smart skills
smart sustainable agriculture

Course 4: Renewable Energy Integration in Agriculture

M4: Government Policies and Incentives for Renewable Energy Adoption

Co-funded by the European Union

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What will you learn?

This module aims to provide a clear understanding of financial support, regulatory frameworks, and future advancements in renewable energy for agriculture. It will **explore various subsidies, grants, and financing options** available to support renewable energy projects, helping stakeholders make informed investment decisions.

You will gain **insight into navigating regulations and ensuring compliance with legal requirements** when implementing renewable energy solutions. Additionally, the module will cover emerging trends, particularly the role of energy storage technologies in enhancing efficiency, reliability, and sustainability in agricultural operations.

By the end of this module, you will have an understanding of how to secure funding for renewable energy initiatives, comply with regulations, and leverage innovative storage solutions to optimise energy use in modern agriculture.

Understand…

… overview of subsidies, grants, and financing options

Identify…

… navigating regulations and compliance for renewable energy projects

Explain…

… future trends: The role of energy storage technologies in agriculture

contents

This module covers government policy and incentives for the use of renewable energy. It provides an overview of subsidies, grants and financing options. We will also look at the provisions of draft legislation on renewable energy. Future trends will also be discussed, including the role of energy storage technologies in agriculture.

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01

OVERVIEW OF SUBSIDIES, GRANTS & FINANCING OPTIONS

Initiatives to support Renewable Energy

In countries such as Poland, Ireland, Italy, Slovakia, the Czech Republic and Denmark, there are various financial support programmes, subsidies and grants available to promote investment in renewable energy sources (RES).

See the following slides for more information.

Poland

➔ **The ‘Energy for Rural Areas’ programme**: Aimed at farmers and energy cooperatives, it supports the construction of photovoltaic and wind power installations, hydroelectric power plants, biogas plants and energy storage facilities- More information

➔ **Biomethane Support Scheme:** Includes provisions for direct pipeline connections for biogas transport. This program is part of a broader strategy for energy security, energy transition, and support for agriculture - More information

➔ **Development of small farms.** This program offers a non-repayable grant of up to PLN 120,000. These funds can be used for investments that increase the competitiveness and efficiency of the farm, such as the purchase of agricultural machinery, infrastructure modernization, or the development of organic production- More information

Ireland

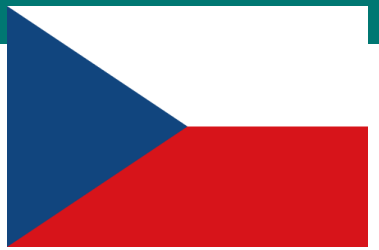
- **Non-Domestic Microgen Grant (NDMG)-** Financial assistance for businesses and farms to install solar PV panels.Grants available for systems up to 1000kWp, with funding up to €162,500 - More Information
- **Solar Capital Investment Scheme (SCIS) under TAMS 3-** Provides up to 60% grant aid for solar PV systems for eligible farmers - More information
- **Investment Aid for Energy Efficiency in Mushroom Production:** Capital grant aid up to 40% for approved investments; young farmers may receive up to 60% - More information

Italy

- **Regenerative Farming Initiatives in Veneto and Friuli:** Collaborative projects promoting regenerative agriculture, integrating renewable energy practices - More Information
- **Agrivoltaic Projects:** Innovative integration of solar panels with agriculture, enhancing crop quality and energy production - More Information
- **EAFRD Loan Fund for Agriculture in Friuli Venezia Giulia:** Financial instruments supporting agricultural investments, including renewable energy projects - More Information:

Slovakia

- **CAP Strategic Plan 2023–2027:** Investment Support for Renewable Energy This initiative aims to enhance energy self-sufficiency and efficiency in the agricultural sector. - More information
- **Agri-Photovoltaics (Agri-PV) Initiatives:** This approach allows for dual land use, enhancing land productivity and energy generation - More information



Czech Republic

- **Agrivoltaics Legislation:** New laws permitting agrivoltaic installations on various crop types, promoting dual land use - More Information
- **Biomass Support Scheme:** €20 million allocated to support energy production from biomass within the agri-food sector - More information
- **Operational Programme Technologies and Applications for Competitiveness (OP TAK):** Supports renewable energy projects, including those in agriculture, to enhance competitiveness - More Information:

