AI & GHG Subjects

By John Benson

Posted November 2026

1. Introduction

It seems like in the last month or so, I've been assaulted from every angle by AI (artificial intelligence). It serves me right, about a month ago I started reading a really comprehensive book on this subject written by an expert. This paper, in part, will be a review of this book (in section 2), but there is so much new material on AI, it may need to go to multiple volumes.

The second subject of this paper is related to AI, but only in that AI will probably help save our environment from the increasing anthropomorphic (human-caused) GHG (greenhouse gas) in our atmosphere.

2. The Coming Wave

The author of this book (main title is the same as this section-title) may be one of the best qualified authors I've ever encountered, especially given the subject of this book (AI). The text below is from the "ABOUT THE AUTHOR" page in the book:

MUSTAFA SULEYMAN is the CEO of Microsoft AI. Previously he was CEO and cofounder of Inflection AI. Before that, he co-founded DeepMind, one of the world's leading AI companies, and after a decade there, he became vice president of AI product management and AI policy at Google…[1]

I bought this book as a paperback, and it is a bit less than 300 pages long. I'm a pretty fast reader, except when I encounter a book with a huge amount of content that I am interested in. This book certainly fit that description, and then some. This easily took me about twice as long (over 2 months) to read as any other book of this length.

2.1. Excerpt

The following excerpt was important to me personally. I will send you to a 3-part post I made in Energy Central regarding this experience driving this importance after the excerpt and at the end of this subsection.

The coming wave, however, could make a range of small, state-like entities a lot more plausible. Contrary to centralization, it might actually spur a kind of "Hezbollahization," a splintered, tribalized world where everyone has access to the latest technologies, where everyone can support themselves on their own terms, where it is far more possible for anyone to maintain living standards without the great superstructures of nation-state organization.

Consider that a combination of AI, cheap robotics, and advanced biotech coupled with clean energy sources might, for the first time in modernity, make living "off-grid" nearly equivalent to being plugged-in. Recall that over just the last decade the cost of solar photovoltaics has fallen by more than 82 percent and will plunge further, putting energy self-sufficiency for smaller communes within reach.

[1] "The Coming Wave", by Mustafa Suleyman, The first paperback edition, Crown Publishing Group. https://www.amazon.com/dp/0593593979?lv=shuf&hvlocphy=86839&linkCode=df0&psc=1&hvnetw=o&hvadid=80883033959931&hvbmt=be&hvlocint=&hvdev=c&hvocijid=7681693075473473483-0593593979-&hvqmt=e&hvexpln=0&tag=bingshoppinga-20&hvtargid=pla-4584482516180195&channelId=69&ref_=asc_df_0593593979&plpRedirect=mhFallback

As electrification of infrastructure and alternatives to fossil fuels percolate, more of the world could become self-sufficient-but now equipped with an infrastructure of AI, bio, robotics, and so on, capable of generating information and manufacturing locally.

Three-Part Post:

Rooftop Solar Energy Tug of War, Part 7, implementation and results

This paper, as planned, is the final episode in this very long series on residential solar energy projects in California, and this part, the prior parts 5 and 6 (below) are specifically about my project. The prior part of this paper is linked in the Intro of this paper, and part 5 is linked in the Intro of part 6.

https://energycentral.com/c/cp/rooftop-solar-energy-tug-war-part-7-implementation-and-results

Rooftop Solar Energy Tug of War, Part 6, Selection, Survey & Design

This paper will focus on the project phases between and including the contractor selection, the site survey and the creation and approval of the design.

https://energycentral.com/c/cp/rooftop-solar-energy-tug-war-part-6-selection-survey-design

Rooftop Solar Energy Tug of War, Part 5, Real World Project

This paper contains:

- *Brief explanation of likely California solar (plus storage) tariff going forward.*
- *Sample Specification with clarifications*
- *Brief comments on bidding process*
- *Management issues to focus on during proposal cycle:*
    - *Fairness*
    - *Few bidders*
    - *Prequalification*

https://energycentral.com/c/cp/rooftop-solar-energy-tug-war-part-5-real-world-project

3. AI and Greenhouse Gas (GHG) Emissions

My first step in writing this section was to ask my own personal AI, Microsoft Bing Browser's AI-enabled search-tool (thank-you Mustafa, see the beginning of section 2) "How might artificial intelligence help us remedy anthropomorphic greenhouse emissions?" Since it gave a really good response, with references, I will repeat that response below, and use its references to expand it.

