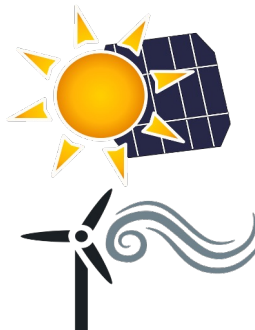
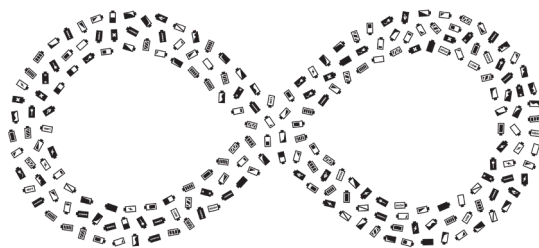
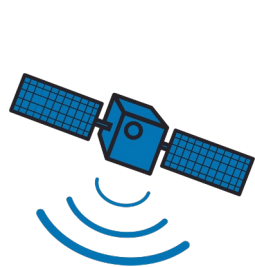




Climate Change AI

AI technology is key to enable strategies **to accelerate climate action** when applied responsibly in partnership with relevant stakeholders.



Gaps in **expertise, education, coordination, & infrastructure** hinder the rapid transition from innovation into real-world solutions

CCAI is addressing those gaps through **democratization** and **coordination**.



Climate Change AI

Global non-profit empowering a global community to accelerate impactful research and deployment.

Expertise & thought
leadership



Education &
capacity building



Community &
collaboration

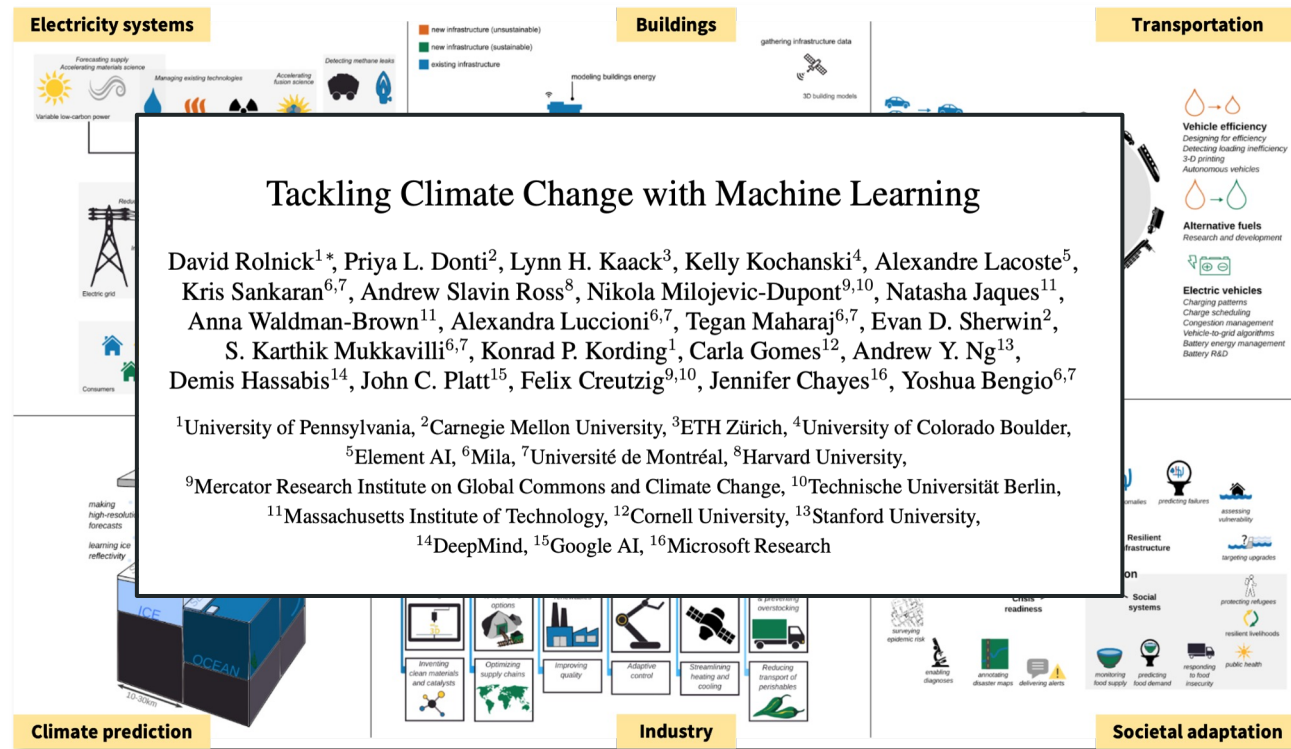


Research-to-
deployment infra.