Denmark

➔ **The Green Fund**: The fund allocates approximately 161 million euros for the implementation of the first phase of the Climate Adaptation Plan, which aims to protect coasts, cities and infrastructure from the effects of climate change. Link

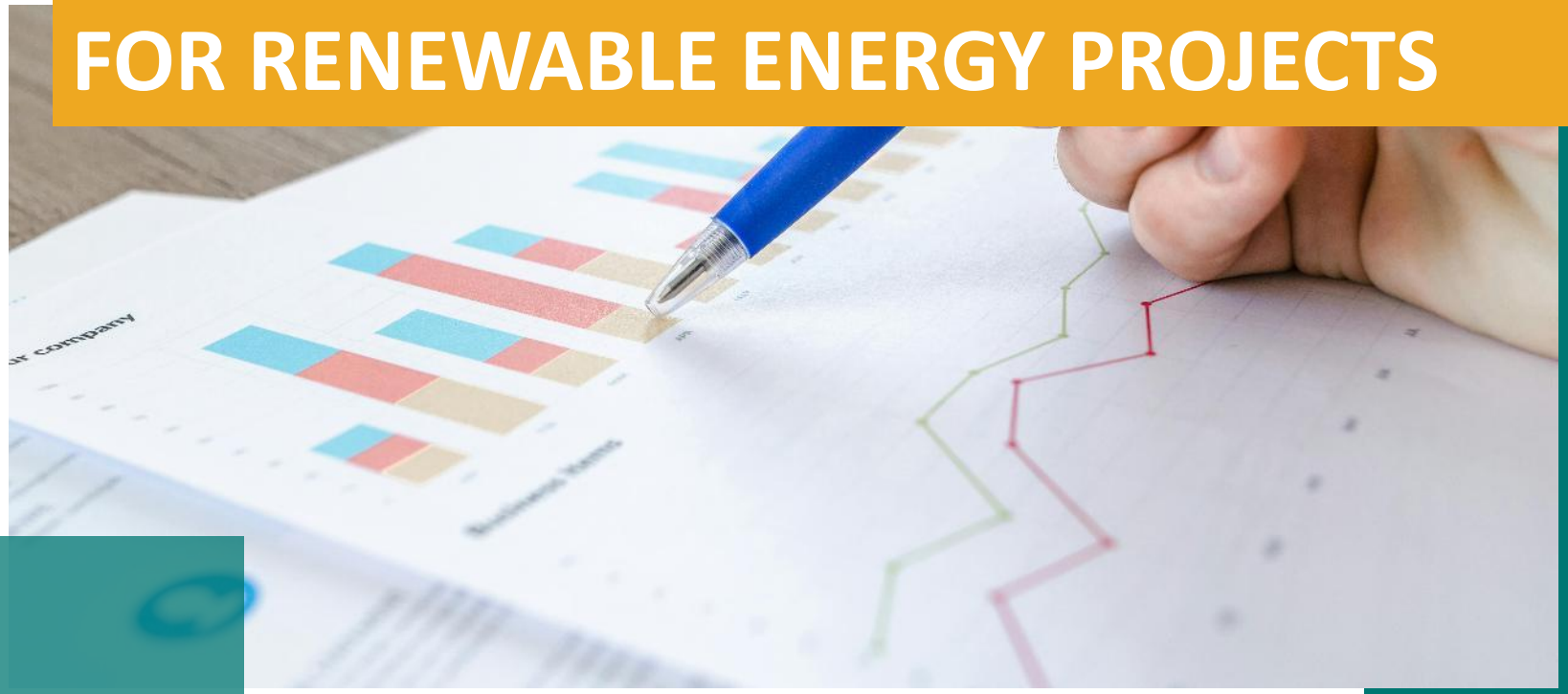
➔ **Support programmes for renewable energy projects**: The Danish government has granted financial support to five projects with a total value of DKK 4.2 billion (approx. EUR 563 million), focusing on renewable energy. Link , Link, Link

➔ Green Triparite Agreement link

➔ Bioenergy from Agriculture: Supports the use of agricultural by-products like manure and straw for biogas and biofuel production. Link

