AI-GREENER
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LESSON PLAN

Smart Grids, Sustainability and Globalization (Green IT)

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

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Disclamer

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1. TITLE

Smart Grids, Sustainability and Globalization (Green IT)

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

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

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

- O1- Explain the concept of **Green IT** and describe how IT can contribute to sustainability.
- O2- Identify examples of **energy-efficient technologies** in data centers, workplaces, and mobility.
- O3 - Understand the role of **Smart Grids** in optimizing energy production and consumption.
- O4 - Reflect on social and environmental challenges such as **greenwashing** and the **rebound effect**.

7. Key Competences Developed

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

8. Prior Knowledge / Prerequisites

Basic understanding of computers, networks, and sustainability issues; none specific required.

9. Lesson/Project Outline

Phase 1 – Introduction (Engage & Contextualize)

Purpose: Activate prior knowledge and motivate interest.

Activities:

- Show short intro video "What is Green IT?" (< 3 min)
- Class discussion: "How can IT both help and harm the environment?"
- Present key terms (Energy Star, Recycling, Eco-Label etc.) using slides 3 – 8

Expected Output: Students list examples of Green IT applications.

Resource (name)	Link (to the folder on Teams)
Slides 3 – 8	**Smart Grids, Sustainability and Globalization (Green IT) (Slides) – in folder**
Video "What is Green IT?"	**https://www.it-talents.de/blog/it-talents/was-ist-eigentlich-green-it**

Phase 2 – Exploration (Investigate & Compare)

Purpose: Analyze sustainability measures in IT systems.

Activities:

- Group reading of selected slides 11 – 18 (energy management, workplace measures).
- Teams identify which actions reduce carbon footprint → present in 2 min summary.
- Discuss Greenwashing & Rebound Effect (slides 37 – 38).

Expected Output: Mini-poster or Padlet listing "Top 5 Sustainable IT Practices".

Resource (name)	Link (to the folder on Teams)

Slides 11 – 18 + 37 – 38	**Smart Grids, Sustainability and Globalization (Green IT) (Slides) – in folder**
Wikipedia Greenwashing	**https://de.wikipedia.org/wiki/Greenwashing**
Worksheet "Top 5 Practices" (DOCX)	**In folder**
LearningApp "Green IT Match Up"	**https://learningapps.org/43294917**

Phase 3 – Application (Hands-On Practice)

Purpose: Apply knowledge to real or simulated situation.
Activities:

- Small groups analyze a **Smart Grid** scenario using slides 28 – 32.
- Each group maps energy flows between producers and consumers.
- Watch video "Smart Grid in 3 Minutes explained" and compare to diagram.
- Optional: Design a "Smart School" concept (reduce IT energy use).

Expected Output: Sketch or digital poster of Smart Grid ecosystem.

Resource (name)	Link (to the folder on Teams)
Slides 28 – 32 + 40 -45	**Smart Grids, Sustainability and Globalization (Green IT) (Slides) – in folder**
Video Smart Grid	**https://www.youtube.com/watch?v=dvB-vJjzv-s**
LearningApp "Smart Grid Flow Order"	**https://learningapps.org/43295469**

Phase 4 – Reflection & Consolidation (Present & Connect)

Purpose: Summarize findings and connect to sustainability goals.
Activities:

- Short group presentations (2 min each).
- Class discussion: "How can AI support greener energy systems?"
- Individual reflection (½ page): "What was new for me and why does Green IT matter?"

Expected Output: Personal reflection sheet + presentation slides.

Resource (name)	Link (to the folder on Teams)
Reflection Template (DOCX)	**In folder**

10. Assessment Criteria

Method	Description
Quiz	5 multiple-choice questions on key concepts (Green IT, Smart Grids)
Peer Review	Groups evaluate each other's Smart Grid poster
Reflection	Self-assessment via learning journal
Portfolio	Screenshots or photos of group outputs

Resource (name)	Link (to the folder on Teams)

11. Teaching Materials

Name	Type (Developed/Existing)	Link	Role in the lesson
Smart Grids, Sustainability and Globalization (Green IT) (Slides)	**Developed**	**in folder**	**Core visual material**
Videos (Green IT, Smart Grid)	**Existing**	**see links**	**Motivation and**

			illustration
Worksheet “Top 5 Practices”	Developed	In folder	Group activity
Reflection Template	Developed	In folder	Individual reflection
Learning Apps	Developed	https://learningapps.org/43294917, https://learningapps.org/43295469	Individual reflection

12. External Resources and References

Resource (name)	Link (external or to the folder on Teams)
Wikipedia Smart Grid	https://en.wikipedia.org/wiki/Smart_grid
Farmmanagement.pro (Precision Farming)	https://www.farmmanagement.pro/technology-essentials-for-precision-farming/
Iberdrola Smart Farming	https://www.iberdrola.com/innovation/smart-farming-precision-agriculture