

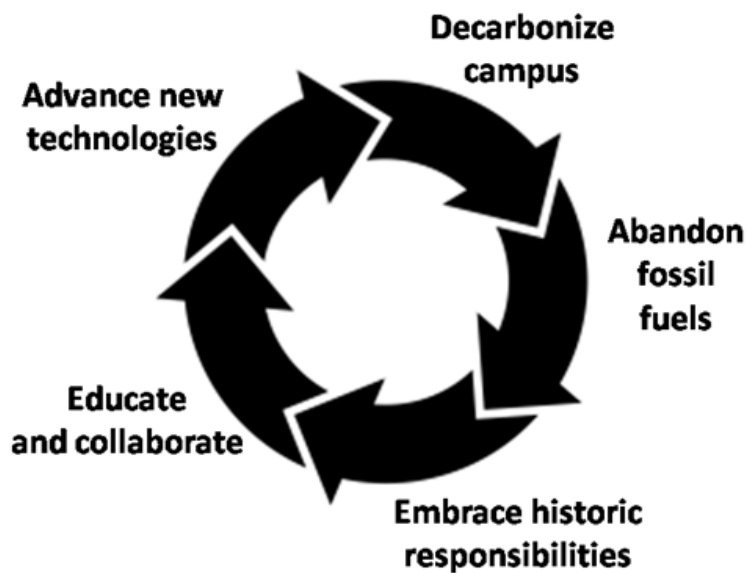
MIT Alumni for Climate Action

Framework for discussion

The MACA team has developed a motif for what MIT's bold climate action might look like, in preparation for President Kornbluth's meeting with our alumni group on March 10, 2024. The diagram shows a *positive feedback loop*, a kind of regenerative amplifier which extracts the maximum amount of energy from a system. Here is an example of how this could work: Advancing new technologies (which is what we do!) provides ways

to further decarbonize the MIT campus, accelerates abandoning fossil fuels, demonstrates MIT's commitment to its responsibilities, provides many ways to educate and collaborate, which will in turn advance new technologies ... and so it goes.

Breakthrough pathway to climate action leadership



President Kornbluth has emphasized the need for a Roadmap to find a route through this complex system. MACA developed such a [Roadmap](#) during its initial activities. The MACA Roadmap highlights some of the commitments needed for climate action leadership, including an all-hands-on-deck approach and a willingness to collaborate at all levels. MIT faculty, staff, students, and

alumni need to work together with the administration coordinating efforts according to the diagram. The MIT President's office in conjunction with the MIT Alumni Association should help to involve and integrate the energy and entrepreneurial spirit of MIT alumni along with students and faculty. Collaborations should be encouraged wherever and whenever possible within and outside of MIT to advance climate action.

In summary, MIT should demonstrate climate action leadership by incorporating humanity's response to the climate crisis at every scale on campus and beyond - in its research portfolio, pedagogy, and engagement with alumni and peer institutions. 'Mind, heart, hand and earth' should be our new slogan. The world needs MIT's full commitment as a climate action leader to be on the right side of history. The climate challenge represents an opportunity for all of MIT to serve humanity.

Let's take a closer look at each of the key steps.

Advancing new technologies

MIT leads in research on a wide range of technologies critical for sustainability and decarbonization. Continuing to innovate is critical to climate action leadership. A few examples include:

- Basic research on engineered photosynthetic systems to capture solar energy, cyclic use of hydrocarbon resources (converting to materials which can be recycled, rather than destroying via combustion), "green" fuels (particularly for "difficult" sectors such as aviation and ocean shipping), fusion energy, and safe and deployable nuclear fission.
- Engineering development of Zero Emission Vehicles (including electric vehicles), decarbonization of emissions intensive industries such as steel, cement, and fertilizer, resilient and renewable-friendly electric power grid, energy storage for transportation and grid-scale use, and carbon capture and storage, when thermodynamically and economically feasible.
- Championing "Advanced District Geothermal Heat Pumps and Grid-Tuned Thermal Storage" as a 5th Generation District Energy innovation for decarbonizing MIT's campus.
- Social, economic, and political requirements needed to introduce these technologies and advance public acceptance at scale

Plan for 100% Decarbonization of the MIT campus by 2035

Accelerate 100% MIT campus buildings decarbonization with a goal of:

- 2035 - target year for zero greenhouse gas (GHG) emissions;
- leading to 5-year payback, then positive return on investment (ROI+), with
- minimal disruption to campus functions during construction and operation.

