What is the digital energy transition

This is a free, short course that explains what the digital energy transition is and how this transition is taking place.

You might be:

- Interested in consuming less and understanding what practical steps you can take to improve your energy consumption and potentially save money.
- Curious about how new technologies are making a difference to how we produce and consume energy, and how we can use energy more effectively.
- Concerned about climate change or rising energy costs and how to better manage your energy usage at home.

It will give you a better understanding of the digital energy transition and help get you started on your own digital energy journey!

It is a self-paced, stand-alone course which takes around 30 minutes to complete. At the end of the course, we suggest some further learning materials for you to explore, including the course *Why Digitise Energy?* which explores why the digital energy transition is important and some of the benefits and challenges.

This course is part of a 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**.

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.

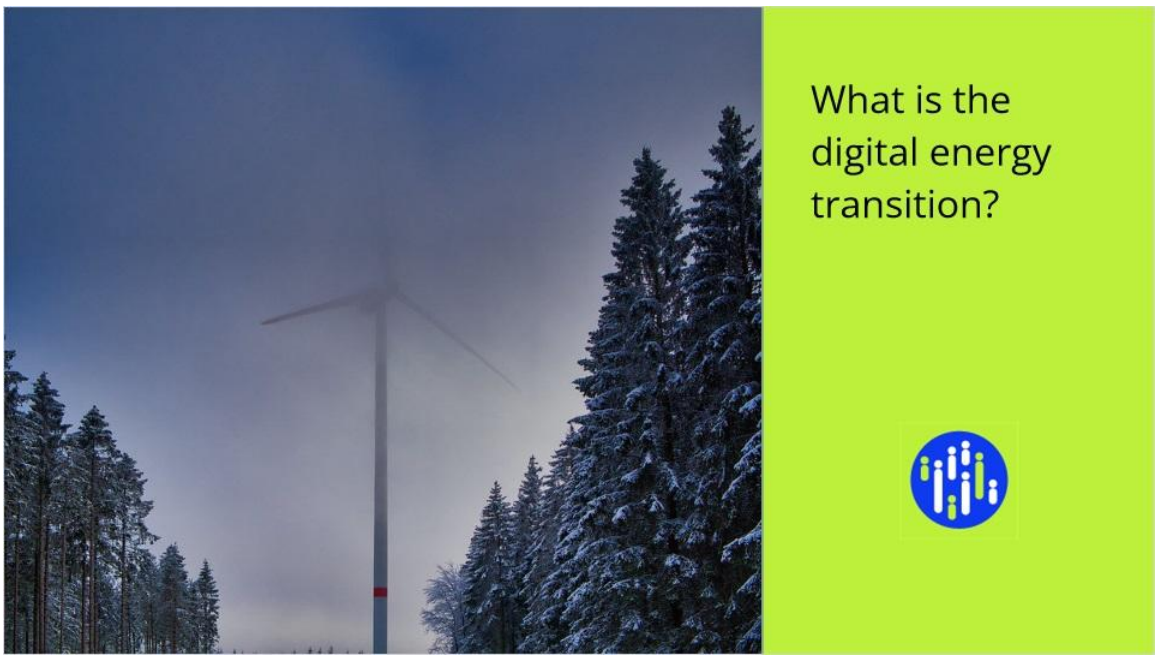
This project has received funding from the European Union's Horizon Programme for Research and Innovation (2021-2027) under grant agreement No 101075596. The sole responsibility for the content of this course lies with the Every1 project and does not necessarily reflect the opinion of the European Union.

This course is an adaptation of selected material from the **International Energy Association (IEA) Digitisation and Energy Report (2017)**. This is the **attribution and copyright statement**.

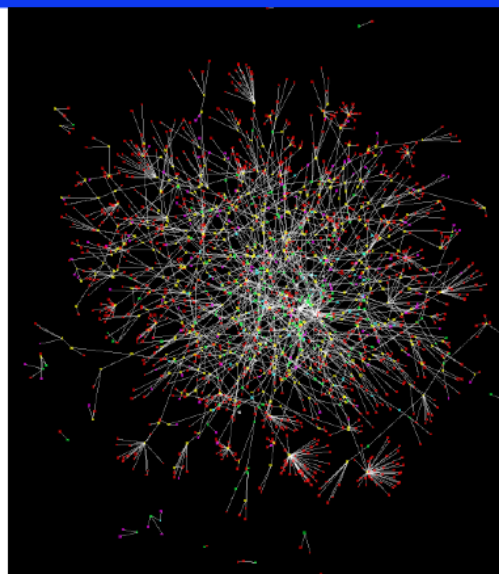
Course learning outcomes

After studying this short course, you should be able to: Describe what the digital energy transition is.

- Describe what the digital energy transition is.
- Give some examples of how energy production and use are digitalised.



How this course works



This short 30-minute course explores what digital energy is and the reasons behind moving towards digitalising our production and consumption of energy.

