grade

Grade to pass: 21.00 out of 30.00