AI technology is key to enable strategies to **accelerate climate action** when applied responsibly in partnership with relevant stakeholders.



Climate Change AI Report
Tackling Climate Change
with Machine Learning
(2019)



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High Leverage denotes bottlenecks that domain experts have identified in climate change mitigation or adaptation and that we believe to be particularly well-suited to tools from ML. These areas may be especially fruitful for ML practitioners wishing to have an outsized impact, though applications not marked with this flag are also valuable and should be pursued.

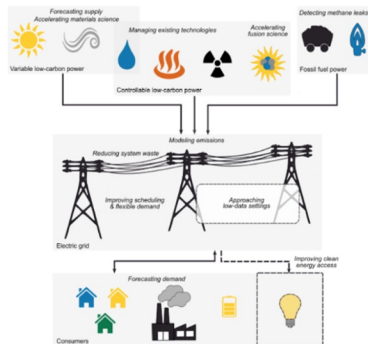
Long-term denotes applications that will have their primary impact after 2040. While extremely important, these may in some cases be less pressing than those which can help act on climate change in the near term.

Uncertain Impact denotes applications where the impact on GHG emissions is uncertain (for example, the *Jevons paradox* may apply³) or where there is potential for undesirable side effects (*negative externalities*).



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Electricity systems

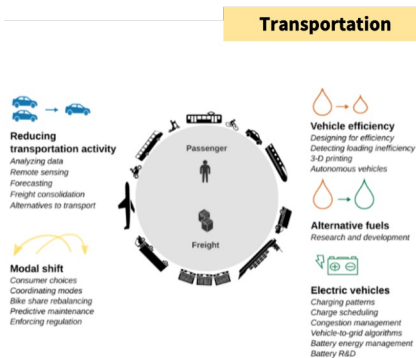


- + Forecasting supply and demand High Leverage
- + Improving scheduling and flexible demand High Leverage
- + Accelerating materials science High Leverage Long-Term
- + Additional applications (for variable sources)
- + Managing existing technologies
- + Accelerating fusion science High Leverage Long-Term
- + Reducing life-cycle fossil fuel emissions High Leverage Uncertain Impact
- + Reducing system waste
- + Modeling emissions
- + Improving clean energy access
- + Approaching low-data settings High Leverage

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+ Understanding transportation data

+ Modeling demand

High Leverage

+ Shared mobility

Uncertain Impact

+ Freight routing and consolidation

High Leverage

+ Alternatives to transport

Uncertain Impact

+ Designing for efficiency

+ Autonomous vehicles

Uncertain Impact

+ Electric vehicles

High Leverage

+ Alternative fuels

Long-Term

+ Passenger preferences

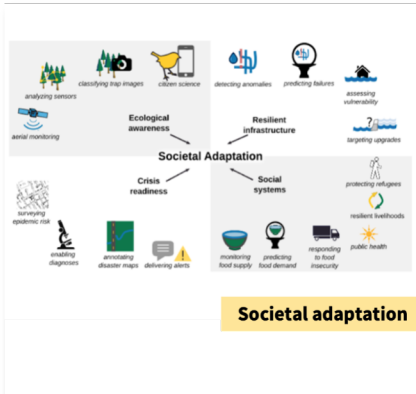
+ Enabling low-carbon options

High Leverage

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+ Monitoring ecosystems

High Leverage

+ Monitoring biodiversity

High Leverage

+ Designing infrastructure

Long-Term

+ Maintaining infrastructure

High Leverage

+ Food security

High Leverage

+ Resilient livelihoods

+ Supporting displaced people

Long-Term

Uncertain Impact

+ Assessing health risks

+ Managing epidemics

+ Disaster response

High Leverage

Climate Change AI Report
Tackling Climate Change
with Machine Learning
(2019)

