



Climate Innovations Study Tour High Level Takeaways

July 11, 2016

- **We can achieve a carbon-free and climate ready Boston while supporting a robust economy:** It is entirely possible, with existing and emerging technologies, to simultaneously accomplish:
 - Long-term resilience to climate impacts, including more intense precipitation (“cloudbursts”) and sea level rise (Amsterdam, Rotterdam, and Copenhagen to varying degrees)
 - A carbon-free economy (Copenhagen)
 - High quality of life and a robust economy (Amsterdam, Rotterdam, Copenhagen, and Malmo)
- **Progress requires new capacity for governance, financing and regulations:** These need to be aligned across sectors at multiple scales
 - The level of investment is orders of magnitude larger than what we have organized to date for climate mitigation or adaptation in the Commonwealth or Boston
 - Ex: Copenhagen flood resilience plan committing \$5 billion in investment over 15 years and the Netherlands’ annual \$1 billion investment in water management, including maintenance of its dyke system
 - The host cities had mechanisms for raising taxes for climate resilience and governance structures in place that were insulated from quick political changes
 - Ex: Water management boards and the Delta Commission in the Netherlands provide dedicated institutions and revenue raising mechanisms for managing water
 - Planning horizons need to be longer. Host cities planned for 2100. Planning for flood frequencies in these countries is based on 1/1000 and 1/10000 risk thresholds – as opposed to 1/100 year storms in Boston and the US.
 - Boston cannot handle multiple meters of sea level rise; beyond two meters will require major land use changes and expense.
- **Boston needs a compelling shared vision for climate change action:** That vision needs to be supported by aggressive goals and a communications strategy to create alignment across sectors and across scales
 - Need to reframe the challenge of climate change as the opportunity to improve quality of life, bringing positivity, a sense of urgency, and sense of possibility to Boston
 - Ex: “Co-Create Copenhagen” a liveable city: the world’s best city for cyclists, better everyday life, and more nature in the city
 - Develop a vision for how Boston will live with water and thrive on clean energy in the midst of its climate vulnerabilities
 - Ex: “Rotterdam Water City” vision for a resilient delta city by 2035
- **All climate investments need to create new value for the community while integrating already existing challenges of social and economic equity:** Climate projects can serve multiple functions and add to the quality of life in the city (e.g. ensuring safety or improving public health,

increasing access to green space and cooler microclimates, or promoting economic development). Perhaps the most important lesson from the trip!

- Investments should be adaptable to transitions and uncertainty about the future
 - Ex: the Netherland's previous big engineering project approach of building flood barriers vs. focus now on more adaptable, flexible projects and no-regrets investments
- Show that being a green leader is good for business and the economy
 - Ex. Investments in Copenhagen creating a stable business environment, companies locating to Malmo without any economic incentives needed, and Denmark's energy use decreasing while the economy grows making businesses more competitive
- City can embrace experimentation, innovation, and possibility
 - Ex. Making space for experimentation via impromptu rain gardens in Zoho in Rotterdam, Rotterdam's Rooftop days, and Copenhagen's creation of a temporary harbor beach to activate their waterfront
- **Strong need to engage citizens and build political will:** Need broader engagement with multiple stakeholder groups about climate planning and implementation. Need for building greater political will and cultivating climate champions.
 - **Social resiliency needs to be a part of climate resiliency.** Use adaptation and mitigation to build better neighborhoods, to create opportunities for citizens, and address existing social inequities.
 - Ex. Copenhagen's flood resilience project focusing on water catchment solutions in an underserved community that will simultaneously create green park space (Sankt Jorgens Lake)
 - Ex. Copenhagen's 25% affordable housing requirement that helps to counteract gentrification that can come with climate resilient development
 - Study tour delegation needs to continue working together and engage political leaders and constituents to activate political will
 - Immediate opportunities identified to hold hearings in the City Council and State Senate, to pilot projects testing ideas seen in the host cities (e.g. expanding district energy), to encourage a climate and energy bill at the state level, and to take proactive steps ahead of the U.S.-China Climate Summit
- **Development as a key space for climate action.** Need to require more action as part of development in the city
 - Regulation and requirements were a key part of the success of the host cities, including requiring green development, energy efficient buildings, and ensuring that development matching climate plans and goals
 - Ex. Copenhagen's Climate Secretariat that reviews all development and ensures it aligns with climate goals and plans
 - Ex. The Edge building in Amsterdam was designed initially to meet EU energy performance standards for buildings, but then found it desirable to go well beyond minimum standards and add a number of other high tech features to create a value niche. It has the world's highest BREEAM rating for an office building.

- Encourage action, both mandatory and voluntary, on private land. Incentivize change at the street level.
 - Ex. Rotterdam’s focus on requiring and incentivizing water management on private land in the city

- **Shift the mandate of existing institutions.** Position public agencies and quasi-public agencies to serve a broader purpose that supports climate action.
 - Municipal ownership, cooperative ownership structures, or private buy-in into utilities combined economic return with a broader mandate around climate and emissions reductions
 - Ex. 50% of the owners of the Middelgrunden wind farm are citizen investors
 - Ex. Copenhagen’s city-owned utility, HOFOR, has a mission of serving customers and reducing carbon emissions
 - Ex. Amsterdam’s “water recovery” frame rather than wastewater management
 - If existing agencies do not exist to manage climate challenges, need to create new governance structures
 - Ex. Water governance structure in the Netherlands at all level of government (municipalities, regional water management boards, national government).

- **For success, implementation will need to happen at expansive scales:** Programs and actions will need to extend far beyond pilot or demonstration projects (“from a few rooftop gardens to square kilometers of rooftop gardens”)
 - However, there is value in taking incremental steps and many solutions in the host cities started this way
 - Ex. Green roofs and infrastructure in Rotterdam (“large scale implementation of small scale solutions together with citizens”) and Copenhagen’s transition towards a bicycle friendly city beginning with incremental steps
 - Testing and measuring results to prove efficacy is important
 - Copenhagen’s work implementing pedestrian and bike infrastructure via pilot projects, evaluating/testing the impact, and using the results to take the next step

- **Crisis compels serious action:** In all the locations we visited, their level of resolve and willingness to commit serious resources to climate solutions was motivated by some kind of crisis, which led to leapfrogging through technologies:
 - Netherlands – major national floods
 - Copenhagen – 1970s threat to energy security; economic collapse in the 1990s; recent floods from cloudbursts
 - Malmo – loss of their industrial economy
 - Challenge to Boston and the Commonwealth is to proactively prepare before the next disaster. How to become a globally recognized leader for doing such?

- **Challenges remain for the host cities.** While every place we visited has some area of exceptional best practice, no place was succeeding on all fronts. Each host also had areas of weakness.
 - Amsterdam and Rotterdam – less progress on transitioning to clean energy and citizenry have become complacent/not engaged on resiliency issues



- Copenhagen – not yet dealing with sea level rise; relying on waste incineration and biomass for “clean” energy
- Boston and Massachusetts have expertise that can be shared with host cities on climate mitigation and adaptation