AI-GREENER
2024-1-AT01-KA220-SCH-000248327

AI-GREENER
2024-1-AT01-KA220-SCH-000248327

[LESSON PLAN]

Data on Sustainability and AI in Energy

QUADRAT HAK × HLW Bundeshandelsakademie Wolfsberg Austria	Darica İlçe Milli Eğitim Müdürlüğü Turkey	CAMPUS 02 Campus 02 Fachhochschule der Wirtschaft GmbH Austria	Directorate of Secondary Education of Kefallinia Greece	Jaunpiebalgas vidusskola Latvia	sucessos criativos Sucessos Criativos, Lda Portugal	Sredno obshtoobrazovatelno uchilishte Lyuben Karavelov Bulgaria

AI-GREENER

2024-1-AT01-KA220-SCH-000248327

Authors

Campus 02 AUS

Selver Softic
Safet Softic
Yevheniia Andriichenko
Berndt Jesenko
Ioan Turcin

Disclamer

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Education and Culture Executive Agency (EACEA). Neither the European Union nor EACEA can be held responsible for them.

1. TITLE

Data on Sustainability and AI in Energy

2. GRADE LEVEL

- [ ] ISCED Level 2 – Lower Secondary Education (ages 12–15)
- [x] ISCED Level 3 – Upper Secondary Education (ages 15–18)

3. SUBJECT AREA

- [x] Environmental Studies
- [x] Economics
- [x] Computer Science
- [ ] Mathematics
- [ ] Sciences
- [ ] Geography
- [x] Technology and Design
- [ ] History
- [ ] Social Studies
- [ ] Arts and Music
- [ ] Languages

4. TYPE

- [x] Lesson Plan
- [ ] Project

5. DURATION

- [ ] 1 x 40-50minute class
- [ ] 1 x 60-minute class
- [ ] 1 x 80-100-minute block
- [x] 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_2 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 CO2-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	Data on Sustainability and AI in Energy.pptx

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	Data on Sustainability and AI in Energy.pptx

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_2 reduction strategies?

Resource (name)	Link (to the folder on Teams)
Presentation: Slide 28	Data on Sustainability and AI in Energy.pptx

Teaching Materials

Name	Type (Developed/Existing)	Link	Role in the lesson
Teacher slides	pptx	Data on Sustainability and AI in Energy.pptx	Main
Reflection Sheet	docx	Reflection_AIEnergy.pdf	Main