

TOPIC SERVICE

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Artificial intelligence - a real opportunity for climate action?

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We read new reports and articles about artificial intelligence (AI) almost every day. Sometimes it is touted as a panacea, sometimes it is presented as the greatest danger. And sometimes, the steady advance of digitalisation is actually prompting well-known companies to use nuclear power plants again to satisfy their hunger for data. Dennis Uieß, Head of Regulations & Frameworks at ClimatePartner, has summarised [his insights](#) on this topic.

In the following article, we would like to clarify how AI can be used sensibly, how to counter risks, and how to assess the emissions that arise when using AI.

The [German Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection](#) summarises the potential of AI technologies for the environment and climate as follows: "[...] For example, AI can be used to determine which tree species should be planted in order to adapt a forest area to climate change. AI can make the circular economy more environmentally friendly and resource-efficient: AI has the potential to optimise waste sorting and thus increase recycling rates for plastics, textiles or commercial waste, for example. Freight transport can also be managed more efficiently and therefore in a more climate-friendly way using AI-based processes. Last but not least, AI can contribute to nature conservation: data on the frequency and distribution of endangered animal and plant species can be better analysed and suitable protective measures can be developed in an even more targeted manner."

Conceptual categorisation

Artificial intelligence and machine learning (ML) now undoubtedly play a decisive role in the transformation of companies and their approaches to sustainability.

ML is an area of artificial intelligence that helps computers learn from data and recognise patterns without it having to be precisely programmed. Using special analytical and statistical methods, ML models can learn to make predictions and decisions using large amounts of data, even when confronted with new, unknown data. These technologies are used in numerous applications, from image and speech recognition to the analysis of climate data. They offer companies innovative ways to optimise their processes and improve their decision-making. AI and ML are often used interchangeably, including in this text, for the sake of simplicity.

Emissions accounting and plausibility check

ClimatePartner is already using AI in emissions accounting. For example, to assign suitable emission factors to materials or to calculate our own emission factors. Even for unknown product categories, validated assumptions can be made using AI, which increases the accuracy of the emissions calculations. This is particularly important for companies to be able to develop climate protection strategies, reduce their emissions and document them transparently.

All of these current and future application scenarios require a large database in order to train the corresponding models and ultimately apply them effectively. Thanks to its many years of experience in emissions accounting, ClimatePartner not only has extensive industry-specific expertise, but has also built up an enormous base of high-quality emissions data over the last twenty years. This data forms the basis, for example, for balancing Scope 3 emissions in particular, i.e. emissions from the supply chain for which a company may lack precise information. Traceability is crucial here - even when AI is used. This is the only way for companies to comply with the necessary auditing obligations as part of reporting. The results of an automated calculation of emissions for a material, a process or an entire product must be verifiable with corresponding sources, for example, the emission factor used.

In addition to supporting the calculation of carbon footprints, ClimatePartner also relies on AI for knowledge management. With the help of language models, the expertise of the past decades can be made available to all employees in a simple chat interface. This is particularly advantageous for training new employees, but also for processing complex or very specific customer enquiries. Over the years, an enormous wealth of knowledge has been built up with a large number of customers from different industries, which can now be efficiently analysed with the help of AI. ClimatePartner is actively utilising the many advantages of technological advancement and is constantly evolving as a result.

Emissions through the use of AI

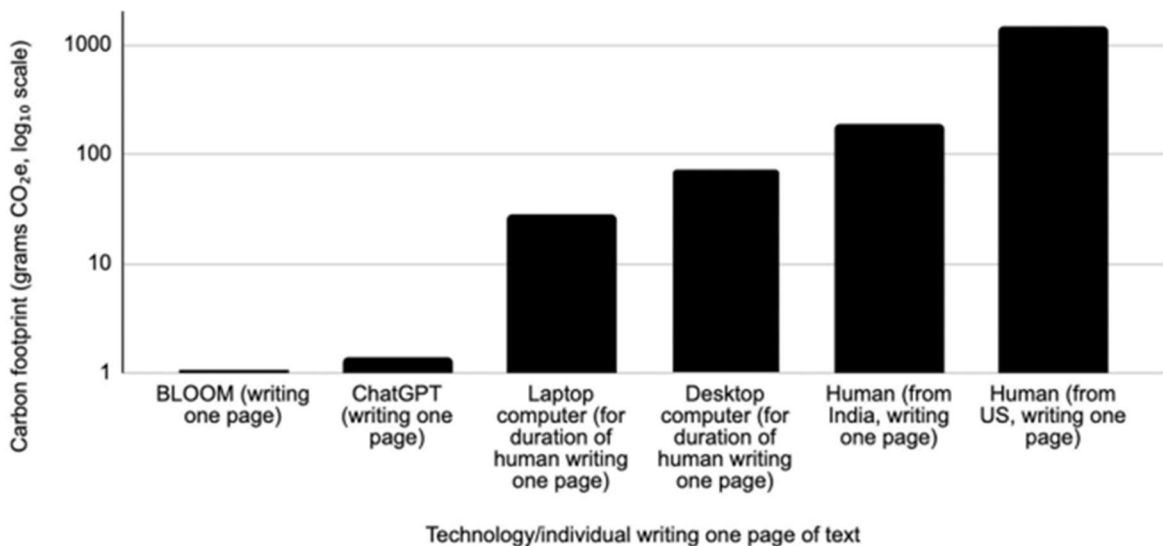
As a company that advises on climate action, one point is particularly important to ClimatePartner when it comes to the use of AI: the emissions generated by the use and training of these applications. These emissions come primarily from the energy consumption for these processes and can sometimes be high. It is important to take a differentiated view of the various AI use cases and refrain from making generalised statements.

