

Support the scaling of technologies to extract carbon from the atmosphere and permanently store it in geologic or natural stocks.

## Connecting Outcomes to Goals

| Net-Zero Emissions  | Resilience  | Increasing Social Equity  |
|---|---|---|
| Removing carbon from the atmosphere mitigates the impact of unavoidable and historical emissions. | Removals are the final mitigation step to avoid catastrophic climate change. Some nature-based approaches enhance ecosystem resilience. | Removals are essential for fulfilling global climate equity once mitigation is exhausted, but premature efforts come at a cost of local climate equity. |

## Progress Assessment

Carbon dioxide removal (CDR) is not a substitute for a rapid reduction of greenhouse gas emissions from fossil fuel use. Eventually, CDR will be a necessary complement to Boston's greenhouse gas mitigation efforts to roll back the impact of past and unavoidable future emissions. Boston has been responsible for generating greenhouse gas emissions for two centuries and is locked in to doing so for years to come. CDR is a mechanism to eventually repair this legacy. Yet, there is no capability to directly facilitate CDR within the city.

Frameworks for meaningfully incorporating CDR into climate goals likely will evolve at state and national scales. Currently many organizations voluntarily procure offset credits from CDR projects to claim that they are a net-zero entity. Some Boston area institutions are regrettably pursuing this non-strategy to claim to be "climate neutral"<sup>113</sup> or "net zero."<sup>114</sup> This type of premature CDR—and especially that which relies on dubious offset crediting programs<sup>115,116</sup>—misses opportunities to realize local co-benefits of emissions reductions by diverting investment away from local action. Leading organizations have instead sought to fill a gap in federal action by stimulating the development of high-quality CDR.<sup>117,118</sup> These exemplars focus less on accounting and crediting and more on facilitating the growth of CDR.

Only when local emissions reduction efforts approach maturity can robust CDR practices contribute to global climate justice by repairing past harms. Society needs to be prepared to subsidize removals for the sake of achieving global climate justice.

By 2050, removals should match residual emissions. After 2050, removals will need to rise relative to residual emissions. This net negative phase is essential to rectifying past emissions in order to avoid the worst impacts of climate change;<sup>61</sup> however, the ability of these strategies to cost-effectively scale is uncertain. All CDR strategies involve various cost, resource, energy, and ecosystem tradeoffs.<sup>119</sup> Given tradeoffs associated with various CDR strategies, they must be deployed in a way that avoids exploitation of communities that will host CDR.<sup>120</sup>

## Equity Implications & Indicators

**Removals:** When efforts to mitigate emissions are exhausted, Boston's investment in removals are an indicator of additional action to pursue global climate justice.

## Big Lifts

**There is no big lift at this time.** Aside from appropriately supporting research and development of CDR, Boston should focus on direct emissions reductions first as they bring local and global benefits. Pursuing removals will require a lift that recognizes the need to repair the impacts of past and currently unavoidable harms that place the world's vulnerable at risk.

People understand the urgency; they need agency. Climate march. (Source: Li-An Lim/Unsplash)

