FWF Austrian Science Fund

Recommendations for Sustainable AI Use

The use of artificial intelligence (AI) requires considerable amounts of energy and resources, including electricity, water for cooling, raw materials, and land for data centers. This results in a number of negative environmental impacts, such as greenhouse gas emissions, high water and energy consumption, soil sealing, raw material extraction, and electronic waste.*

In the interest of ecological sustainability, AI should therefore be used mindfully and only when it offers a clear added value. The following five principles can help you decide how and when to use AI effectively in your everyday work.

1) Use AI only when you really need it.

- If another, more traditional tool can be used to complete the task (e.g., a calculator, spell checker, or simple web search), use this instead of AI.
- Keep in mind that generating images is more energy-intensive than generating text.
- Generating video is even more energy-intensive.

2) Choose the right AI for the job.

- Select models and tools that are as resource-efficient as possible; smaller models use fewer resources.
- Avoid using agents for simple tasks, as they can trigger multiple background requests and significantly increase resource use.

3) Keep prompts clear, precise and focused.

- Formulating your prompts as precisely as possible reduces unnecessary use of resources.
- Upload only the documents or sections of documents that are actually needed for your specific request.
- Request short and concise answers, for example, “no more than five bullet points.”

4) Use AI efficiently and avoid unnecessary interactions.

- Avoid unnecessarily long conversations and repeated prompts. Each request requires additional processing power.
- Keep the context relevant and remove unnecessary information where technically feasible.
- Review results critically before asking for further iterations or regenerating content.
- Save useful results locally or in the designated work environment to avoid generating the same content again.

- Close AI applications after completing the task, where technically possible.

5) Think critically and verify.

- Keep data protection and confidentiality in mind: Depending on the AI system, uploaded data may be stored, processed, or used to further train the AI model. Your organization's data protection and confidentiality policies apply to AI use.
- Use AI to confirm or support your own professional judgment and independent thinking, not to replace them. Independent judgment and critical analysis are especially important in research and science.
- Always verify AI-generated content, as it may contain errors or inaccuracies.

*** Additional information**

- CO_2 and water footprint calculator for AI use: A calculator that compares the CO_2 and water footprints of AI use (ChatGPT, Claude, Gemini) with your own: AI carbon & water footprint calculator – Andy Masley
- Resource consumption of various AI models: Comparison of the resource intensity of different AI models: AI Energy Score Leaderboard – Hugging Face
- Infographic on the resource consumption of generative AI: Tallerstampa (2024): Cartography of Generative AI
- Aczel, M., Chamanara, S., Matin, M., Farsi, A., Marwala, T. &, Madani, K. (2026): *Environmental Cost of AI's Energy Use: Carbon, Water, and Land Footprints*. United Nations University Institute for Water, Environment, and Health (UNU-INWEH), Richmond Hill, Ontario, Canada. DOI 10.53328/INR26RMA002.