This 100% [Decarbonization Plan](#) for "Advanced Geothermal Heat Pumps and Grid-Tuned Thermal Storage," presented at the MIT Energy and Climate Poster Session on 10/20/23, would make MIT a climate leader by adopting goals in line with U.N. Secretary General António Guterres' June 15, 2023 *Accelerated Agenda* for developed countries to supercharge their efforts to commit to reaching a net-zero goal as early as possible (well ahead of the current Fast Forward plan and the Paris Agreement) and in line with the City of Cambridge's Building Energy Use Disclosure Ordinance (BEUDO) Amendments. It also addresses intergenerational climate justice, insofar as today's MIT students would have a better future if MIT would lead on its own decarbonization in the near term, in parallel with supporting longer term innovations and addressing national and global climate challenges.

Disengaging from fossil fuels

The time has come for MIT to accept and make full commitment to this critical goal, abandoning fossil fuels, both as energy sources and for financial support.

- While fossil fuels have been the solution to many and most of humanity's greatest problems, we have to admit and embrace the fact that the nature of climate change requires us to keep fossil fuels in the ground. To do otherwise would be suicide.
- But we should leave a window open for those fossil fuel centered companies which participate in consortia such as MITEI and MCSC, so as to encourage their decarbonizing. Their decarbonization is essential to their future businesses as well as to society and the planet's ecosystems, if these companies can add value to our efforts in disengaging from fossil fuels. As one example, oil companies possess expertise in drilling which can be applied to geothermal energy development.

MIT's historic responsibilities

MIT has risen to challenges in the past, such as:

- The "Rad Lab"'s all in effort to develop radar at scale during the 1940's, which materially contributed to the outcome of World War II as well as leading to the omnipresence of radar in today's weather forecasting and commercial aviation.
- The "March 4" anti-war teach-in 55 years ago galvanized the campus, received national recognition, and directly led to the formation of the Union of Concerned Scientists, now a prominent organization for promoting science and sustainability.

To fully embrace our historic responsibly toward climate change, MIT should:

- Partner internationally to provide the guidance needed to help develop solutions beyond our borders. Our responsibilities include addressing development of local solutions and the pollution created from petrochemical products which contaminate our environment, ecosystems, and even the human body.
- Take a stand on climate justice, domestically and globally. We could, for instance, lead in technology development for climate adaptation and resiliency impacting the most vulnerable, mapping global regions critical for climate justice, and investigate the combined forces of demographic change, climate refugees, and migration.

Educate and collaborate

- MIT is one of the world's leading sources of highly skilled and motivated people. Outreach to students will help focus attention on the climate issue, through

campus campaigns and recognition of faculty, staff, and alumni climate champions as role models.

- Develop educational materials and delivery modes with these objectives for a wide range of potential audiences, including expanding online resources for an ever larger audience.
- Leverage our 170,000-strong alumni/ae community, through MITAA and other organizations, to help promote better understanding of the climate crisis and combat misinformation and disinformation.
- Collaborate with peer institutions and others to develop the human resource talent and technological breakthroughs which will be needed to meet the challenge of the climate crisis

In summary, MIT should demonstrate climate action *leadership* by incorporating humanity's response to the climate crisis at every scale on campus and beyond - in our research portfolio, pedagogy, and engagement with alumni. 'Head, heart, hand and earth' should be our new slogan. The world needs MIT's full commitment as a climate action leader. The climate challenge represents an opportunity for all of MIT to serve humanity.

"If not us, then who? And if not now, when?"

Shiladitya DasSarma, MIT PhD '84, MACA President
On behalf of MACA's Board of Directors
October 23, 2023