Powering up Science and Action: Roundtable on Artificial Intelligence and Climate Change

Ann Bostrom, Roundtable Chair

August 15, 2025

AI, Energy Demand, and the Environment: Perspectives on Information Sharing

Societal Experts Action Network and the **Board on Environmental Change and Society**

National Academies of Sciences, Engineering, and Medicine

Artificial Intelligence and Climate Roundtable

This Roundtable will foster ongoing discussions, shared learning, and coordination around emerging issues related to AI and climate change. This Roundtable will explore both how AI can combat climate change and the environmental impact of AI itself, encompassing technical, social, and behavioral dimensions.

This activity was supported by **Google**, the **Heising-Simon Foundation**, **IBM**, **Microsoft**, the **Patrick J. McGovern Foundation**, the **William and Floral Hewlett Foundation**, and a grant from the **Chan Zuckerberg Initiative DAF**, and advised fund of **Silicon Valley Community Foundation**.

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Roundtable Statement of Task

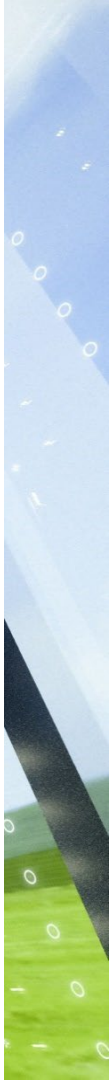
The National Academies' Roundtable on Artificial Intelligence and Climate Change will foster ongoing discussions, shared learning, and nimble coordination around emerging issues related to AI and climate change. This Roundtable will explore both how AI can combat climate change and the environmental impact of AI itself, encompassing technical, social, and behavioral dimensions. The Roundtable will focus on AI applications in climate-related areas, such as:

(1) Optimizing energy systems and other climate-influencing infrastructures;

(2) Aiding effective, just, and equitable climate-related research and decision-making; and

(3) Developing assessments, policies, regulations, and markets related to climate change.

It will also examine the energy consumption and climate effects of AI technologies and strategies for mitigating those impacts.



Roundtable Members

Ann Bostrom, University of Washington (Chair)

Yury Dvorkin, Johns Hopkins University

Carla Gomes, Cornell University

Anna Biagi Harper, University of Georgia

Prakhar Mehrotra, PayPal

Jonathan Overpeck, University of Michigan

Line Roald, University of Wisconsin – Madison

Stephan Sain, Jupiter Intelligence

Constantine Samaras, Carnegie Mellon University

Gavin Schmidt, NASA

Prashant Shenoy, University of Massachusetts Amherst

Abigail Snyder, Pacific Northwest National Laboratory

Ex Officio Members

Nick Cain, Patrick J. McGovern Foundation

Ali Douraghy, Google

Tamar Eilam, IBM

Amy L. Luers, Microsoft

Jonathan Pershing, William and Flora Hewlett Foundation

Alicia Seiger, Chan Zuckerberg Initiative

Devra Wang, Heising-Simons Foundation

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Workshop Highlights: **Implications of Artificial Intelligence-Related Data Center Electricity Use and Emissions**

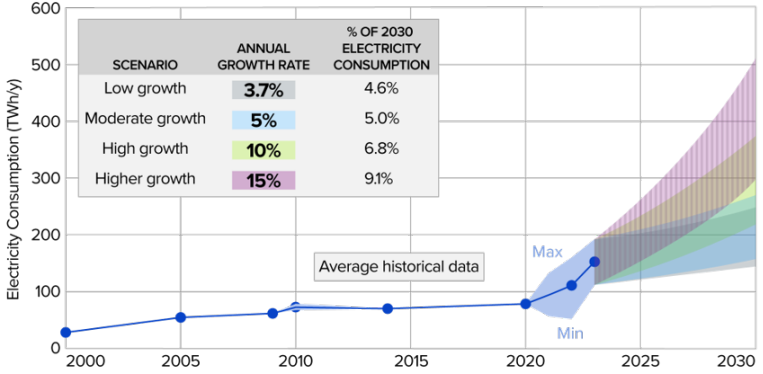

Figure 2.2. Projected growth in U.S. data center demands through 2030 under four scenarios, Source: Tom Wilson EPRI.
National Academies of Sciences, Engineering, and Medicine, 2025. *Implications of Artificial Intelligence–Related Data Center Electricity Use and Emissions: Proceedings of a Workshop*. Washington, DC: The National Academies Press. https://doi.org/10.17226/29101.

The Roundtable hosted its first workshop **November 12-13, 2024**. Attendees discussed key themes such as:

- Opportunities to mitigate increased electricity use and emissions through technical and policy solutions
- Regional implications related to data center siting and renewable resource availability
- Opportunities for AI technologies to improve the grid and accelerate decarbonization goals by facilitating efficiency improvements
- Enhanced collaboration and data sharing around AI data center activities

"Even if we don't know everything, we can still take actions that are consistent with the outcomes that we want."

