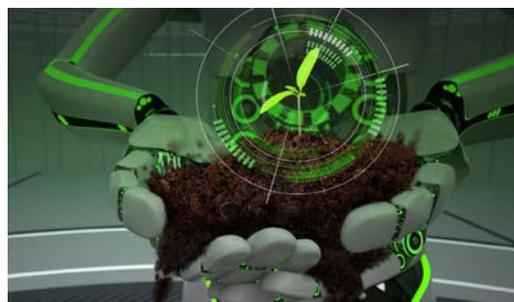


What if AI could help us become 'greener'?

As 'green transitions' become real political goals, what role can artificial intelligence (AI) play in helping to achieve them?

While some argue that AI can potentially be useful or even indispensable in 'green transitions', important questions remain open. Should AI only be used in resolving specific problems (for example, intelligent pollinating robots replacing a declining bee population), or should it be employed in 'governing' the sustainability of [complex socio-economic systems](#) such as mobility, or food or energy supply? While the latter option is currently technically unattainable and may be ethically dubious, it marks the axis of a political debate about possible synergies between sustainability and AI.



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Potential impacts and developments

In recent years, sustainability and AI have both been high on the EU's political agenda. The European Commission has advanced in the preparation of a [White Paper on AI](#) and the European Parliament has launched a [special committee on AI in the digital age](#) (AIDA). Several significant reports have recently been adopted or are currently being debated in Parliament's committees, including a [civil liability regime for AI](#), a [framework for ethical aspects of AI](#), and [intellectual property rights for AI technologies](#). With regard to sustainability, Parliament [adopted](#) a taxonomy of 'green' investments in June 2020. In 2019, the Commission included the implementation of the UN Sustainable Development Goals (SDGs) in the mandate of every Commissioner. The UN SDGs were also included in the European Semester process, as part of the European economic governance framework. In March 2019, the European Parliament adopted a [resolution](#) on the EU's implementation and delivery of the SDGs, calling on the Commission to work out a comprehensive SDG implementation strategy.

So far, these two issues – AI and sustainability – have not been linked in terms of concrete policies. However, in the context of the massive economic fallout brought about by the Covid-19 pandemic, building a 'sustainable and digital Europe', promised in Commission President Ursula von der Leyen's [political guidelines](#), remains a big challenge. Perhaps potential synergies between AI and sustainability could help the EU face this challenge?

It is instructive to put this question in the wider context of a policy debate that concerns both sustainability and AI. This debate oscillates between two images of sustainability and AI that can be described as 'weak' and 'strong'.

- '[Weak sustainability](#)' means that loss of natural capital is certainly regrettable and to be avoided, but it could be substituted by man-made capital, especially if helped by technological innovation. 'Strong sustainability' implies that human activity and its growth should not exceed the 'planetary boundaries', i.e. the capacity of the planet to sustain human life.
- Similarly, there can be 'weak' and 'strong AI'. The latter is usually understood as '[superintelligence](#)', for example AI systems that would eventually be able to act and make decisions without human intervention on an infinite range of complex issues.

In the long term, the role of AI in sustainability policies will depend on two factors. One factor concerns whether a stronger view on sustainability will underpin future policies. For example, even if the EU succeeds in going carbon neutral by 2050, it does not mean that all of the sustainability goals will be reached. In fact, the current UN SDGs (and by extension the EU's own sustainability goals) have been criticised as favouring weak sustainability. Another factor has to do with the technological development of AI itself. So far it does not seem as if superintelligence will emerge anytime soon, however the speed of AI development has been impressive. Whether and when such systems become technologically possible, the ultimate choice will lie in the realm of politics and ethics. It is highly unlikely that someone would advocate a 'strong-strong' solution – delegating the power over decision-making on sustainability issues to super-intelligent machines – but it is worthwhile to imagine possible ethical safeguards should this option ever become real.

In the near term, a more pragmatic step would be to get a better understanding of links between AI and the three main domains of sustainability: [social, economic and environmental](#). A recent [study](#) by McKinsey for the United Nations Development Programme (UNDP) shows that current applications of AI can be found to a greater extent in the domain of social sustainability (such as in health and education). As to economic sustainability, the potential of AI to drive the circular economy appears to be substantial. AI can help, [for example](#), in the development of new products, components and materials. It can also optimise logistics and inventory, and provide 'smart management' tools. Most importantly, AI could help [tackle](#) the negative effects of automation on employment by creating new jobs.

Finally, environmental sustainability is an area where AI has proven to be extremely helpful, with a very wide range of applications. One of the most recent discoveries made thanks to AI was the new [understanding](#) of how long it would take for global temperatures to react to a decline in man-made CO₂ emissions. This temperature lag has proven to be much faster than previously thought. However, perhaps the main contribution of AI to sustainability overall is that it might provide tools for better understanding the interconnectedness of the environment, society and economy. The more AI proliferates in different sectors, the more its effects can be traced and understood with the help of machine learning. In turn, this expands our understanding of what 'weak' or 'strong' sustainability may entail in practice.

Anticipatory policy-making

The world is only beginning to understand and anticipate how AI can be used in the three domains of sustainability and what its effects might be. While China and the United States of America have been doing a lot of advanced [research and development](#) on AI in general, it is the EU that may be better placed to test the applicability of AI in the domains of sustainability. The Commission initiatives on 'green and digital' Europe could provide the ground for such anticipatory work. Several elements would benefit anticipatory policy-making on AI and sustainability:

Develop a common data management framework of AI uses throughout the EU sustainability agenda. As argued elsewhere, without a common EU sustainability [data management](#) framework (including collecting, sharing and analysis), the application of AI technologies will remain patchy. Data accessibility across the EU and interoperability of AI systems is an important issue.

Think systemically. The proliferation of AI in the economy, society and environment does not automatically lead to an overall improvement in sustainability. A systemic anticipatory approach would entail thinking of applying AI in complex socio-economic systems. For example, the food system would use economic, environmental and social indicators, including not just the reduction of CO₂ emissions but also people's well-being resulting from changes in their food consumption. AI could help to understand how one indicator is connected to another.

Human behaviour is key. Both using AI and caring about sustainability entails changes to human behaviour across generations. Anticipatory policies could include measures to limit the gap between generations and enhance trust in adjusting behavioural patterns.