3.1. How AI Can Help Reduce Anthropogenic GHG Emissions

Artificial intelligence (AI) can play a transformative role in cutting human-caused greenhouse gas (GHG) emissions by improving efficiency, enabling better decision-making, and accelerating innovation across key sectors.

3.1.1. Optimizing Energy Systems

AI can improve the efficiency of power generation, grids, and storage. For example, machine learning models can forecast renewable energy output, optimize dispatch, and balance supply and demand in real time.

With the world on a path to fail to meet the Paris Agreement's goal to keep warming under 1.5° Celsius, there is an urgent need to accelerate climate action. To get back on track, a substantial reduction in emissions—to 57% of 2010's level—is required by 2030. And leveraging AI for climate change has enormous promise given the technology's strength in understanding and modeling complex systems.[2]

Accelerating Climate Action with AI—a new BCG report commissioned by and co-authored with Google—finds that deploying today's AI technology and scaling has already proven that AI applications for climate can significantly reduce global greenhouse gas (GHG) emissions. Moreover, it outlines how AI can also substantially enhance climate-related adaptation and resilience efforts and shape climate-friendly behaviors. It also discusses AI's potential to contribute to groundbreaking scientific discoveries — for example, in nuclear fusion — that open new avenues for action.

The report also spotlights early success stories, explores AI-related risks and options to address them, and summarizes opportunities for policymakers and business leaders to maximize the benefits and minimize the risks of AI for climate change.

Six Takeaways on AI for Climate Change:

1. By scaling currently proven applications and technology, AI has the potential to unlock insights that could help mitigate 5% to 10% of GHG emissions by 2030—and to significantly bolster climate-related adaptation and resilience initiatives.

2. Beyond helping to reduce emissions and enhance the resilience of communities and infrastructure, AI can accelerate climate action by taking climate modeling to the next level, enabling new approaches to climate education, and supporting breakthroughs in climate science, climate economics, and fundamental research.

3. AI's strengths in curating information, enhancing prediction, and guiding optimization can speed progress in three crucial areas:

- *Mitigating emissions*
- *Supporting adaptation and resilience to unavoidable climate impacts*
- *Enhancing the state of the art in climate modeling, climate economics, climate education, and climate-related basic research*

4. While AI is only just starting to be applied to climate challenges, leading-edge organizations and use cases are already achieving real results—and demonstrating the potential of AI for climate change if adopted at scale. And 87% of executives believe AI has potential to address their climate challenges.

5. AI, of course, also poses risks—data center emissions, water use for data center cooling, and electronic waste as well as broader concerns about equity and privacy—that must be managed thoughtfully. However, organizations have options and are already taking steps to mitigate risks…

[2] Amane Dannouni and Stefan A. Deutscher, Boston Consulting Group, "How AI Can Speed Climate Action," https://www.bcg.com/publications/2023/how-ai-can-speedup-climate-action

6. Policymakers have three critical oversight roles to play in maximizing the benefits and minimizing the risks of AI for climate. The report details three critical policy outcomes, offering a potential list of supporting policy moves and policy examples for each:

- *Enabling AI for climate progress by encouraging data sharing, ensuring affordable technology access, building awareness, and investing in talent.*
- *Accelerating the deployment of AI for climate by defining public and private sector priorities, delivering on public sector use cases, and encouraging private sector action.*
- *Promoting environmentally and socially responsible deployment of AI.*

3.1.2. Enhancing Industrial and Building Efficiency

AI-driven process optimization can reduce energy consumption in manufacturing, transport, and buildings. Smart building systems, predictive maintenance, and AI-controlled HVAC can cut emissions from operational energy use.[3]

The first ICEF[4] *Artificial Intelligence for Climate Change Mitigation Roadmap was released in December 2023. Since that time, attention to artificial intelligence (AI) has continued to grow at a rapid pace. Tens of billions of dollars have poured into AI projects, policymakers around the world have considered new AI policies, and OpenAI reports that each month more than 200 million people now use ChatGPT.*

Signs of a changing climate continue to grow as well. Based on global average temperatures, July 22, 2024 was the warmest day ever recorded; 2023 was the warmest year ever recorded; and the 10 warmest years on record are the past 10 years. Yet global emissions of greenhouse gases continue to climb.

