MIT ALUMNI FOR CLIMATE ACTION

Earth Day April 22, 2025

Earth Day originated as a call to arms by US Senator Gaylord Nelson of Wisconsin, who hoped to draw on the grassroots movement for greater environmental consciousness to bring about positive policy changes 55 years ago. This year's theme is OUR POWER, OUR PLANET: inviting everyone around the globe to unite behind renewable energy, and to triple the global generation of clean electricity by 2030.

MACA Editorial: Staying the Course

The US has pulled out of the Paris Agreement for the second time. Globally 196 countries have signed this 2016 agreement, with the only holdouts being Iran, Libya, and Yemen (and now the US). The scientific justification for the global transition from fossil fuels to renewable and carbon-free energy resulting from the Paris Agreement is overwhelming. Business as usual would lead to devastating environmental consequences, with irreversible impacts on human health and society.

The last two years were hotter than any time in the past 125,000 years and the world is already approaching and occasionally breaching the more ambitious 1.5 degree Paris Agreement target. The consequences are apparent from recent storms, droughts and fires as well as the spread of diseases, conflict, and migration. The 2 degree limit remains achievable for the end of the century, but we must act with urgency if we are to be successful.

The world has been making progress over the past decade to mitigate climate change primarily through increasing ambitions from the Paris Agreement's NDCs and rapid installation of price-competitive solar and wind energy, with a parallel shift to electrical equipment instead of fossil fuel combustion in buildings and transportation. Many countries and industries have already made sufficient commitments to and investments in this transition that carbon emissions may be peaking globally.

European and US emissions have been trending down in the past few years, and this trend will likely continue due to the economic imperative (renewables are cheaper) and public health co-benefits (reduced indoor and outdoor pollution). Globally, carbon emissions growth is also declining, and the US pulling out of Paris or even increasing fossil fuel production for a short time will not have more than a temporary effect on the clean transition underway.

The transition to net-zero emissions requires financing to the tune of a year's global GDP, around $ 100 trillion. This is likely to take decades (2050 is the Paris goal). Since the US is currently responsible for only around 11% of global emissions, the impact on climate change should be minimal, especially since we are likely to rejoin Paris in the future.

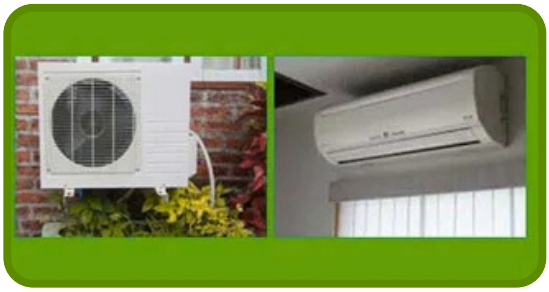
Over the next 4 years, the main impact will be the loss of US position, prestige, and reputation as a climate leader, just like in 2017. Fortunately, in 2021 we rejoined the Paris agreement, announced aggressive NDCs, and the following year passed the largest climate bill in history, the IRA, with $369 billion to address climate change.

The delays in US emissions reduction resulting from recently announced climate policies will unfortunately burden us with more climate disasters and human health and economic effects, but in the long term they are unlikely to have major global impacts. Climate activists in the US can still have an impact at the local and state levels by supporting this continued investment in renewable energy, and by advocating for policies that will continue to reduce emissions regardless of misguided federal action. We should stay the course with climate action for our own future, for future generations, and for the health of the planet.

In this newsletter:

MACA Report on Carbon Dioxide Removal (CRD)

The report, ***Carbon Dioxide Removal: Balancing Urgency with Scientific Unknowns***, prepared by Margaux Filippi, Martyn Roetter, Jeremy Grace, and Shiladitya DasSarma is now available. It makes recommendations for a path forward. Active removal of atmospheric carbon dioxide (CO_2) through carbon dioxide capture (CDR) and sequestration, along with the aggressive reduction of greenhouse gas (GHG) emissions, is necessary to achieve Net Zero carbon emissions. But there are two major challenges: reducing the cost and scaling up a CDR portfolio. The MACA team determined that it is paramount that careful planning be applied in the interest of the public good to achieve Net Zero by 2050, advocating for a phased approach for development and large-scale deployment. They determined that immediate needs in the current and following decades are to eliminate all possible emissions by transitioning to clean energy, and to protect and expand natural carbon sinks, while developing the technological and economic tools for additional carbon removal strategies. When R&D of novel technologies have produced reliable solutions for CDR, then scaleup and deployment should be prioritized for achieving Net Zero and ultimately Net Negative emissions and restoring Earth's atmosphere to an agreed safe level of greenhouse gas concentrations.



MACA's new Heat Pump Education Resource

There is a new resource for educating the public on **Residential Heat Pumps: What, Why, and How** on our education page. prepared by John O'Connell, Mike Schneider, William Booth, Jose Pareja, Jeffry Smith, Victoria Owens and Sudhakar Puvvada and led by Sudhakar and Victoria. The resource offers a simple guide to understanding heat pumps, easy-to-use tools for estimating savings, and resources for connecting with qualified installers. The MACA Education team focused on heat pumps because they provide a practical solution for homeowners, yet misinformation and technical jargon often cause confusion. Many people struggle to understand their benefits, costs, and how to choose the right system.

