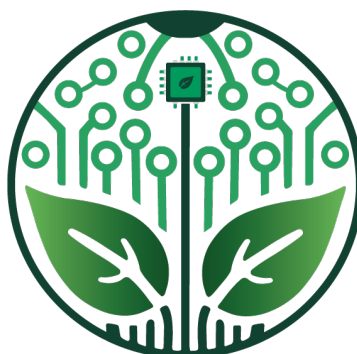




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## [LESSON PLAN]

# Data on Sustainability and AI in Energy

|                                                                                                                                      |                                                                                                                                        |                                                                                                                                                      |                                                                                                                                                      |                                                                                                                            |                                                                                                                              |                                                                                                                                                                      |
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## Disclaimer



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## 1. TITLE

Data on Sustainability and AI in Energy

## 2. GRADE LEVEL

- ☐ ISCED Level 2 – Lower Secondary Education (ages 12–15)
- × ISCED Level 3 – Upper Secondary Education (ages 15–18)

## 3. SUBJECT AREA

- × Environmental Studies
- × Economics
- × Computer Science
- ☐ Mathematics
- ☐ Sciences
- ☐ Geography
- × Technology and Design
- ☐ History
- ☐ Social Studies
- ☐ Arts and Music
- ☐ Languages

## 4. TYPE

- × Lesson Plan
- ☐ Project

## 5. DURATION

- ☐ 1 x 40-50minute class
- ☐ 1 x 60-minute class
- ☐ 1 x 80-100-minute block
- × 2 x 45-minute classes
- ☐ 2 x 60-minute classes
- ☐ Double session (2 × 60 minutes) optional project-based homework.



## 6. LEARNING OBJECTIVES

By the end of the lesson, students will be able to:

- O1 - explain how artificial intelligence supports forecasting, optimization, and sustainability in modern energy systems.
- O2 - identify and describe key AI applications such as demand forecasting, grid optimization, renewable energy prediction, and predictive maintenance.
- O3 - analyze opportunities and challenges associated with the use of AI in the energy sector, including data quality, transparency, and regulatory aspects.
- O4 - evaluate how AI-driven innovations can contribute to reducing CO<sub>2</sub> emissions and improving energy efficiency.

## 7. Key Competences Developed

- Literacy
- Multilingual competence
- × Mathematical competence and competence in STEM
- × Digital competence
- × Citizenship competence
- × Cultural awareness and expression competence
- Entrepreneurship competence
- Personal, social and learning to learn competence

## 8. Prior Knowledge / Prerequisites

- Basic Statistical Knowledge
- No prior knowledge of AI required

## 9. Lesson/Project Outline

### Phase 1 – Introduction

Time: 40 minutes

#### Suggested Components

A frontal presentation of the provided data on the topic of sustainability. After each slide, ask the audience whether they were previously aware of this or whether they had a different opinion about it.

**Guiding Questions**

- How is the status of the global warming?
- How are global CO<sub>2</sub>-Emissions developing?
- What is the status quo of energy consumption, globally and in Europe?

| Resource (name)          | Link (to the folder on Teams)                                |
|--------------------------|--------------------------------------------------------------|
| Presentation: Slide 1-18 | <a href="#">Data on Sustainability and AI in Energy.pptx</a> |

**Phase 2 – Outlook of AI in Energy Consumption and Optimization**

Time: 40 Minutes

Presentation of the outlook of AI-usage in Energy Transition. This should also serve as an outlook on the other teaching materials provided. Therefore, these should also be reviewed as part of the preparation.

**Guiding Questions**

- How does artificial intelligence improve efficiency and sustainability in modern energy systems?
- Which AI applications have the greatest potential to transform energy production, distribution, or consumption—and why?
- What risks or challenges arise when integrating AI into critical energy infrastructure, and how can they be addressed responsibly?

| Resource (name)           | Link (to the folder on Teams)                                |
|---------------------------|--------------------------------------------------------------|
| Presentation: Slide 19-27 | <a href="#">Data on Sustainability and AI in Energy.pptx</a> |

**Phase 3 – Knowledge Check / Discussion**

Time: 10 minutes

The following questions should be discussed in the plenary:

1. How can AI improve energy demand forecasting accuracy?
2. Name two ways AI supports renewable energy generation.
3. What role does AI play in predictive maintenance?
4. What is one major challenge when deploying AI in the energy sector?
5. How can AI contribute to CO<sub>2</sub> reduction strategies?



| Resource (name)        | Link (to the folder on Teams)                                |
|------------------------|--------------------------------------------------------------|
| Presentation: Slide 28 | <a href="#">Data on Sustainability and AI in Energy.pptx</a> |

## Teaching Materials

| Name             | Type<br>(Developed/Existing) | Link                                                         | Role in<br>the<br>lesson |
|------------------|------------------------------|--------------------------------------------------------------|--------------------------|
| Teacher slides   | pptx                         | <a href="#">Data on Sustainability and AI in Energy.pptx</a> | Main                     |
| Reflection Sheet | docx                         | <a href="#">Reflection_AIEnergy.pdf</a>                      | Main                     |