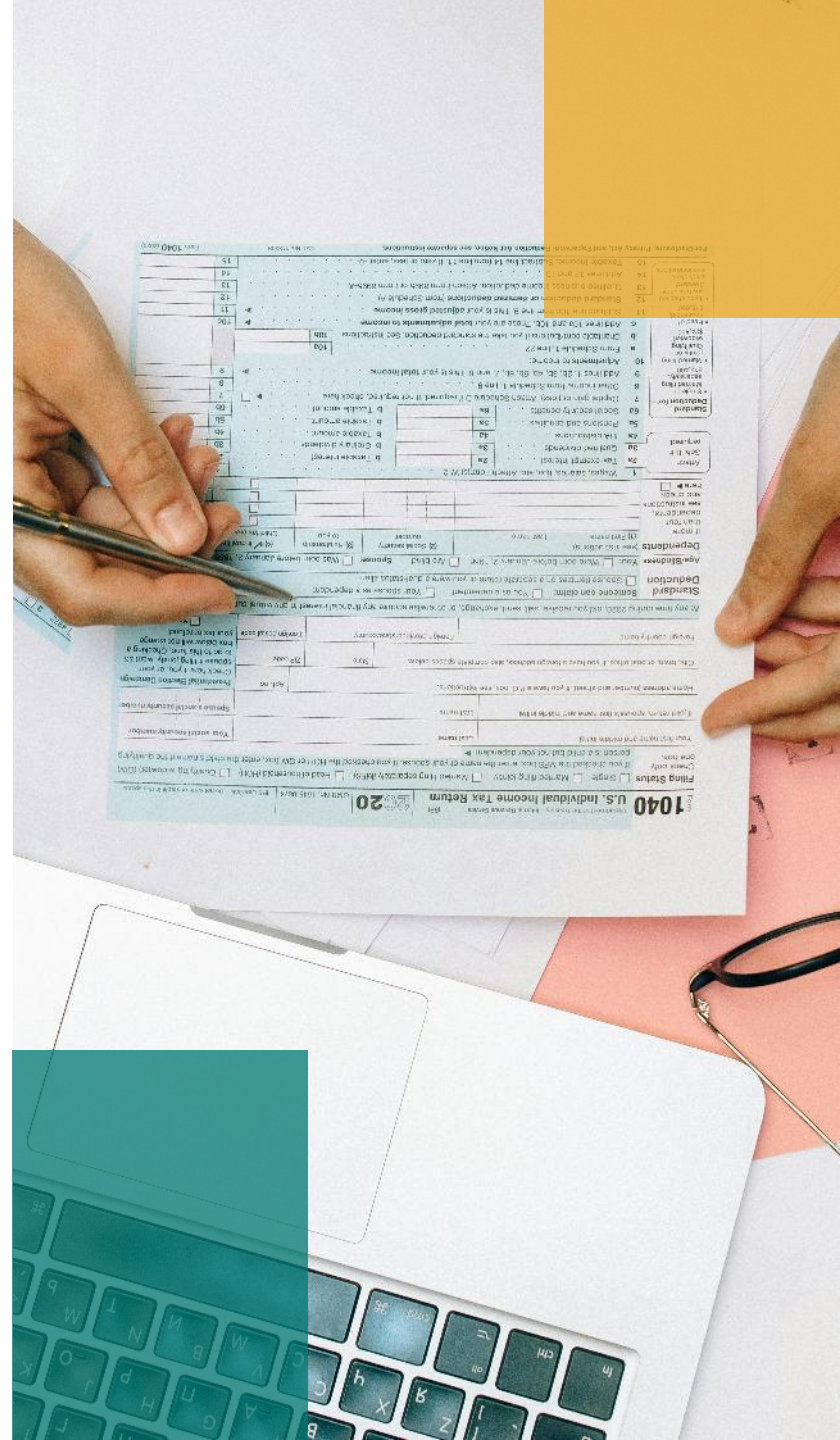
02

NAVIGATING REGULATIONS AND COMPLIANCE FOR RENEWABLE ENERGY PROJECTS



Introduction

Projects involving renewable energy sources (RES) have to meet specific legal and regulatory requirements. Regulations differ from country to country, but in most cases, they cover aspects related to permits, environmental standards, support systems and regulations concerning connection to the power grid.