Opportunities in AI-for-climate applications



Gathering information

Emissions, deforestation, infrastructure, crops, policy



Image source: ClimateTrace

Opportunities in AI-for-climate applications



Gathering information

Emissions, deforestation, infrastructure, crops, policy

Forecasting

Renewable energy, transportation demand, extreme events

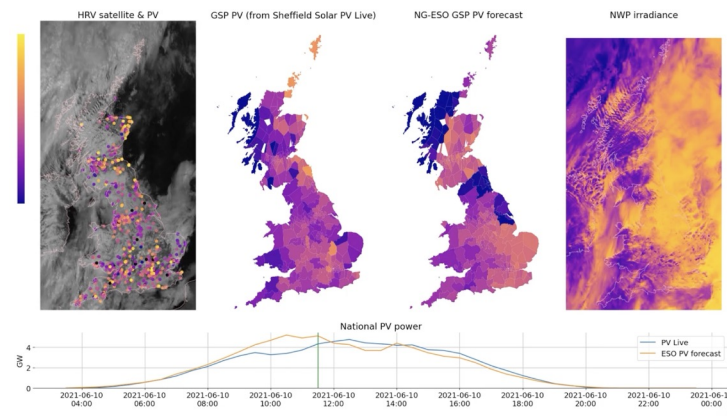


Image source: Open Climate Fix

Opportunities in AI-for-climate applications



Gathering information

Emissions, deforestation, infrastructure, crops, policy

Forecasting

Renewable energy, transportation demand, extreme events

Improving operational efficiency

Heating and cooling, freight, food waste

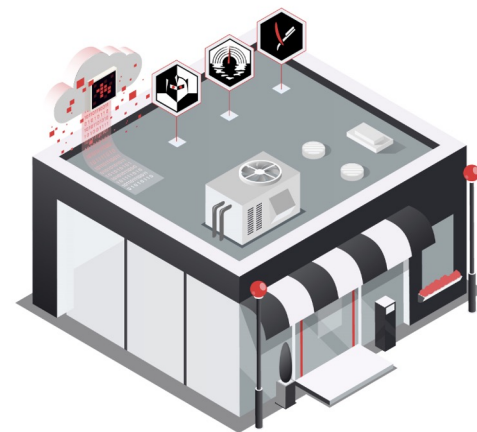


Image source: BrainBox AI



Opportunities in AI-for-climate applications

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Forecasting

Renewable energy, transportation demand, extreme events

Improving operational efficiency

Heating and cooling, freight, food waste

Predictive maintenance

Methane leaks, resilient infrastructure

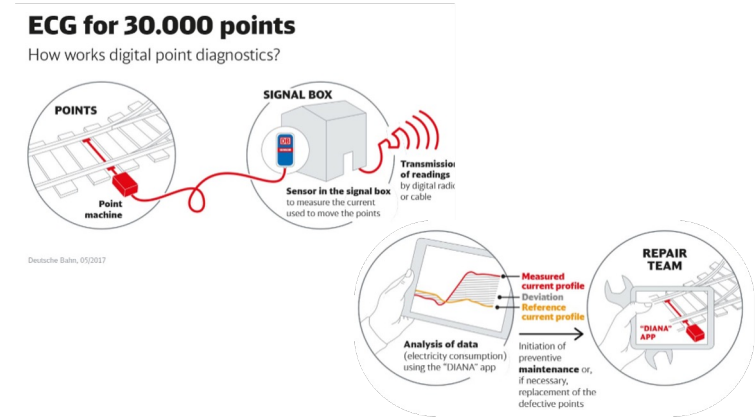


Image source: Deutsche Bahn



Opportunities in AI-for-climate applications

Gathering information

Emissions, deforestation, infrastructure, crops, policy

Forecasting

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Improving operational efficiency

