

MIT Alumni for Climate Action

Feb 28, 2024

Memo To: Richard Lester, Vice Provost & Professor of Nuclear Science & Engineering

From: Susan Murcott on behalf of MIT Alumni for Climate Action (MACA): Rick Clemenzi '81, Computer Engineering; John Dabels '79 Sloan; Shiladitya DasSarma, '84, Biochemistry; Judy Siglin, MACA Affiliate; David T. Williams '82 (affiliated with '81), Mech. E; Herb Zien '73, Sloan Management

Re: Proposal for MIT Community Engagement in Rapid Decarbonization of MIT Campus by 2035.

In our memo to you of December 14, 2023, we provided you with the following:

1. MACA Climate Framework document,
2. Abstract of the MACA 2035 Decarbonization Plan,
3. MACA, D-Lab Poster “Plan for Rapid and Cost-effective Decarbonization of MIT Campus by 2035 via 6th Generation* District Heating and Cooling with Advanced Thermal Storage” from October 20, 2023 MIT Energy & Climate Poster Presentation.

We also made the following requests, which are updated and expanded here:

- **Sally Kornbluth’s New Climate Initiative:** We are thrilled with the new Climate Project at MIT. In addition to being outward facing, Sally Kornbluth’s 2024 climate initiative should set a goal of MIT 100% decarbonization of the MIT campus buildings by 2035 on its path to becoming fossil fuel free, not only in its physical plant, but in its operations, transport, investment portfolio, etc. so that MIT is walking the talk as well as showing the world a way forward.
- **MACA/Geo@MIT Advanced Plan for Rapid and Cost-effective Decarbonization of the MIT Campus by 2035:** We ask that our Campus HVAC Decarbonization Business and Technical Plans created and presented by MACA alumni experts and MIT students be given a thorough engineering, economic, and impact analysis review by appropriately experienced and qualified experts. These two plans represent a singular opportunity for MIT to lead in the area of 6th Generation* Buildings/Campus Decarbonization.
- **MACA/Geo@MIT Proposal Demonstration on One Building or Building Cluster:** We request that review and approval be given to undertake a pilot demonstration of our decarbonization plan on a small cluster of buildings, starting with a full digital twin presentation and assessment, and proceeding to physical implementation.
- **Campus Decarbonization Teach-ins and Town Hall-style Events:** We request that MIT initiate events where all MIT community voices are invited to come forward with their insights, knowledge and experience. The upcoming “Conversation with Sally

Kornbluth” (March 10th, 2-3 pm) is an excellent opportunity to give MIT alumni a chance to meet our new President. We propose that this forum be the start to a dialogue with alumni concerned about more rapid campus decarbonization while also expanding engagement with students and the broader MIT community.

With this memo, we are providing you with the current MACA/Geo@MIT “Campus Plan for Rapid and Cost-Effective Decarbonization of MIT Buildings by 2035,” which is comprised of:

- **Campus Decarbonization Introduction and Business Plan:** (Working Draft)
- **Technical Plan (v1)**
- [Video of our MACA/Geo@MIT Proposal](#) (10 min)

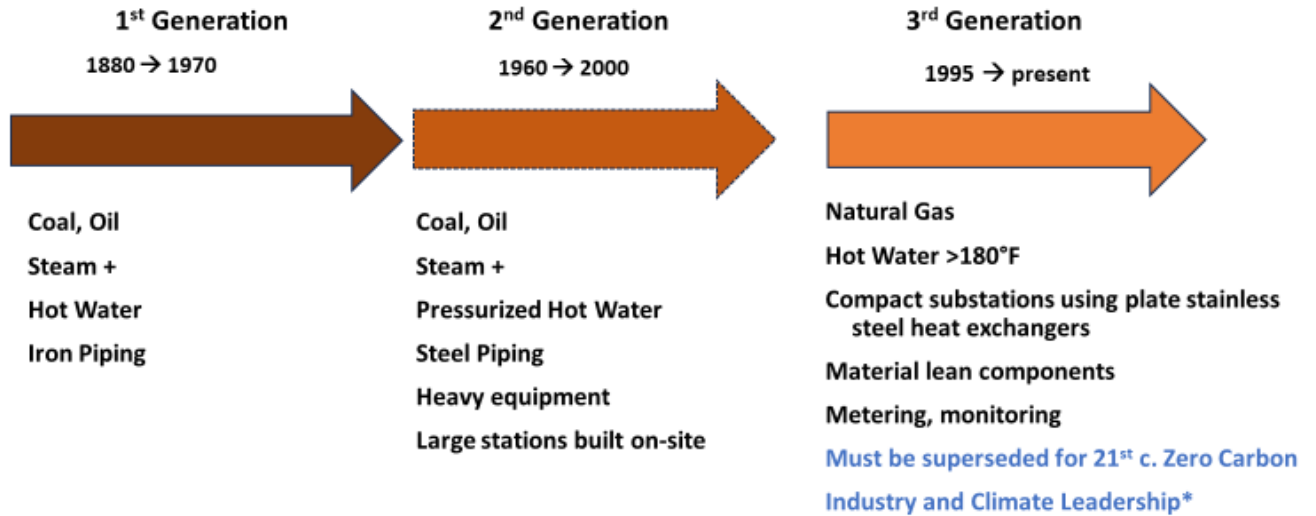
Richard, in your book Unlocking Energy Innovation you describe “The Real Energy Innovation Opportunity: “Doing much better with what we already know” (p.25). Our plan does exactly that. We are not trying to imitate either Stanford’s or Princeton’s decarbonization paths. Our plan moves beyond the costly and campus-disrupting plans other leading universities have adopted which we think are not appropriate for MIT. Those plans are neither cost effective, leading edge, nor taking advantage of unique IRA cost-saving opportunities with its very significant refundable tax credits to non-profits. This plan could be appropriate for a huge swath of campuses across the country and the world. The MIT Administration’s Plan/consultants are taking us down a highly expensive, conservative, 4th Generation approach that will be obsolete by the 2050 year when it is slated to be completed. Our 6th Generation plan can be completed in 10 years if we start now.