Key areas of regulation for renewable energy projects

Administrative permits and approvals

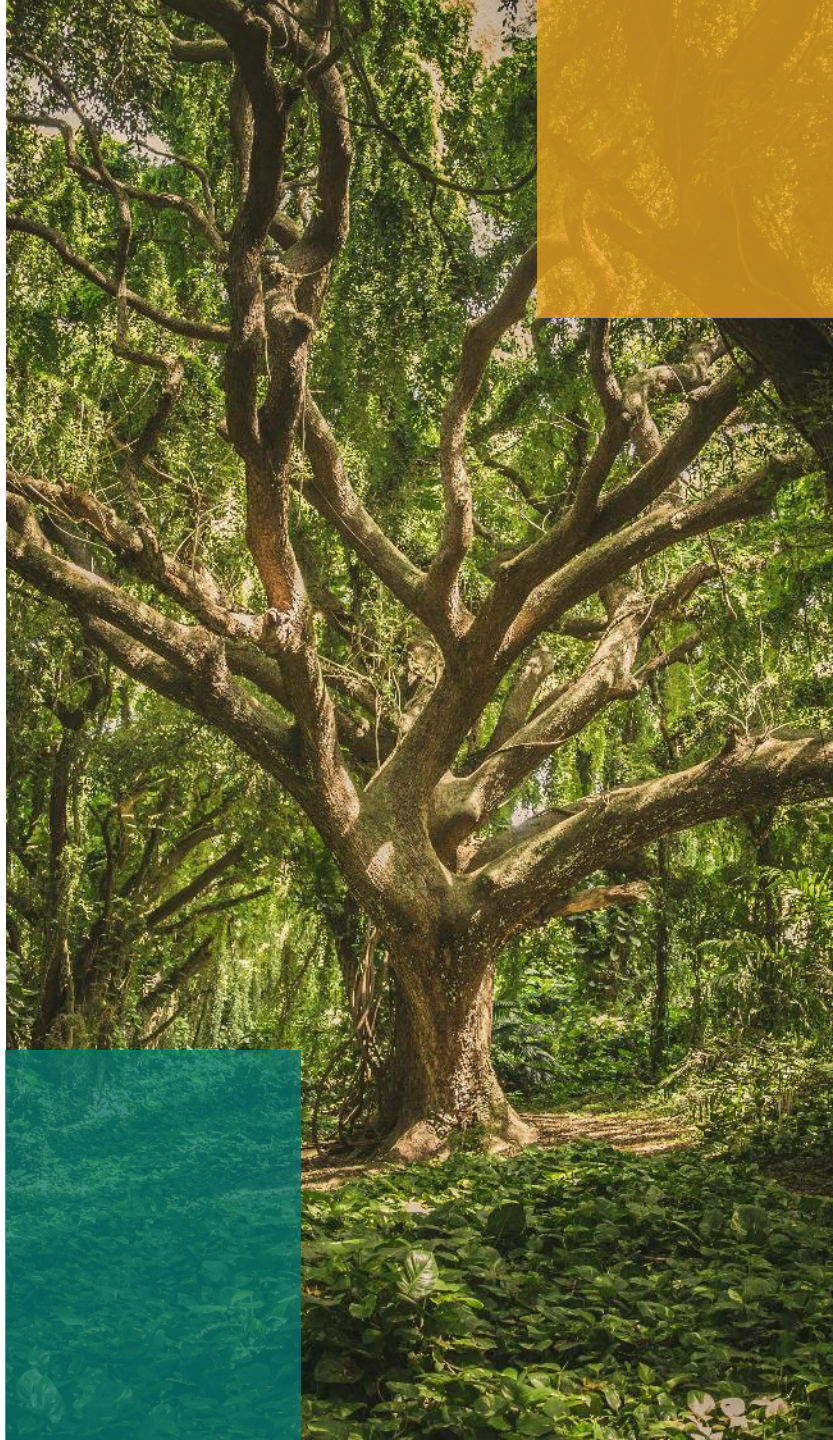
Before starting a renewable energy project, it is necessary to obtain the appropriate permits:

- **Building permits** – required for wind farms, biogas plants, or larger photovoltaic installations. In some countries, a notification is sufficient for small installations (e.g. micro PV installations).
- **Environmental impact decision** – necessary for larger projects, especially those that could affect the surrounding ecosystem.

Environmental standards and nature conservation

Renewable energy projects must comply with environmental regulations such as

- The European Union's Renewable Energy Directive link , link
- The Industrial Emissions Directive link , link
- The protection of Natura 2000 areas (for projects that may affect protected species and habitats) link



03

FUTURE TRENDS: THE ROLE OF ENERGY STORAGE TECHNOLOGIES IN AGRICULTURE

The key role of energy storage in agriculture

In agriculture, energy needs are irregular – for example, irrigation systems require large amounts of energy during droughts, and heating greenhouses becomes crucial in winter.