Heating and cooling, freight, food waste

Predictive maintenance

Methane leaks, resilient infrastructure

Accelerating scientific experimentation

Batteries, electrofuels

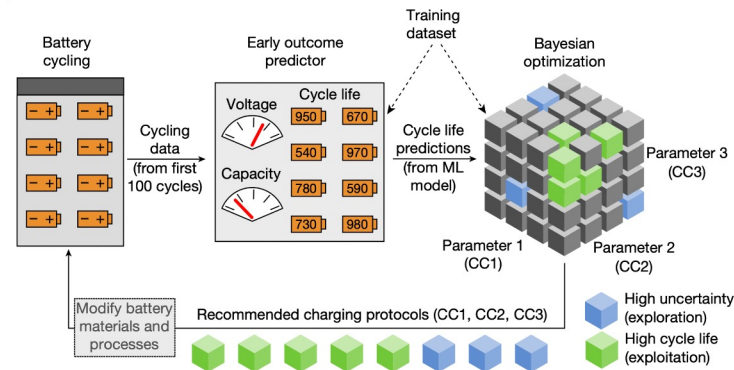


Image source: Attia et al., 2020



Opportunities in AI-for-climate applications

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Emissions, deforestation, infrastructure, crops, policy

Forecasting

Renewable energy, transportation demand, extreme events

Improving operational efficiency

Heating and cooling, freight, food waste

Predictive maintenance

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Batteries, electrofuels

Approximating time-intensive simulations

Climate, energy, city planning

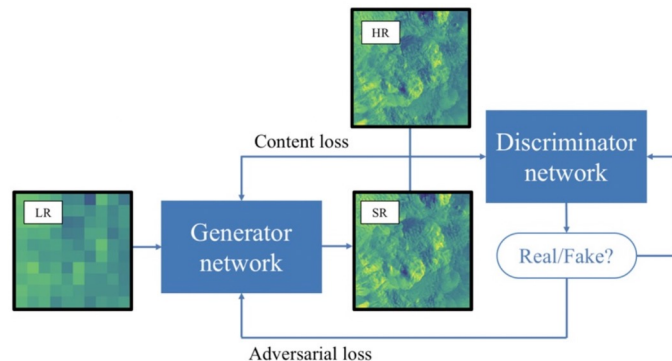


Image source: Stengel et al., 2020



Opportunities in AI-for-climate applications

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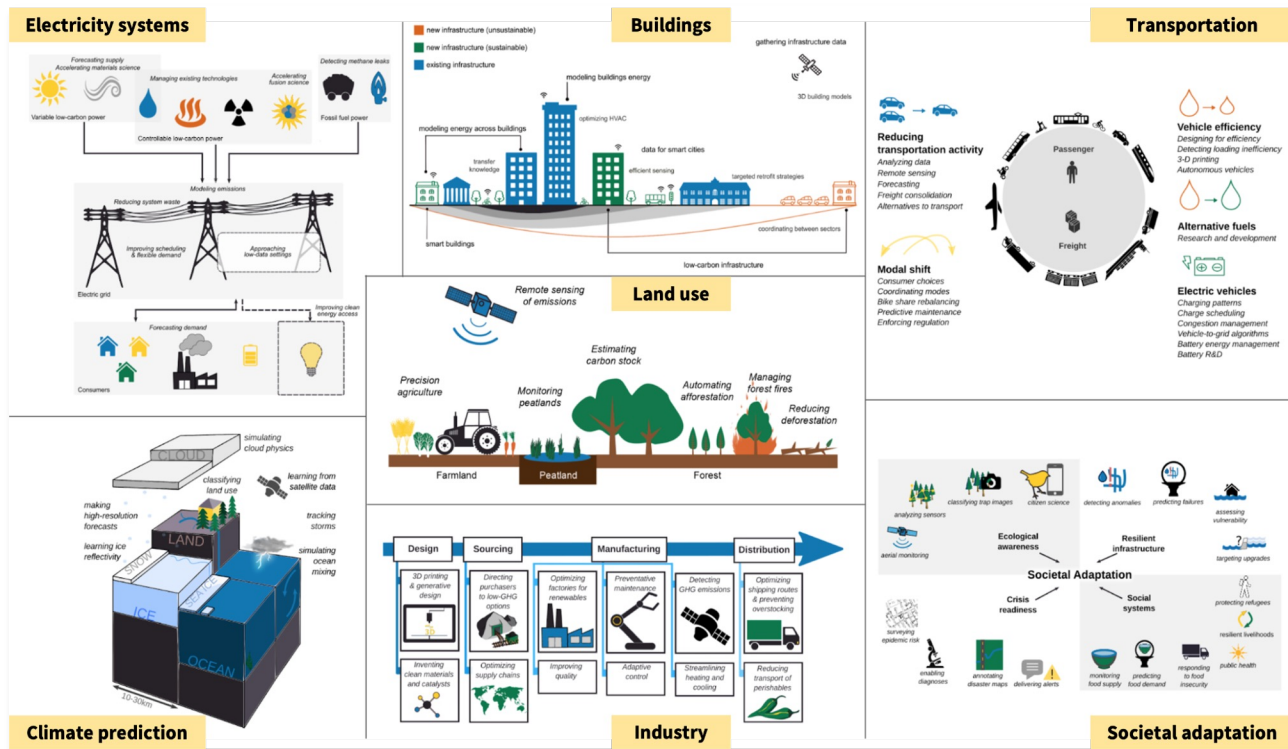
Approximating time-intensive simulations