A heat pump is an energy-efficient system that transfers heat rather than generating it, making it far more efficient than traditional HVAC systems. In winter, it extracts heat from the air or ground and moves it indoors to warm a home, while in summer, it works in reverse, removing indoor heat and releasing it outside to cool the space. Powered by electricity, this process can deliver 3 to 5 times more heat energy than it consumes, reducing carbon emissions, lowering maintenance costs, and improving indoor comfort and air quality. Please share and distribute to folks in your community.

MACA Campus Group efforts featured in news article

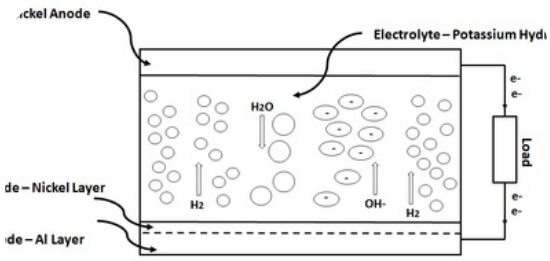
MACA Campus Group members, Susan Murcott, Herb Zien, and Rick Clemenzi along with their student group partners teamed up to form the MIT Thermal Energy Network (MITTEN), and called for implementation of advanced heating and cooling systems using low-temperature thermal energy from pipes connecting campus buildings on the MIT campus. The efforts were featured on January 29, 2025, in an article by P. McKenna, in Pulitzer Prize-winning *Inside Climate News* (the oldest and largest dedicated climate newsroom in the nation): ***As MIT Aims to Decarbonize, Competing Ideas Focus on Thermal Energy Systems***. In it, Herb was quoted saying that the "project will cost hundreds of millions of dollars less to implement, and cost 30 percent or more less to operate" than the system proposed by AEI (an outside consulting firm hired by MIT) to come up with a plan to decarbonize, or stop burning fossil fuels on campus for heating, cooling and electricity generation by 2050. Other universities have already saved millions in fuel costs through such balancing of heating and cooling needs with a low-temperature thermal energy network. It also was heartening to read that MIT recently partnered with other Boston-area institutions to help finance the building of solar and wind farms to produce clean energy in order to "offset fossil fuel power elsewhere, allowing MIT and other project partners to each claim a portion of the emissions reductions" MACA commends the Campus Group efforts! If you are interested in learning more, contact Campus Group Leader, **Susan**.

New MIT Vice President for Climate, Dr. Evelyn Wang '00

On January 28, 2025, MIT President Sally Kornbluth announced the appointment of the Institute's inaugural vice president for climate, Dr. Evelyn Wang '00, Ford Professor of Engineering. President Kornbluth stated: "As I have said many times, the accelerating problem of climate change and its countless impacts represent the greatest scientific, technical and policy challenge of this or any age. The Climate Project is MIT's strategic response". Dr. Wang is the former head of the Department of Mechanical Engineering. Recently she took a leave to serve as director of the Advanced Research Projects Agency – Energy (ARPA-E). She will report directly to the MIT President. In addition to leading fundraising and implementation, Dr. Wang is tasked with shaping the Climate Project's strategic vision. Dr. Wang returned to the MIT campus on April 1, 2025 to lead the Climate Project at MIT. MACA looks forward to engaging with the Vice President, and wishes her great success in this critical effort!

MACA entrepreneurship

The MACA entrepreneurship group, led by Faraji Whalen-Robinson, held a meeting featuring Ronnie Newman of Groundswell Community Power, which builds community power for those needing energy savings the most. Their southeast Rural Power coalition was awarded a $156 Million regional *Solar for All* contract to help build community solar and storage projects to serve more than 17,000 families. Ronnie talked about the RFI to identify developers, installers, and other contractors to participate in the program. Contact Faraji to learn more about, or to join the MACA entrepreneurship group.



Opportunity to help implement a NEW Clean Energy patent

US 12,087,951 B2: ELECTROCHEMICAL CELL INTEGRATES ELECTROLYSIS AND FUEL CELL FUNCTIONS
Peter Hermansen is looking to connect with others in the field of electrochemistry (electrolysis cells, fuel cells) who are interested in implementing his new patent. The approved patent is for a sealed electrochemical cell that can power an external load, utilizing energy stored in an electric field at the interface between a bimetal cathode and an alkaline electrolyte and serving as a source of clean, renewable energy. Contact **Peter** to learn more about how you can get more involved.

MACA President named 'Sustainability Champion' at University of Maryland

The University of Maryland, Baltimore honored MACA founder and president, Shiladitya DasSarma by naming him Sustainability Champion on April 3, 2025. The award was in recognition of his long-standing dedication to research, conservation and education in the field of sustainability, including the development of an innovative course on climate change, health, and society at the university.