Can AI help cut emissions of greenhouse gases? This Roadmap explores that question. In this second edition of the Artificial Intelligence for Climate Change Mitigation Roadmap, a team of 25 co-authors builds on last year's roadmap—comprehensively updating all old chapters, adding six new chapters and offering 5–10 specific, actionable recommendations in each chapter. The goal is to provide a useful resource for experts and non-experts alike (see footnote 4).

3.1.3. Supporting Climate Modeling and Policy

AI can process vast datasets to improve climate models, forecast extreme events, and simulate policy scenarios. This enables more accurate emissions inventories, targeted interventions, and evidence-based climate policy.[5]

With the world on a path to fail to meet the Paris Agreement's goal to keep warming under 1.5° Celsius, there is an urgent need to accelerate climate action. To get back on track, a substantial reduction in emissions—to 57% of 2010's level—is required by 2030. And leveraging AI for climate change has enormous promise given the technology's strength in understanding and modeling complex systems.

Accelerating Climate Action with AI—a new BCG report commissioned by and co-authored with Google—finds that deploying today's AI technology and scaling has already proven that AI applications for climate can significantly reduce global greenhouse gas (GHG) emissions.

---

[3] https://transitiondigital.org/ai-climate-roadmap

[4] Innovation for Cool Earth Forum, https://icef.go.jp/roadmap/

[5] By Amane Dannouni, Stefan A. Deutscher, et al, Boston Consulting Group, How AI Can Speed Climate Action, November 20, 2023, https://www.bcg.com/publications/2023/how-ai-can-speedup-climate-action

Moreover, it outlines how AI can also substantially enhance climate-related adaptation and resilience efforts and shape climate-friendly behaviors. It also discusses AI's potential to contribute to groundbreaking scientific discoveries that open new methods for climate action.

3.2. Artificial Intelligence Potential for Net Zero Sustainability

Reducing greenhouse gas emissions is just one step in a much broader goal of Net Zero. In other words, obtaining our resources for humanities future societal and technological evolution and growth from existing resources such as:

- Refuse
- Recycled outdated technology
- Existing identified subsurface resources (that is, existing mines and wells)
- Natural or agriculturally grown resources
- Resources from existing bodies of water (aquatic plants and other organisms)

The urgent need to address climate change and transition to a sustainable future has propelled the exploration of innovative solutions across various sectors. In recent years, artificial intelligence (AI) has emerged as a powerful tool with the potential to significantly contribute to mitigating climate change and achieving the ambitious goal of net-zero carbon emissions. The background of this nexus lies in the recognition of the dire consequences of climate change, including rising global temperatures, extreme weather events, biodiversity loss, and threats to human health and well-being. Governments, organizations, and individuals are increasingly acknowledging the need for immediate and effective action to combat these challenges.[6]

AI, with its ability to process vast amounts of data, analyze complex patterns, and make informed predictions, has the potential to drive transformative changes in areas such as energy, transportation, agriculture, and waste management. By harnessing the power of AI, it becomes possible to optimize energy systems, enhance renewable energy integration, improve resource efficiency, develop intelligent transportation networks, and facilitate sustainable practices in various domains such as education and finance.

Recent empirical evidence underscores the profound impact that AI can have on sustainability initiatives. Smart manufacturing processes facilitated by AI can decrease energy consumption, waste, and carbon emissions by 30–50%, with similar reductions achievable in energy usage within buildings.

In the transportation sector, intelligent systems have been shown to cut carbon dioxide emissions by approximately 60%, offering a significant leap toward cleaner urban environments. Moreover, about 70% of the global natural gas industry is now leveraging AI to enhance the accuracy and reliability of weather forecasts, which in turn optimizes resource use and operational planning. Additionally, illustrate how corporate operations have benefited from AI integration, where AI-driven decision-making and prediction tools have notably reduced carbon costs, substantiating the efficacy of AI in corporate sustainability strategies. AI could be used in sustainable business models in agri-food systems, thus reducing their carbon footprints.