Climate, energy, city planning



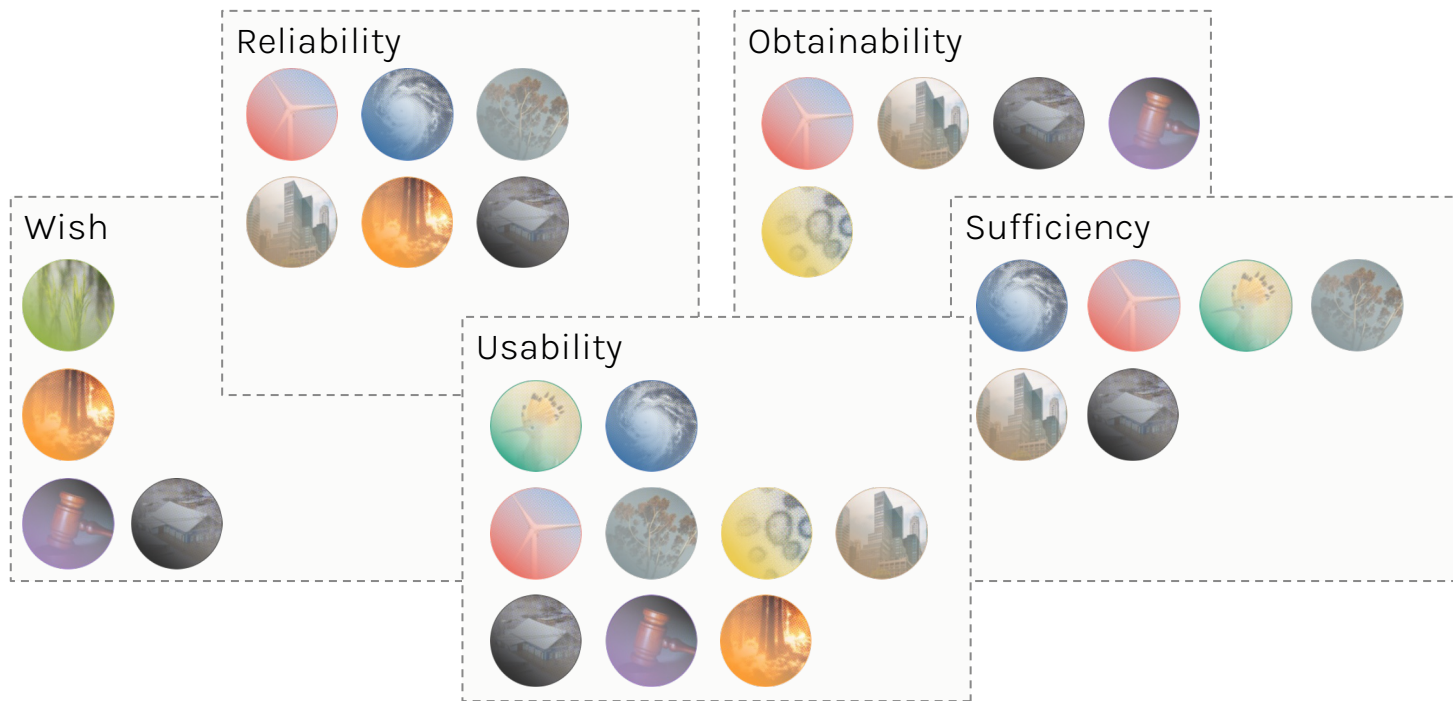
AI technology is key to enable strategies to **accelerate climate action** when applied responsibly in partnership with relevant stakeholders.