Studies do show that the greenhouse gas emissions of certain activities can be significantly lower for AI applications compared to human activities. For example, analyses show that AI systems generate between 130 and 2,900 times less CO₂e per unit than humans when performing tasks such as writing and illustrating. This

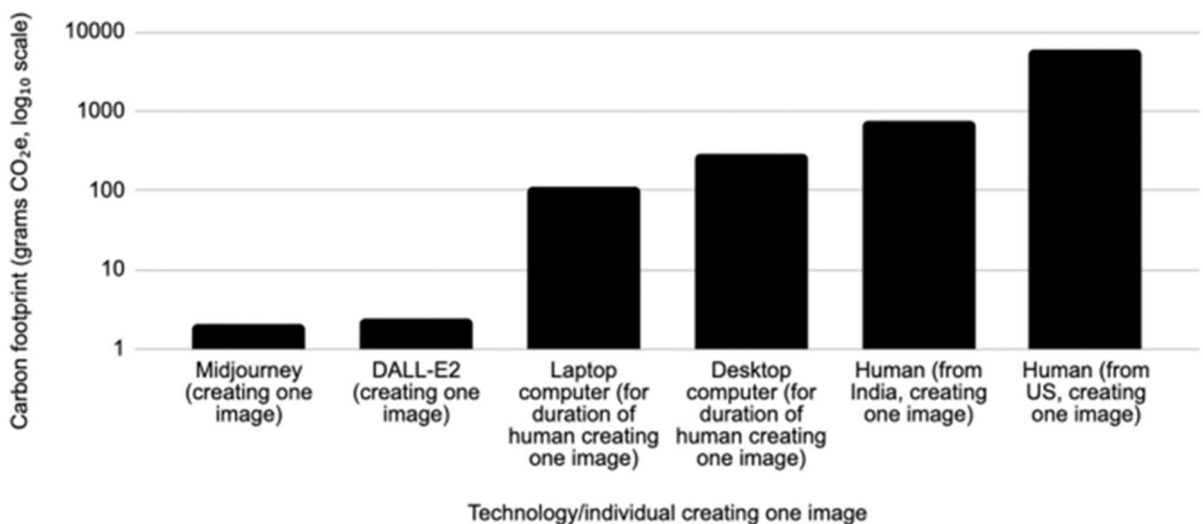
suggests that the use of AI in many areas can not only be more efficient, but also more environmentally friendly. But at the same time, for example, training GPT-3 (the model on which ChatGPT was based when it was published) [generated emissions comparable to](#) the lifecycle emissions of five cars.

Different models are computationally intensive in different ways. Depending on the use case of the model, the required amount of training data and cycles, the hardware used, and also the quality and efficiency of the algorithm used, AI models differ considerably in terms of energy consumption. It would therefore be too short-sighted to assess the emission intensity of AI in general. It depends on a large number of factors, and it simply does not make sense to make a sweeping statement.

Carbon footprint (grams CO₂e) for Text Writing



Carbon footprint (grams CO₂e) for Image Creation



ClimatePartner can assist in the assessment of AI-related emissions through reduction advice. This can be done by providing data and analysis that enables companies to assess and optimise the emissions of their AI usage. In doing so, ClimatePartner can draw on the collective experience of its industry experts and the emissions data collected over the years - for example on software applications.

The use of AI offers numerous advantages. At the same time, it is important to consider the emissions generated by its usage and develop strategies that minimise them. By combining AI and the development of sound climate protection strategies, ClimatePartner can help companies achieve their climate targets more effectively and reduce their environmental impact at the same time. ClimatePartner also has further plans for the use of AI in its own corporate processes - but in addition to technological progress, emissions will always be taken into account.

About ClimatePartner

ClimatePartner supports companies on their way to Net Zero. For around 20 years, the pioneer has been developing concepts for its customers that enable them to make a voluntary commitment and anchor climate action in their corporate strategy in the long term. With its flexible approach of software, consulting and reduction solutions, ClimatePartner helps its customers to make an active contribution to climate action both within and outside their own value chain - regardless of whether companies are just starting out or are already at an advanced stage of their individual Climate Action Journey. ClimatePartner's industry-specific solutions cover the entire process, from CO₂ accounting to the definition of reduction targets and the implementation of reduction measures. ClimatePartner also supports its customers in financing global and regional climate projects and in communicating their overall commitment to climate action in a detailed and transparent manner. This includes labelling that confirms the holistic and strategic approach of a company's voluntary climate protection measures. To this end, ClimatePartner's experts work every day on practical and sustainable approaches to contribute to the global Net Zero target by 2050.

ClimatePartner was founded in Munich in 2006. Around 500 employees from Barcelona, Berlin, Boston, Essen, Frankfurt, London, Milan, Munich (HQ), Paris, Stockholm, The Hague, Vienna and Zurich support more than 6,000 companies from 60+ countries.

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