The University announcement stated that the "*School of Medicine professor has been focusing on the environment in his research and his personal life for years*." His time as a graduate student at MIT and with MACA were also acknowledged. See the full story here: ***Sustainability Champion Series: Shiladitya DasSarma*** in The Elm.

Fill out our Climate Adaptation survey

As we draw close to, or surpass, crucial climate change parameters (such as average global temperature increases), the probabilities of very significant climate impacts on people, organizations, governments, and natural systems – everything – increase.

To date, climate action has overwhelmingly focused on preventing serious impacts and has contributed to significant progress on climate challenges. Even so, serious impacts are now occurring and worse impacts are expected. Planning and preparing for these challenges can reduce their serious or even dire impacts.

Starting now to prepare for the challenges will prevent some impacts that an unprepared world would otherwise suffer. While we must continue to do our best to prevent climate change, we should now start preparing for the impacts that can no longer be prevented.

If you are interested in helping, please fill out **this survey** from Jim Stiles.

Add your voice: share news and ideas on MIT Open

MIT Open invites the community to *Learn. Share. Connect*. The website is where “learners, teachers and scientists worldwide meet with MIT”. All MACA members are invited to join and contribute opinions and share articles on the **MACA channel**. To do so, please fill out this **form** to sign up for MIT Open's MACA channel!

To learn more, email **Rick Clemenzi**, channel moderator.

MACA
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Thank you to all who filled out the winter 2025 banner poll!

Though all of the banners were popular with most people, option 5 (above) got the most stars. It is somewhat tempting to add "MACA-Make America Cool Again" as a subtext...

Starting next month, we will be rolling out the new banner on our MACA sites and, of course, the news letter as well. Let us know if you want to help with this effort by contacting **info@MACA.earth**.

We welcome contributions to the MACA Newsletter

Send in your updates, announcements and events for the next quarterly newsletter via this NEW **submission form** to share with the MACA Community.

Looking for volunteers

MACA needs your help! Is your passion advocacy/ policy, justice, entrepreneurship, technology, education, or campus-related? Let us know ways in which you want to engage with us. After the last two summers' heat waves, storms, floods, and wildfires, and the world passing the 1.5 ºC Paris target, the fight against climate change is more urgent than ever. We need volunteers for creating content and more. Email us at **info@maca.earth** to get (more) involved.

Get involved, help grow our membership, and make an impact

- To facilitate dissemination of meetings and minimize overlap of events, Liliana Pimentel has set up a New MACA Calendar, which can be found at **MACA Meeting Calendar**. Please add your events and listings!

- Help our community grow - *it takes a member to bring in a member* - invite your fellow Alumni to join MACA. MIT Alumni can join by filling out the **form here**. Non-MIT Alumni can be sponsored and can join as MACA affiliate members by filling out the **form here**.

- YOU can organize MACA events with your local MIT Clubs and you can request a MACA panel for local or online **events here**.

- Help us create content for our social media sites: **YouTube**, and **LinkedIn**. We need volunteers to organize and maintain these. If interested, send an email to **info@MACA.earth**.

- Remember to also check out **MACA.Earth** webpages for more news and information.

Reading tips

From Liliana Pimentel:

- **2024 Climate Technology Progress Report: Unleashing renewable energy for ambitious NDCs** For MACA's analysis and suggestions on the topic, read the **MACA's Roadmap** or listen to the roadmap podcast.
- **January 2025 was the warmest January globally, (1.75°C above pre-industrial levels)**.
- **UN Secretary-General emphasizes how renewables are revitalizing economies (92% of 2024 new electricity capacity come from renewables).**
- "***A year above 1.5 °C signals that Earth is most probably within the 20-year period that will reach the Paris Agreement limit***".

Upcoming Events

- April 10, 2025 1:00 - 2:15pm EDT Join Climate XChange's experts to learn more about ***EPA's Climate Rollbacks and How States Can Fill the Gaps***. **Registration** is required.
- Starting Saturday, April 22, the **Smithsonian Institution** in Washington DC, honors Earth Day with free programming including Hands-On Gardening Workshops, Film Screenings, Talks and Tours.
- On April 22, 2025, 9:00 am-5:30 pm EDT, the National Academies (USA) will hold the 2nd annual ***Climate and Health Summit*** (see **agenda here**) featuring strategies and actions that can be taken to improve the resilience of public health critical infrastructure through a **recent workshop**. **Registration** is required.

The Road to COP30 in Belém, Brazil

Liliana Pimentel reminds us that the Conference of the Parties (COP) 30 will be hosted in Belém, Brasil, 10-21 November 2025. To learn more, you can visit the **host official page**, watch an **interview** with President-Designate, Ambassador André Aranha Corrêa do Lago or read his letter to the community or see how you can get involved with COP on the **United Nations Climate Change** page.

MACA Strategic Plan

The Strategic Planning Committee is developing goals and initiatives for 2025-8. Recommendations will be presented to MACA's Board, and a written report in the fall will be open for MACA community feedback. To give input and learn more, contact **info@MACA.earth**.