Carbon Free Boston:

How We Will Reach Carbon Neutrality by 2050

Executive Summary – 2.28.18

The Carbon Reduction Imperative

Climate change is affecting the planet in mostly negative ways, causing a range of stresses to natural systems and human beings. In Boston climate change, brought about by a superabundance of greenhouse gases in the global atmosphere, is causing higher seas, flooding, and hotter weather. Credible analysis predicts these problems will exacerbate in the future. Scientists and activists agree that carbon emissions must be lowered dramatically, and many leading countries and cities around the world have promised to do so, per the Paris Climate Treaty. Consistent with that effort, Boston has pledged to reach carbon neutrality* by 2050. The challenge today, for Boston and most other cities, is how to execute on the promise.

Although we will enjoy a cleaner, healthier, and more economically vibrant city as we transition, it will not be easy to shift from incumbent carbon-based fuels (which emit greenhouse gases) and 20th century delivery systems to the highly-efficient, renewables-based, distributed, electrified economy that carbon neutrality demands. Meeting the City's goal will require us to change how we create and distribute electricity, heat our homes and offices, transport people and goods, and handle waste. Moreover, social equity concerns and impacts need to be recognized and taken into account in the new energy environment.

Carbon Free Boston's Importance & Urgency

In order move Boston toward carbon neutrality, Mayor Walsh asked the Boston Green Ribbon Commission to analyze the technological and policy options that are actionable for the City and will lead to the desired outcome. To that end, the Green Ribbon Commission is partnering with Boston University's (BU's) Institute for Sustainable Energy to quantify the most effective combination of technologies and policies to reduce greenhouse gas emissions across the electric power, buildings, transportation, and waste sectors (the major sources of greenhouse gas emissions in the City.). The Carbon Free Boston initiative output will be highly specific, policy-driven strategies to transition from carbon-based fuels to 100% clean and renewable energy sources in every sector of the economy by 2050.

As part of the work, the BU team will develop 2030 and 2050 strategy options for inclusion in the City's 2018 Climate Action Plan Update. Although 2050 is 32 years away, it is important to start this work now because we will be making choices in the next 10-15 years that will affect our ability to achieve our 2050 targets. Boston needs to have clarity about the "end state" that we are trying to achieve so that we can make mid-term choices that are aligned with that end state.

Large uncertainties remain about how our carbon free future will evolve. The rate of technology change and innovation is expected to accelerate over the coming decades, and this will create challenges and opportunities that we can't yet anticipate. Moreover, in some areas, the City has limited influence. Nevertheless, there are still important choices we can make, and it is possible to establish a framework for specific 2030 strategies that the City can pursue, in the context of the ultimate goal of achieving a carbon neutral status by 2050.

Project Design

The Carbon Free Boston project will have four phases through the end of 2018 and will require extensive collaboration with state and regional players who control key energy, transportation, and building decision-making. The table below summarizes the phases and timing on the Carbon Free Boston initiative.

The Carbon Free Boston Project Phasing, Timeline, and Deliverables	
Phases	**Deliverables**
Phase 1: Initiative Design *(January – June 2016)*	• Design and key partner engagement • Fundraising • Launch at the June 2016 GRC meeting
Phase 2: Sector-Specific Model Development *(July 2016 – September 2017)*	• Assemble technical groups to advise on the development and execution of electric power, buildings, transportation, and waste modeling • Develop a deep decarbonization modeling platform to support City strategy development
Phase 3: Model Runs, Review, and Revision *(October 2017 – July 2018)*	• Convene Social Equity Task Force to review model output • First draft of preliminary report released internally • Technical advisory groups review draft • Consultants revise model parameters based on working group feedback and rerun models • Repeat process through second and third drafts
Phase 4: Carbon Free Boston Report Writing and Release *(September - October 2018)*	• Presentation of options to the City of Boston to support strategic decision-making for the 2018 Climate Action Plan update • Public release of Carbon Free Boston report

Conclusion

A successful Carbon Free Boston initiative will support rapid action towards the City's long-term decarbonization goals:

- A shared positive vision of our carbon-free future;
- Shared understanding of the options for achieving that future and the trade-offs involved in them;
- Stakeholder groups that are committed to working on strategy implementation; and
- A sense of urgency and willingness to make tough shorter-term choices to enable a carbon-free future.