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AI and the Invisible Energy Flow: Why Transparency and Equal Metrics Are Becoming Critical

The discussion about the energy consumption of artificial intelligence (AI) in data centers is no longer academic. While the world is fascinated by the possibilities of generative AI, electricity demand is quietly growing explosively. The reality is that today's digital progress is directly translated into a physical energy demand that puts pressure on existing infrastructures.

According to recent analyses by the International Energy Agency (IEA), global electricity consumption by data centers, largely powered by AI, could nearly triple to 945 TWh per year by 2030. This is comparable to the total electricity consumption of countries such as Germany or Japan. However, transparency about this consumption remains limited, and there is a lack of harmonised measurement standards that are necessary to guide responsible growth.

The electricity issue: from data to megawatts

AI suddenly makes electricity tangible. Every new AI model, every query, every dataset translates into a chain of servers, GPUs, and cooling systems that run day and night. Where traditional workloads were often predictable, AI leads to erratic, intensive peaks.

In the Netherlands alone, it is estimated that total electricity demand from data centers — partly due to AI development — could increase by more than 60% in the next five years. At the same time, we see that the grid capacity is already fully utilised at many locations.

The challenge is clear: how do we measure and manage this growth if the sector itself does not use unambiguous metrics?

Lack of transparency: a new kind of invisible emission

Whereas we have been reporting CO₂ emissions and energy efficiency as standard in traditional industries for decades, the AI industry continues to operate largely in the fog. Most AI providers publish only patchy data on their energy and water use, often without context or comparison.

A telling example: Google reported that an AI query to *Gemini* emits only 0.03 grams of CO₂. But what is missing is a clear comparison — how much energy was used in model training, data center cooling or transporting data? Without transparent and comparable measurement methods, such figures remain symbolic rather than guiding.

We are dealing with digital emissions without clarity, a problem that is very reminiscent of the situation before Dieselgate: nice figures, without verifiable substantiation.

The need for standardized metrics

To understand the true impact of AI on the power grid, standardized metrics are crucial. Concepts such as PUE (Power Usage Effectiveness) are no longer sufficient, as they do not distinguish between AI and non-AI loads, nor do they take into account regional differences in infrastructure or energy sources.

What is needed are new metrics that take into account:

- AI-specific energy use (training vs. inference);
- Carbon intensity by region (solar, wind, or fossil mix);
- Water consumption per kWh of IT load;
- And above all: comparability between providers.

Only with such a level playing field can policymakers, companies and users make truly sustainable choices.

A new energy ethic for AI

The sector has a moral responsibility not only to innovate, but also to provide insight into the true costs of that innovation. When tech companies talk about "AI for sustainability" but don't publish full energy reports, a credibility gap is created.

It is time for an energy ethic within AI: an obligation to openness, comparability and accountability. Governments could introduce minimum standards, similar to the CO₂

reports in industry. In turn, grid operators and energy companies can make better predictions and target investments where growth is greatest.

Conclusion: the smartest AI is the transparent AI

The energy increase due to AI is not a surprise — the lack of insight is. Without clear metrics, we remain blind to the real impact on our electricity grid and our climate goals. Transparency is not just a reporting obligation, but a prerequisite for sustainable growth. The AI of the future must not only be smarter, but also more honest about its energy hunger. As Dieselgate taught us: what we don't measure, we can't trust.