You go on to write that “most of the heavy lifting will have to be done by technologies whose basic science and engineering characteristics are already well-known, but whose performance has the potential to be improved along several dimensions”. Our 6th Generation* Plan accomplishes exactly those goals of applying available technologies and will complement the emerging clean energy grid for a load and operational cost optimal solution. Moreover, we are confident that this Plan can be accomplished by 2035 at a fraction of the capital cost of the MIT Administration/Decarbonization Working Group’s proposed 4th Generation Plan* (approximately \$250 million vs \$750 million).

We look forward to the opportunity to discuss the business and technical features of this plan in our meeting this Thursday 2/29 from 10:00-10:45 am and to learn your perspective and concerns about decarbonizing MIT.

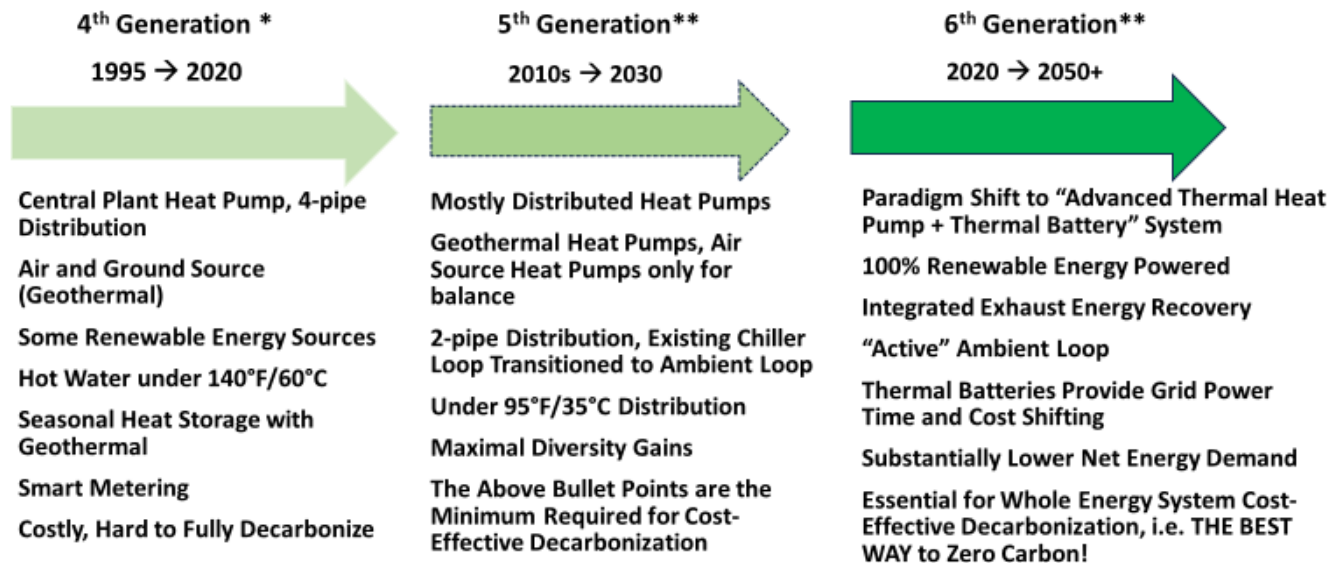
* For a short summary of the Evolution of District HVAC Systems, see charts below:

Fossil Fuel-Based District HVAC Evolution



* MIT is currently completing a 3rd Generation District upgrade. Their mid temperature hot water is currently 180°F-212°F.

Heat Pump-Based District HVAC Evolution



* Examples: Stanford, Princeton, Ball State

**Advanced Thermal System leaders propose distributed 5th or 6th Generation approaches as the quickest way to Zero Carbon