

Summary Report from the ODI Roundtable on AI and Green and Just Transitions

Rapid developments and investments in Artificial Intelligence (AI) are reshaping global flows and demands for natural resources, energy, water, and land. Beyond AI's various applications in resource-extractive industries, the production of AI systems themselves is driving up demand for natural resources – particularly for data centers, the “factories” of contemporary AI production.

By some estimates, global data centre energy consumption accounted for about 1.5% of total electricity use in 2024, a figure [projected](#) to double to 3% by 2030. The growth of AI markets is also fueling a “[critical minerals supercycle](#)” - marked by rising demand for resources such as copper, tin, cobalt, lithium, and gallium, which are among the minerals essential to the AI supply chain.

The material underpinnings of contemporary AI economy's supply chains are critical to consider for global AI governance, as well as to advance the global energy transitions, and particularly just transitions, agendas. [Geopolitical tensions](#) are fueling demands for the development and expansion of ‘sovereign’ data centres and intensifying efforts to secure and securitise global mineral resource supply chains. The energy, land and water demands of data centres are reshaping global supply chains, displacing communities, and potentially undermining efforts towards sustainability, environmental justice and labour rights. The risks are particularly exacerbated for countries in the [Global South](#) – which are the site of not only much of the resources and labour in the AI supply chain but are also considered frontier markets for the expansion of AI-based products and services.

Despite overlapping concerns, policy agendas and advocacy efforts around AI governance and green and just energy transitions remain fragmented and siloed. Rapidly evolving AI policy frameworks at national and international levels rarely account for the environmental or downstream implications of AI, which risk undermining efforts toward environmental justice, climate action, and just transitions. There is a need, and an opportunity, to develop and pursue a common agenda for just and equitable AI governance.

On November 4, ODI Global convened a roundtable on **AI and Just Transitions**, bringing together participants from academia, civil society and government to deliberate on the

implications of the emerging AI economy for green and just transitions. This report summarises the broad themes emerging from the discussion.¹

"We should be concerned about the gentrification of energy systems"

Participants deliberated on how to measure the impacts of AI on green transitions, and whether the appropriate benchmarks and standards exist to assess these impacts. Participants surfaced that there was a tension between competing narratives of AI's use in accelerating green transitions through its use in decarbonisation initiatives, and on the material impacts of energy and resource use in the development and use of AI systems themselves.

Participants noted that the energy and resource use consequences of AI are unique in many ways. For one, the current climate of AI development is characterised by its efforts to scale, privileging short-term growth at the expense of long-term sustainability. One participant noted how the push to scale data centres has led to AI companies installing small-scale gas-powered units while they wait to be connected to the grid on renewable energy sources. Another participant voiced the concern that the current trajectory of data centre growth could have structural effects in energy markets, and is leading to the 'gentrification of energy' - the increasing investment in, and appetite for, renewable energy use by data centres is diverting clean energy to data centres, while other uses continue to rely on carbon-intensive sources. Similarly, AI is also having structural effects on mineral production, reflected both in demands for 'critical' minerals for data centres, as well as the use of AI to produce 'efficiency gains' in mineral extraction.

Some participants noted the limitations of existing frameworks for modelling, measuring and quantifying the climate and energy impacts of AI, and argued that the impacts of AI should be examined beyond the context of data centres. One effort to model AI's climate implications, for example, has noted more than 30 pathways where AI intersects with climate change, including through producing efficiencies in industrial production in other sectors. Participants also emphasised the need to model AI's energy and resource requirements across its production and use cycles – for example, the different requirements for computational resources at the training and inference stage. Moreover, energy requirements differ across model development paradigms – some models may have low

¹ This roundtable was held under the Chatham House rule, and this summary report is not intended to be a verbatim account or represent a consensus among participants.

training costs and high inference costs. These models suggest that the impact of AI is bigger, more uncertain and more difficult to regulate since the impact is diffused across sectors, uses and production mechanisms.

“What they need is also what is killing them”

Another issue of concern in the discussion was the distributive impact of AI – who is benefiting from the current AI economy, and how can we ensure equity in its development and use? Multiple participants surfaced how control over AI production and influence in innovation, development and governance is heavily steered by a small number of powerful firms and governments which are pursuing scale and profits at the cost of climate-sensitive governance. This is reflected in who sets the policy agendas and drives the narratives on AI governance, including at national and international forums.

Participants noted how countries like Small Islands Developing States (SIDS), are facing a dilemma – to risk being left behind in the digital transformation of government and workforces (which is needed to compensate for human resource constraints), or be compelled to make unviable financial and resource investments into securing, developing and maintaining AI systems which may be unsuitable for their contexts and fuel greater inequalities within these countries, particularly in diverting land, water and energy uses towards data centre and AI development. Participants also noted how AI may fuel practices like Deep Sea Mining which has a much greater impact on these communities. Without a place in the table for global AI governance, many communities and governments risk being left out of the trajectories for their own sustainable economic and social development.

Participants noted that current projects and investments in AI, including by governments and development actors are pursuing trends and visions of ‘Artificial General Intelligence’, and noted that focus should be on studying the practical ways and use-cases in which AI can support local ecosystems in tackling climate risks, rather than being carried away by narratives in pursuit of business models. For example, investments could focus on small, locally appropriate projects that are not reliant on large-scale data centres. However, participants were wary of the capital-intensive nature and market concentration of innovation in current AI production, and the feasibility of AI model development in low-resource contexts.

“AI sovereignty has symbolic value, but replicates extractivist models”

Participants were unsure whether and to what extent models for ‘sovereign’ AI would be effective in challenging the narratives or distributive concerns around the AI economy and its climate impacts. While some participants noted that regional efforts like the LATAM GPT to develop regionally-specific models were underway, others noted their skepticism about the ability of these models to compete with models developed by leading firms. Participants noted that the pursuit of ‘sovereign’ AI systems could be a realistic path towards fairer global exchange of the risks and benefits in the AI economy, but also noted the risk of current ‘sovereignty’ discussions simply becoming another marketing term which allowed firms to access to different markets, further fueling data centre expansion and associated risks.

Participants stressed the need for greater international cooperation to address some of these concerns. One participant raised the possibility of negotiating a ‘benefits sharing model’ like that developed for biocultural resources under the Nagoya Protocol, to ensure that communities producing valuable resources in the AI economy – including minerals, energy, labour or data – would benefit from its use in commercial or scientific applications of AI.