

CLIMATE CHANGE AND AI

Recommendations for
Government Action

Global Partnership on AI Report

In collaboration with Climate Change AI and
the Centre for AI & Climate



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Executive Summary

Climate change is one of the most pressing issues of our time, requiring rapid action spanning many communities, approaches, and tools.² Artificial intelligence (AI) has been proposed as one such tool, with significant opportunities to accelerate climate action via applications such as forecasting solar power production, optimizing building heating and cooling systems, pinpointing deforestation from satellite imagery, and analyzing corporate financial disclosures for climate-relevant information.³ At the same time, AI is a general-purpose technology with many applications across society, which means it has also been applied in ways that impede climate action both through immediate effects and broader systemic effects.⁴

In this report, we provide **actionable recommendations as to how governments can support the responsible use of AI in the context of climate change**. These recommendations were obtained via consultation with a broad set of stakeholders, and span three primary categories: (a) supporting the responsible use of AI for climate change mitigation and adaptation, (b) reducing the negative impacts of AI where it may be used in ways that are incompatible with climate goals, and (c) building relevant implementation, evaluation, and governance capabilities for and among a wide range of entities.

Our full list of recommendations is provided in Table E-1. To illustrate these recommendations, we additionally provide **a booklet of high-potential AI-for-climate use cases** illustrating the capabilities of AI for climate action across different sectors, and describing policy-relevant bottlenecks such use cases may face in terms of development, deployment, and scaling.



Supporting AI applications in climate change mitigation and adaptation

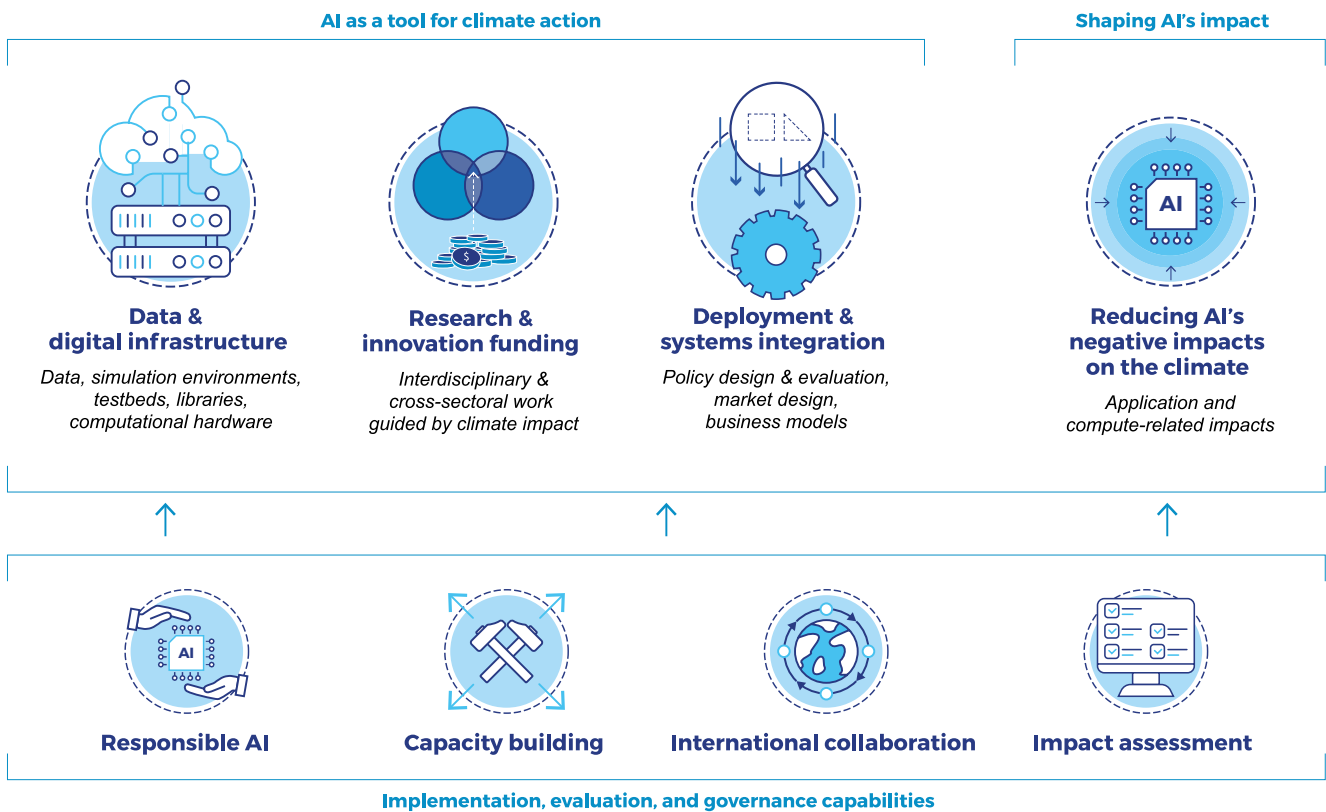
Given the short time scales on which society must address climate change, it will be critical that responsible climate solutions be rapidly deployed and scaled across key sectors. However, many such solutions often get stuck in research or early stages of technological readiness, and even after initial deployment, often face difficulties scaling. We propose that governments can take leadership in supporting the use of AI to address climate change by:

- Fostering the responsible development of and access to **data and digital infrastructure** — e.g., relevant data, simulation environments, testbeds, model libraries, and computational hardware — that can support the development and adoption of AI-for-climate applications.
- Targeting **research and innovation funding** to enable interdisciplinary

² *Special Report: Global Warming of 1.5 °C*, Intergovernmental Panel on Climate Change (2018).

³ *Tackling Climate Change with Machine Learning*, Rolnick et al. (2019).

⁴ *AI and Climate Change: How they're connected, and what we can do about it*, Dobbe and Whittaker (2019).



Areas of action for governments in supporting the responsible use of AI in the context of climate change

and cross-sectoral work at the intersection of AI and climate change that is guided by climate impact.

- Supporting **deployment and systems integration** of AI-for-climate applications via targeted policy design and evaluation, market design, and business models, including within highly-regulated sectors such as energy, transportation, agriculture, and heavy industry.



Reducing AI's negative impacts on the climate

Every application of AI affects the climate, which means aligning AI with

climate change strategies involves not only facilitating beneficial applications of AI, but also shaping the space of AI overall so that business-as-usual applications are more climate-aligned. Notably, there are three principal ways in which AI can increase greenhouse gas emissions: (a) via its use for applications with immediate negative impacts on emissions, (b) via system-level impacts such as induced demand or lock-in effects associated with AI applications, and (c) via the carbon footprint associated with the life-cycle impacts of the associated software and hardware.⁵ Governments can work to reduce the negative impacts of AI by **incorporating climate impact considerations into AI regulation,**

⁵ *Aligning artificial intelligence with climate change mitigation*, Kaack et al. (2021, working paper).