STIAEM — Open Educational Resource (OER) Repository for AI

Metadata Sheet — WP2 / Erasmus+ KA220-SCH, ref. 2025-1-IT02-KA220-SCH-000365213

OER 5.3.1

Environmental Footprint of Generative AI: Energy and Water Demands of Data Centres

Identifier	OER 5.3.1
Title	Environmental Footprint of Generative AI: Energy and Water Demands of Data Centres
Creator	Konak Science and Art Center (BILSEM) - Türkiye
Description	The resource makes comprehensible the environmental footprint of generative AI: how much energy it consumes, how many emissions it produces, and how much water and material resources it requires. It distinguishes the layers of the footprint — energy, carbon, water and materials — and introduces computational efficiency (Green AI) as a didactic criterion, with the concrete case of BLOOM. The practical focus is on what can be done in the classroom, linked to DigComp 3.0 competence 4.4.
Keywords	environmental footprint; energy consumption; carbon emissions; water use; data centres; Green AI; computational efficiency; sustainability
Language	EN (English)
Affiliation	Konak Science and Art Center (BILSEM) - Türkiye
Contributor	STIAEM Transnational Scientific Board (peer review, Rhodes validation protocol)
Media Format	Text; Infographics
Genre	Training Manual; Educational Guide
URL	https://www.stiaemproject.eu/?oer_download=OER-5.3.1
Citation	Konak Science and Art Center (BILSEM). (2026). Environmental Footprint of Generative AI: Energy and Water Demands of Data Centres [Educational guide]. Slow Tech Innovation: AI, Ethics, and New Teaching Methods (STIAEM), 2025-1-IT02-KA220-SCH-000365213.
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	Strubell, E., Ganesh, A., & McCallum, A. (2019). Energy and policy considerations for deep learning in NLP. In Proceedings of the 57th Annual Meeting of the Association for Computational Linguistics (pp. 3645-3650). https://aclanthology.org/P19-1355/
Educational Level	Secondary School
Associated Module / MOOC Video Lesson	Module 5 - Safety, Privacy and Sustainability / Video 5.3 - Ecological Footprint & Civic Education
Learning Objectives	Explain with concrete data the energy and emissions cost of training and using AI models; distinguish the different layers of the footprint: energy, carbon, water and material resources; use the concept of computational efficiency (Green AI) as a criterion for didactic choices.
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