You might be interested in consuming less energy and understanding what practical steps you can take to improve your energy consumption and potentially save money.

Or are you curious about how new technologies are making a difference to how we produce and consume energy, and how we can use energy more effectively? You may also be concerned about climate charge or rising energy costs and how to better manage your energy usage at home.

How this course works

This course will give you a better understanding of the digital energy transition and help get you started on 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.

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Learning outcomes

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- ✓ Describe what the digital energy transition is.
- ✓ Give some examples of how energy production and use are digitalised.

Introduction

EVERY1

Digital technologies are everywhere, and affect the way we live, work, travel and play.

Digital technologies can also improve the way we live. For example, new technologies can help us better understand and reduce our energy consumption.

Digital technologies can also support the reduction of carbon emissions and our move away from fossil fuels to more sustainable and clean technologies.

Introduction

The energy sector has been an early adopter of digital technologies. In the 1970s, power utilities were digital pioneers, using emerging technologies to facilitate grid management and operation.

Oil and gas companies have long used digital technologies to improve decision making for exploration and production assets, including reservoirs and pipelines.

In today's climate emergency, and the shift away from the use of oil, coal and gas, energy digitalisation is key to increasing the effectiveness of technologies such as solar and wind power for producers and consumers.

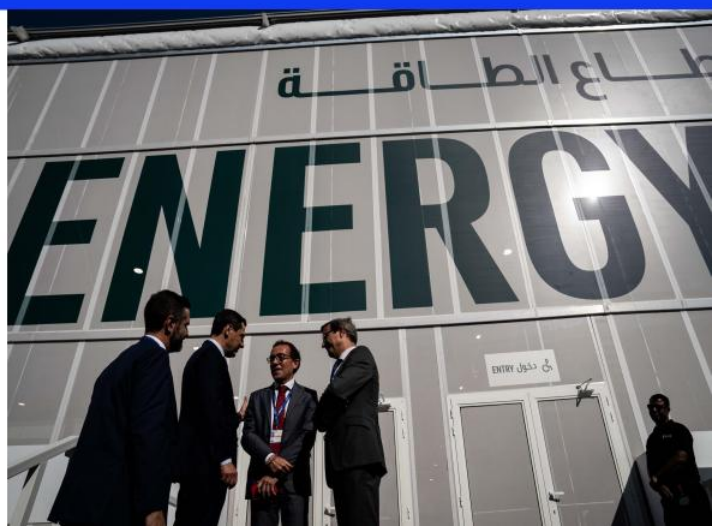
The digitalisation of energy also has an important role in ensuring the safe and effective operation of energy markets and networks through. For example, enabling fault detection and ensuring grid stability.

The energy transition in Europe

We need rapid action to tackle climate change and reduce our dependency on fossil fuels.

Well known examples of international meetings to coordinate action around the world include November 2023's COP28 in the United Arab Emirates.

Participants negotiated efforts to keep global warming within 1.5 degrees Celsius.



The energy transition in Europe

Within Europe, one key initiative is The European Commission's European Green Deal.

The European Green Deal (2019) aims to significantly reduce the amount of greenhouse gases produced in the European Union (EU) region. The aim by 2050 is to have zero net emissions across the EU. This involves rapidly reducing our dependency on, and use of, fossil fuels and replacing them with green energy sources.

The Green Deal also recognises that to do so, the shift away from fossil fuels involves the creation of new industries and economies to support countries' and regions' reliance on fossil fuel economies.

The energy transition in Europe

Central to The Green Deal is that "no person and no place is left behind".

Everyone has a role to play in reducing their energy consumption and engaging in the energy transition.

The energy transition in Europe

Policies such as the EU's Digital Strategy support implementation of the European Green Deal through their focus on ensuring practices and infrastructure are fit for purpose and people have the digital skills they need.

92%

In 2023, 92% of the population in the European Union had access to the internet.

With widespread access to internet enabled devices, digital technologies have a key role to play in addressing the challenges we face and the success of initiatives such as the European Green Deal.

Digital technologies

What do we mean by digital technologies?

Everyday digital technologies that you might use include smartphones and other internet enabled devices, such as your laptop or PC.

Digital technologies

Digital technologies can also include watches, home appliances or cars that are connected to communications networks to provide a range of digital services and applications.

This is called the Internet of Things (IoT).

The IoT refers to devices that can transfer data to one another without human intervention and that can provide services such as personal healthcare, smart electricity grids, surveillance, home automation and intelligent transport.

You may already use digital technologies in your own home. For example, you may have a smart or digital meter that monitors your electricity usage and sends updates to your electricity supplier.

Digital technologies

You might also use apps on your smartphone to:

- Monitor the temperature of different rooms in your house and turn the heating on or off, in different areas of the house, if the temperature changes.
- Control lights (smart bulbs) in your home.
- Charge your electric car at a time that works best for you.