Energy storage enables:

- **Stabilisation of energy supply** – use of stored energy during low generation from renewable energy sources.
- **Reduction of energy costs** – avoid high peak-time tariffs by using your own supply.
- **Increase energy independence** – reduce dependency on the power grid and fluctuating electricity prices.

Modern energy-storage technologies in agriculture

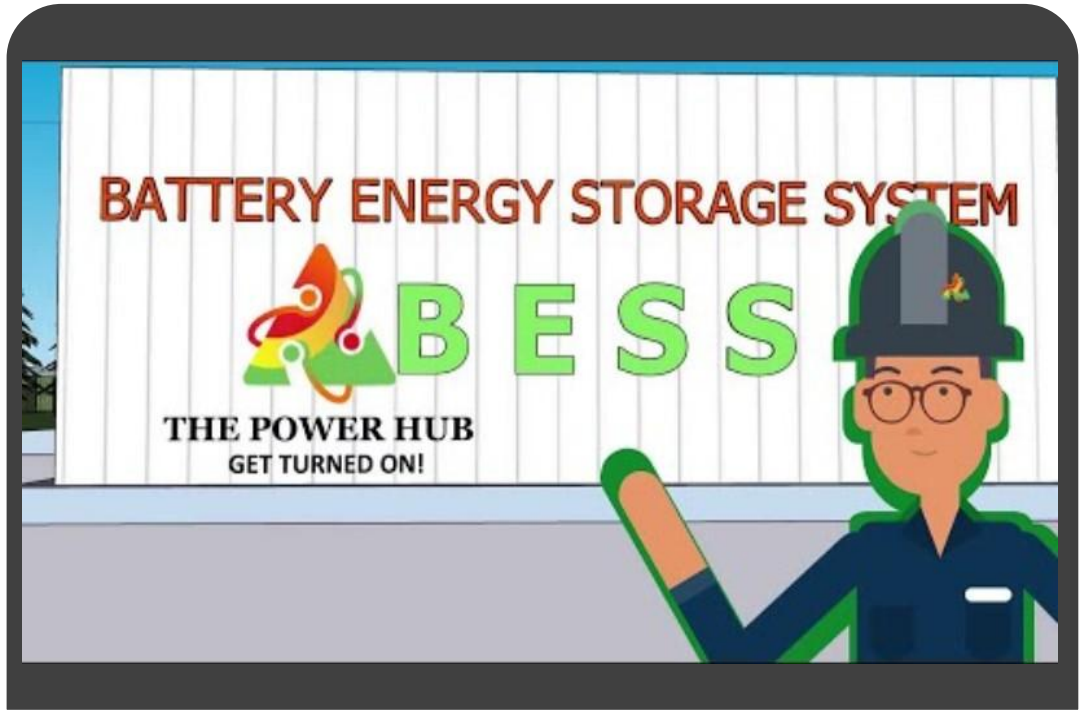
Lithium-ion batteries - The most developed technology used in energy storage. It is characterised by high energy density, long service life and high efficiency. Used to store surplus energy from PV systems and wind farms.

Flow batteries - Ideal for long-term energy storage, they are highly scalable and can be recharged multiple times without losing capacity. They are particularly useful on farms with highly variable energy production and consumption.

Hydrogen storage systems - Hydrogen as an energy storage medium is gaining popularity, as it enables the storage of renewable energy surpluses and their use as fuel for agricultural machinery.

Thermal energy storage - Heat accumulators, in the form of water or molten salt tanks, allow the storage of energy for heating greenhouses or farm buildings.

More information on Energy Storage Systems



If you want to learn more about modern energy storage technologies in agriculture, click on the link below

← Battery Energy Storage Systems (BESS)

04

LET’S PRACTICE

Drag the descriptions below and match them to the right area:

Finance, Regulations, Energy Storage

It stabilises energy supply on cloudy or windless days - _____

It requires consultation with local authorities and often an environmental impact report - _____

It includes EU funds such as the Rural Development Programme (RDP) - _____

It promotes energy independence and increases resilience to power outages - _____

Includes the necessity to comply with building and energy regulations - _____

Facilitates the purchase and installation of RES through subsidies and preferential loans - _____

