EQS-News: From data centers to nuclear power: How AI is driving the nuclear energy renaissance

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The tech giants of our time have committed to cleaner operations in the future. In 2019, Amazon announced that it would offset all of its electricity consumption with renewable energy by 2030. Last year, Amazon reported that it had achieved its energy targets. Elsewhere, comparable successes have yet to be seen.

Google's Environmental Report shows that the tech company not only had difficulties achieving its energy targets, but also emitted 13% more greenhouse gases in 2023 than in the previous year. In addition to emissions from the supply chain, data centers are primarily responsible for this.

In this article, we explain why data centers are increasingly impacting the energy targets of tech companies, why nuclear energy is seen as a savior, and what a Canadian exploration company has to do with it.

AI applications as energy guzzlers

The International Energy Agency has long been aware of the immense power consumption of data centers. In a report last year, it identified data centers, artificial intelligence (AI) and cryptocurrencies as the main reasons for the increasing power consumption in many parts of the world. According to the report, this would double by 2026.

According to the International Energy Agency, data centers could consume up to 1,000 terawatt hours worldwide by 2026. By way of comparison, this electricity consumption would be equivalent to the total electricity consumption of Japan. The role of AI applications in the total electricity consumption of data centers should not be underestimated.

Google searches driven by AI alone could consume up to 29 terawatt hours of electricity per year in the future - and that's just a fraction of actual AI usage. This was the conclusion reached by data scientist Alex de Vries in an extrapolation. To put this into perspective, this electricity consumption would be equivalent to that of the Republic of Ireland.

The immense power consumption of applications does not just start with use, but already with the operation of training models, which are what get generative AI technologies up and running in the first place. Training the GPT-3 version of OpenAI's ChatGPT alone consumed 1,287 megawatt-hours of electricity. The newer GPT-4 model is likely to have consumed significantly more.

The search for reliable, clean energy sources

Both Google and OpenAI are aware of the increasing power consumption caused by AI applications, which is why they have recently been looking for a reliable, clean energy source. They are increasingly bringing nuclear energy into the conversation as a possible solution. OpenAI CEO Altman spoke out in favor of more trust in nuclear energy at a Bloomberg event last spring. More climate-friendly energy sources would be needed for tomorrow's AI industry.

Nuclear power is not only a clean solution, but also a reliable one. Nuclear power has particularly low CO2 emissions. At around 12 gCO2 per kWh, it is about as low as wind power and significantly lower than solar and hydroelectric power.

Nevertheless, based on its capacity factor, electricity from nuclear power is many times more reliable than wind, solar or hydroelectric power. The capacity factor describes the proportion of the year that an energy source actually produces electricity at full capacity. The capacity factor for nuclear power is 92.5%. For wind power, it is only 35.4%, for solar energy 24.9% and for hydroelectric power 41.5%.

The renaissance of nuclear energy?

Both OpenAI and Google have already taken their first steps towards a future with nuclear power. In addition to his role at the AI company, OpenAI CEO Altman is also taking on the role of chairing a nuclear power startup called Oklo. This startup is working on the development of the first 'liquid metal-cooled sodium fast reactor', the first of which is to be built as early as 2027.

In October 2024, Google announced that it would be working with the energy company Kairos Power. The company will supply the tech giant with so-called Small Modular Reactors (SMRs), the first of which is expected to be connected to the grid as early as 2030 and contribute to Google's electricity supply.

Although nuclear power has been on a global downward trend for years and recently accounted for less than 10% of the global electricity mix, the UN and more than 30 countries have recently called for greater nuclear power production. This renaissance is likely to be driven not only by existing technology, but also by the new technologies described above.

France, a vocal supporter of nuclear power at the UN climate summit, currently gets more than 70% of its energy needs from conventional nuclear power. At the same time, the country has also recently emphasized its efforts to examine new technologies such as SMRs for their applicability. SMRs offer lower costs and significantly shorter installation times compared to conventional reactors and should also be more flexible to use.

Global Uranium Corp. - Uranium from Canada and the USA?

However, the possible rise of SMRs and the global renaissance of nuclear energy on the global stage bring with them another problem. Supply bottlenecks from Kazakhstan are likely to reduce the global supply of uranium in the coming years, while demand for the raw material is increasing. This is because uranium is indispensable for the production of nuclear energy. To make matters worse, the uranium extracted from Russia is subject to severe sanctions.

The solution to these uranium bottlenecks may therefore lie not in Asia, but in North America. There, the public company Global Uranium Corp. is pursuing ambitious exploration projects that are expected to provide new insights into possible uranium deposits in Canada and the United States.

Global Uranium Corp. is involved in the Northern Athabasca Joint Venture in Saskatchewan, Canada, in collaboration with the global players Cameco Corp., NexGen Energy LTD., Orano Canada Inc. and Forum Energy Metals Corp. This winter, Global and partners are preparing to construct a new camp, conduct geophysical surveys to delineate and refine new targets, and execute a drilling program to begin testing for the potential of unconformity-hosted uranium deposits.

At the same time, Global Uranium Corp. is developing five roll front-hosted uranium assets in Wyoming, USA, including the WAC, Jabs, Big Bend, Jeep South and Airline #2 projects. Here, too, the company plans to undertake extensive exploration in the coming years to gain new insights into possible uranium deposits. The company is determined to make an impact in the growing uranium market in the future.

Conclusion - From data centers to nuclear power

Data centers, AI applications, and cryptocurrencies are the new power guzzlers of our time - and will consume more and more electricity. Tech giants have long since realized that not only their climate targets but also their entire progress is at risk due to this power consumption.

In their search for an environmentally friendly AND reliable source of electricity, tech companies such as Google and OpenAI are turning to nuclear power. This was recently heading for a global renaissance, which could be significantly driven by new uranium from Canada and the USA.

This is because the public company Global Uranium Corp. is working intensively on the exploration of potential uranium deposits in the Athabasca Basin and in Wyoming. Investors should keep a close eye on the company in the meantime; expert reports and drilling are expected to provide initial findings on suspected uranium deposits as early as this year.

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