- Costa Samaras (Carnegie Mellon University) during workshop panel discussion

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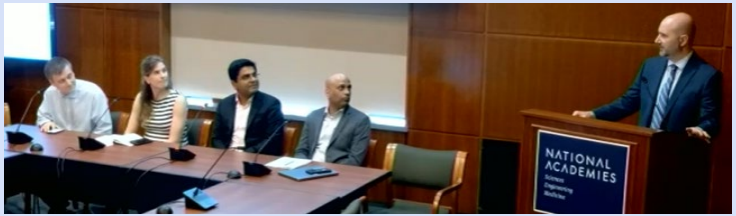
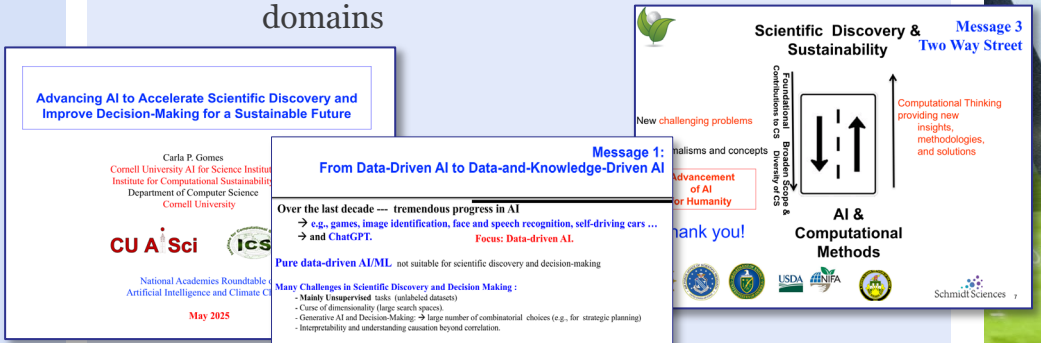
Executive Meeting Highlights: **May Open Session**

On May 5, 2025, the Roundtable held an open session to discuss how new advances in artificial intelligence can help solve climate challenges. The meeting included:

- A panel discussion, moderated by Costa Samaras, that highlighted key themes from the 2024 workshop and discussed topics the Roundtable could pursue to build on the workshop including:
  - embracing and understanding uncertainty during decision-making
  - collaboration between key actors in this space
  - communicating research findings with stakeholders and the public



- A presentation by Carla Gomes on advancing AI to accelerate scientific discovery, which elevated key topics for the Roundtable to pursue that go beyond the 2024 workshop:
  - combining data-driven AI with knowledge reasoning for climate risk mitigation
  - ethical AI systems for decision-making to balance environmental and societal goals
  - transferability of AI methodologies across domains



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Roundtable Pillars – Towards a Strategic Vision

Ultimate North Star: Unlock AI's transformative potential across climate science, mitigation, adaptation, and decision-making, in parallel with addressing ethical, educational, and infrastructural challenges of AI applications

In service of this North Star, the core pillars of the Roundtable are:

- **Pillar 1: Accelerating Climate Science and Innovation**. Applying AI to advance scientific discovery, predictive capabilities, and climate solutions.
- **Pillar 2: Optimizing Energy Systems and Infrastructure**. Applying AI to drive operational efficiency, systems integration, and resilient infrastructure.
- **Pillar 3: Empowering Decision-Making and Accountability**. Applying AI to enhance transparency, accountability, and informed climate action.
- **Pillar 4: Building Capacity and Resilience in Human Systems**. Equipping the workforce and the public with AI literacy while mitigating the social impacts of AI adoption.

Accelerating Climate Progress with AI: From Science to Action

This workshop will **explore innovative ways artificial intelligence (AI) can enhance and accelerate the transformation of climate science into actionable information for decision making for resilience and mitigation**. The workshop will serve as a forum for interdisciplinary, cross sectoral dialogues about:

The **use of AI in climate modeling and emerging AI tools** that can advance adaptation, mitigation, and resilience efforts

Areas **where AI could facilitate near-term advancements in climate science** and/or the transformation of that science into actionable information for addressing climate threats and impacts

Stakeholders' key needs for climate information at various spatial (e.g., local to national) and temporal scales

Expanded **opportunities for interdisciplinary and cross-sector partnerships to co-develop responsible climate-AI tools**, including consideration of how to incorporate findable, accessible, interoperable, and reusable (FAIR) principles and data access and management

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Emerging Collaboration: **National Academies Electricity Forum**

The National Academies Electricity Forum is tasked with providing a trusted and balanced venue for information-sharing; gaining common understanding; and grappling with complex technical, economic, environmental, regulatory, policy, and societal changes prompted by grid modernization efforts.

Members of the AI & Climate Roundtable and the Electricity Forum are working together to scope out two convening activities:

- A **webinar series** to provide general information about the nexus of electricity and artificial intelligence, building off the Roundtable's first workshop on the implications of AI-related data center electricity use and emissions.
- A workshop on **Ensuring AI Interoperability in the Electricity System**, which will:
  - Provide an overview of current efforts to integrate novel AI tools into elements of electricity system operation, and the current state of interoperability; and
  - Identify current challenges and potential solutions for interoperability of AI in the electricity system, including interpretability for the operation of AI tools and systems

Information-sharing at the Nexus of AI and Climate Change

In the context of **AI and climate change**, risk communication plays a vital role in how stakeholders understand both the potential benefits and downsides of AI applications

Risk Communication and Decision Support

- Accuracy and reliability of AI models
- Data biases and gaps
- Over-reliance on AI
- Ethical and equity risks
- Incentivizing responsible use

Disclosure
(e.g., as related to emissions accounting)

- Accuracy and verification of AI-generated emissions data
- Transparency and explainability of accounting methodology
- AI carbon footprint / environmental disclosures
- Use of AI in emissions tracking
- Continuous monitoring vs annual reporting