Digital technologies

These types of smart devices can enable you to better understand, monitor and reduce your energy consumption.

Data on how we use and consume energy can also be of benefit to companies and governments by providing real time insights.

These can be used to inform policy or to optimise the energy infrastructure.

Other types of digital technologies such as artificial intelligence can also be used by businesses to better understand and support efficient energy production and consumption.

The potential of the digital energy transition

Using digital technologies to better understand and manage your own energy consumption and potentially reduce costs is one aspect of the digital energy transition.

The potential of the digital energy transition

EVERY1

However, the greatest transformational potential for digitalisation is how it can optimise the consumption and production of energy.

The potential of the digital energy transition

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Our transition away from fossil fuels to renewable energy sources by using digital technologies includes the following connected opportunities:

Select each box below to learn more.

- Demand response
- Intermittent renewables
- Smart charging technologies
- Distributed energy resources

Conclusion

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Energy digitalisation can help us better understand and manage our energy consumption.

Digital technologies can provide insights into our own behaviour and enable us to make meaningful changes.

Digital technologies can also benefit businesses and governments by providing real time insights and supporting efficient energy production and consumption.

Conclusion

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As we transition to more sustainable sources of energy, digital technologies and digital services offer the potential for energy systems to be more:

- Connected
- Intelligent
- Efficient
- Reliable
- Sustainable

This course is part of the *Digital Energy Essentials* series.

You may want to explore our course *Why Digitalise Energy?* to find out more about the potential benefits and challenges of energy digitalisation.

Additional resources

Rozite, V., Miller, J. & Oh, S. (2023) Why AI and energy are the new power couple International Energy Agency (IEA).

Chambers, J., Robinson, C. & Scott, M. (2022) Digital Inclusion in the energy system: how do we ensure the opportunities and benefits of digitalisation can be accessed by everyone? Policy Bristol / University of Bristol.

European Commission (n.d.) Digitalisation of the energy system.

Saini, H. (2023) What is digital energy? Learn about its benefits, the different types, and what the future holds ET Edge Insights.

Acknowledgements

What is the digital energy transition? is an adaptation of selected material from the International Energy Association (IEA) Digitisation and Energy Report (2017) (the 'Original Work') which is licensed CC BY-SA 4.0.

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Acknowledgements

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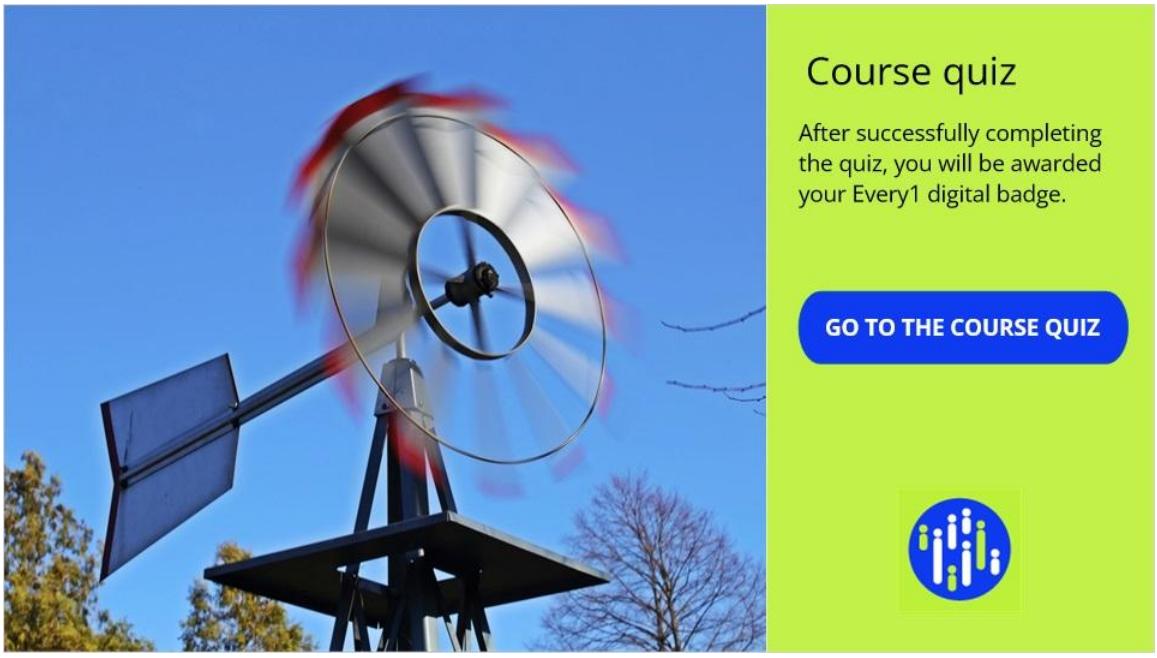

Course quiz

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