[6] David B. Olawade, Ojima Z. Wada, Aanuoluwapo Clement David-Olawade, et al, "Artificial intelligence potential for net zero sustainability: Current evidence and prospects," 2024, Next Sustainability, Volume 4, https://www.sciencedirect.com/science/article/pii/S2949823624000187

Author's comment: Per a query of Microsoft Bing AI, *Over the last 100 years, global mean sea level rose by roughly 6–10 inches, per tide gauges and satellite data.*

The rise has not been uniform, with some regions experiencing slightly higher increases due to local factors such as land subsidence or local ocean currents. In the continental United States, for example, sea level has risen about 10–12 inches over this period.

Since your author lives in the San Francisco Bay Area, this time of year the coastal flooding that results from this sea-level rise, our current King Tides[7] along with other factors mentioned below.

As of late October 2026, San Francisco Bay water levels are about 1 foot (≈ 12 inches) higher than what standard tide tables predict, due to a Kelvin wave from El Niño.[8]

Many roads that are close to the Bay and Ocean are frequently flooded.

Since the U.S. and the World are nowhere near cures for anthropomorphic greenhouse gas emissions, we can plan on more (probably accelerating) global warming and its many secondary and higher order impacts to society.

However, we know how to greatly reduce greenhouse gas emissions: generate most of our power from renewable technologies (like wind, photovoltaic, hydro, geothermal, etc.) and nuclear (both fission and fusion as the latter technology matures). Also, once our electric generation approach zero-carbon, we can cure our transportation emissions by transitioning it to battery-electric technology for autos, busses and trucks.

From August 2025 through July 2026, fossil fuels supplied more than half of electricity consumed in the United States, at about 55%, while low-carbon sources supplied about 44%. Gas was the largest individual source, providing roughly 39%, followed by nuclear at 17% and coal at 16%. Within the clean electricity mix, wind supplied about 10%, solar 9%, hydropower 6%, and biofuels 1%. Solar's contribution included about 7% from utility-scale installations and 2% from behind-the-meter systems, such as rooftop panels. Nuclear remained the largest single low-carbon source, but fossil fuels still dominated electricity supply, contributing to climate change and air pollution.[9]

Final Author's comment: As I'm writing this comment I will post this paper tomorrow. Meanwhile I have finished "The Coming Wave" and started another book: "The Carbon Wave" by Leah Stokes, and am about 75% through it. "Although both of these books are good, "The Carbon Wave" is the better of the two. This is mainly because Ms. Stokes was/is an important White House and Congressional insider. Also Ms. Stokes book is more recent, being copywritten this year (2026). The Carbon Wave is highly educational on (at least) two fronts: human-caused climate change and how the Government works to pass major legislation. Ms. Stokes also personalizes this story, since she lived it. Details of her personal life contrast with the climate negotiations.

---

[7] King tides are the highest naturally occurring tides of the year, caused when the Sun, Moon, and Earth align during a new or full moon—especially when the Moon is at perigee and Earth is near perihelion—producing exceptionally high-water levels. These tides are predictable, occur several times a year, and can cause coastal flooding, erosion, and infrastructure impacts.

[8] Query of Microsoft Bing AI: "Currently how much above normal sea-level in the San Francisco Bay Area due to king tides?"

[9] From "Low-Carbon Power," https://lowcarbonpower.org/region/United%20States

I'm sure I will use "The Carbon Wave" as a major reference for many future posts. Also, I would recommend it to any very patient reader that is interested in anthropomorphic climate change and how the Government deals with this threat to our population. The "…very patient…" is because it is taking me two to three times as long to get to page 187 (out of 279 total main-text pages) as it would for most of my reads because of the huge information content.[10]

[10] Leah C. Stokes, "The Carbon Wave," ©2026, The MIT Press, https://www.amazon.com/dp/0262054779?lv=shuf&channelId=520&plpRedirect=mhFallback, Hardcover: $30.38.