Climate Change AI Report Tackling Climate Change with Machine Learning (2019)





We assess **AI-for-climate data gaps** across multiple climate-related **sectors**, categorized by **data gap type**





We assess **AI-for-climate data gaps** across multiple climate-related **sectors**, categorized by **data gap type**

Wish

Dataset does not exist

Reliability

Data quality or integrity needs improvement

Obtainability

Data is not easily obtainable
(e.g., is not findable or accessible)

Sufficiency

Data is insufficient, requiring additional data collection and/or simulation

Usability

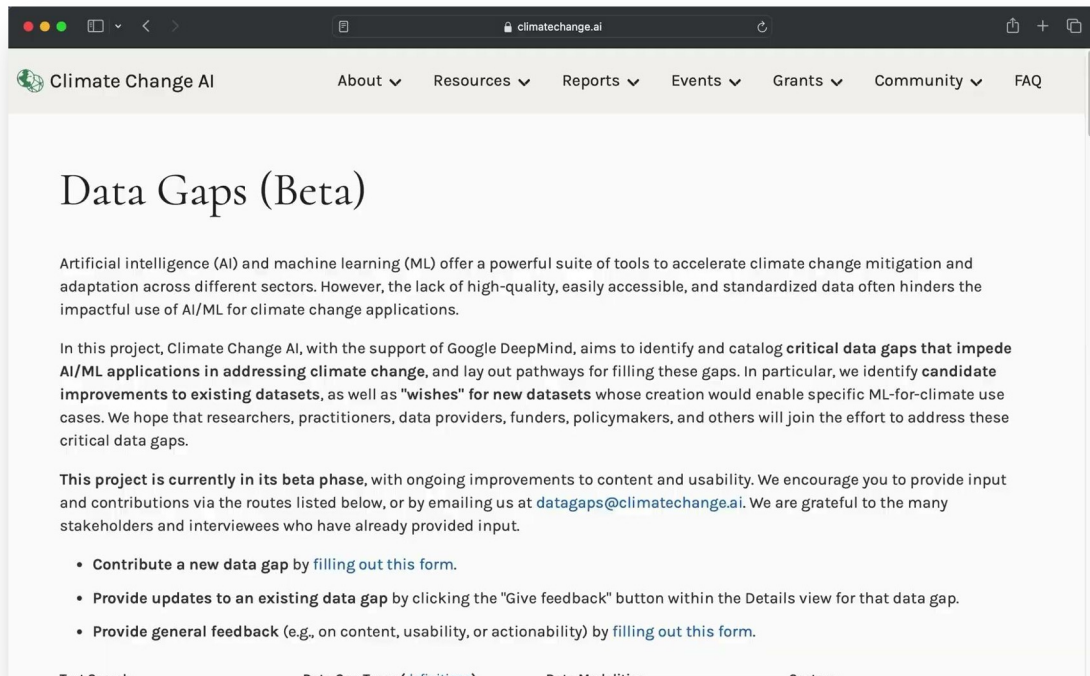
Data is not readily usable
(by people and/or machines)