Solution to the drag and drop exercise

Financing

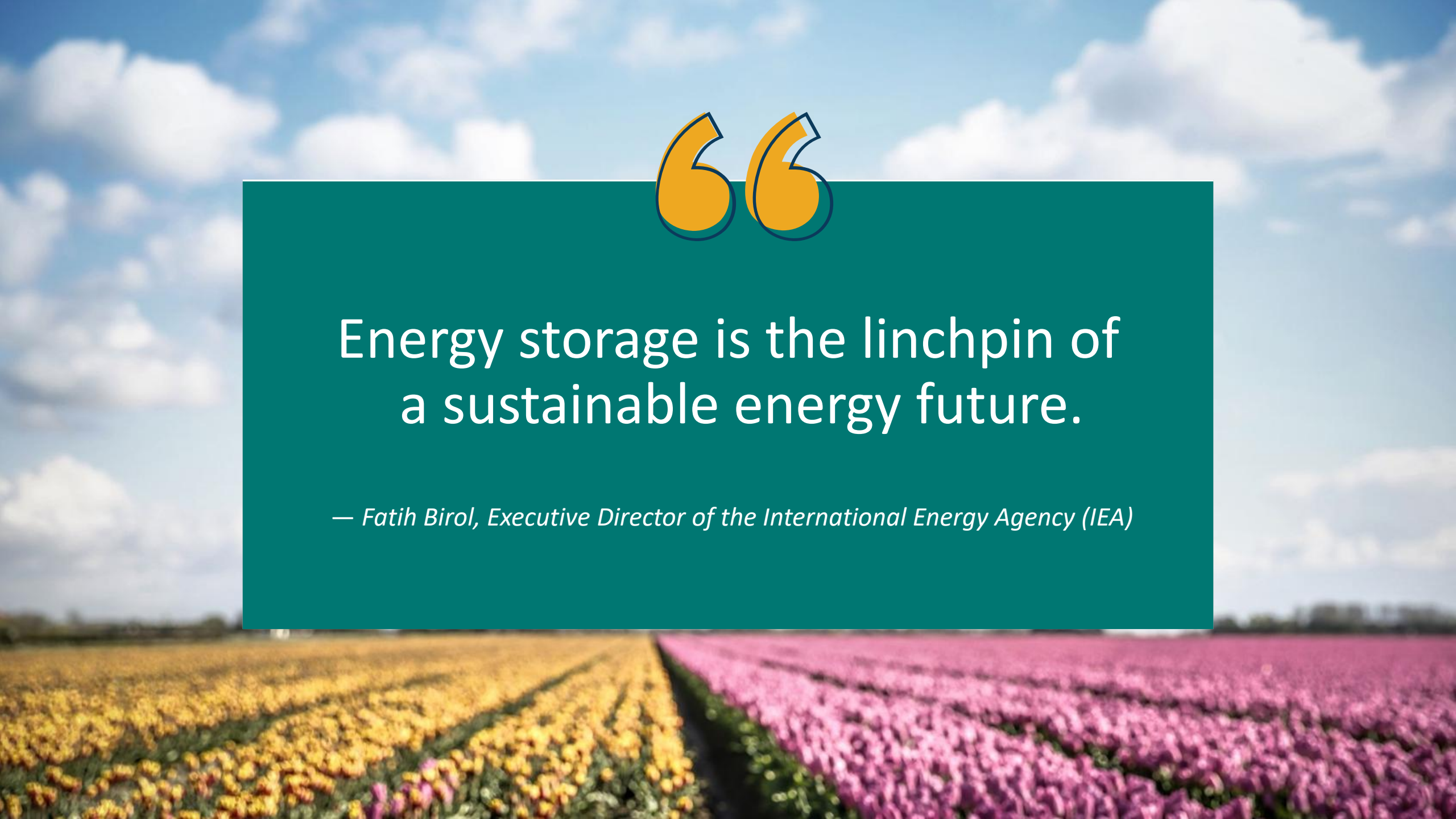
- Includes EU funds such as the Rural Development Programme (RDP).
- Facilitates the purchase and installation of RES through subsidies and preferential loans.

Regulations

- Requires consultation with local authorities and often an environmental impact report.
- Includes the necessity to comply with building and energy regulations.

Energy storage

- Allows for stabilisation of energy supply on cloudy or windless days.
- Supports energy independence and increases resilience to power outages.


Energy storage is the linchpin of a sustainable energy future.
— Fatih Birol, Executive Director of the International Energy Agency (IEA)

Well Done!!!

You finished **Course 4**!

Why not now test your knowledge by taking related quiz!!

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