Miscellaneous

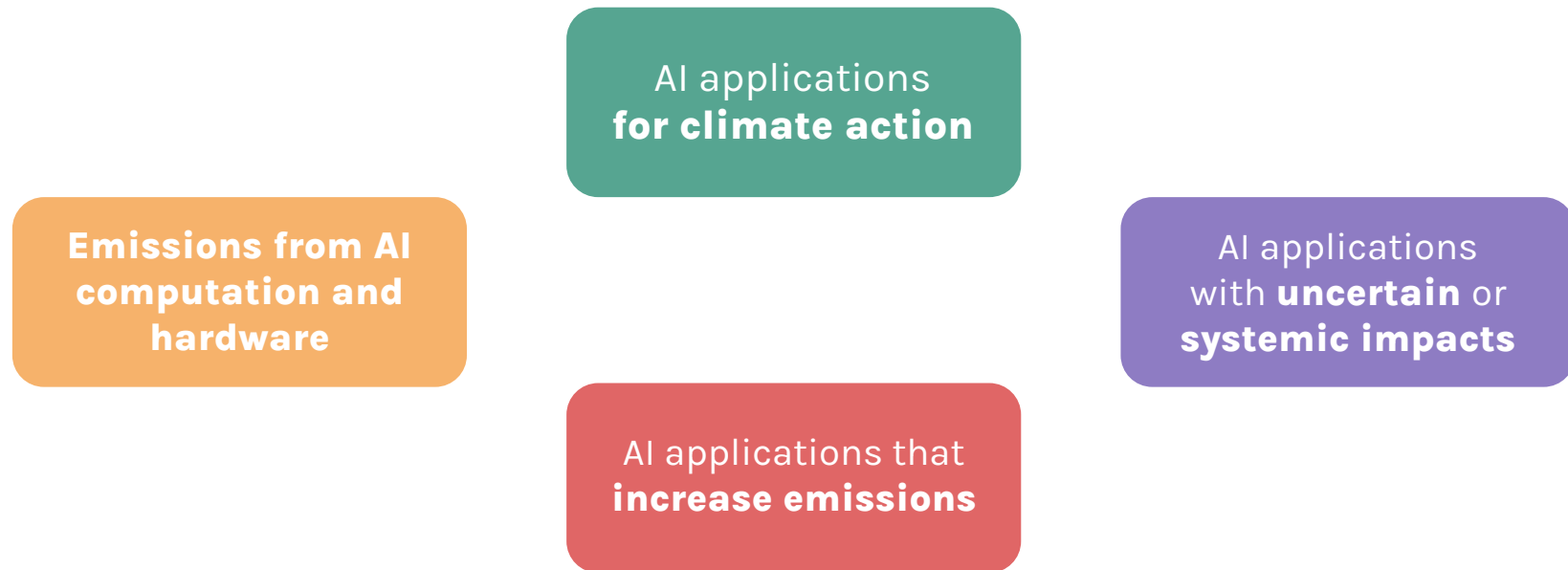
Additional challenges, including challenges that arise from the use of multiple datasets



We assess **AI-for-climate data gaps** across multiple climate-related sectors, categorized by **data gap type**



***Multifaceted relationship** between AI and climate*



Developing AI with **responsible, impact-driven** and **equity-centered** approaches



Avoiding techno-solutionism

- AI is not a silver bullet
- Where it's applicable, only one part of the strategy

Mitigating biases in data and models

- E.g., Buildings data: Housing discrimination, uneven availability across geographies
- E.g., Weather models: Calibration may be optimized for particular regions

Improving trustworthiness and accountability

- Safety and robustness: Critical in, e.g., power systems and industrial operations
- Interpretability and auditability: Critical in, e.g., policymaking contexts

Centering equity and climate justice

- Centering diverse stakeholders: E.g., industrial agriculture vs. smallholder farmers
- Avoiding centralization of power: Democratized access to capacity and compute
- Avoiding digital colonialism: E.g., smart meters, analysis of remote sensing data

Climate Change AI

Educational resources

Summer School - upcoming edition:

- Virtual (July-August 2026)

Tutorials & other entry points



Conferences and events

Workshop series

- AI/ML venues and beyond

Events at UN Climate Change Conf.



Funding programs

Global research funding for impactful projects

Climate Change AI Innovation Grants

Announcing a **\$1.8M grants program** for projects at the intersection of AI and climate change

- Funding of up to \$ **150K** for **year-long** research projects
- Supporting projects involving AI or machine learning that address problems in **climate change mitigation, adaptation, or climate science**
- Focus on fostering **pathways to impact** and the creation of catalytic **datasets**

Community



- Calls for Submissions
- Funding
- Projects & Courses
- Readings
- Jobs

Thought-leadership reports

Reports aimed at researchers, practitioners and policymakers

CLIMATE CHANGE AND AI

Recommendations for
Government Action

Climate Change AI

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