GWSA Implementation Advisory Committee (IAC)

November 19, 2019, 1:00PM – 5:00PM

U.S. Coast Guard Base Boston, 427 Commercial St., Boston, MA

(Approved 2/26/2020)

New Undersecretary for Climate Change, David Ismay, started the meeting at 1:04PM, welcoming everyone, giving an overview of the meeting, and introducing and welcoming Eugenia Gibbons of Green Energy Consumer Alliance as a new IAC member.

Undersecretary Ismay asked for an IAC member/delegate to chair the IAC's Electric Sector Work Group as he can no longer chair that work group. Eric Wilkinson nominated himself as chair of the Electric Sector Work Group, with a second from Dan Gatti and unanimous approval from the IAC.

Undersecretary Ismay also posed whether the IAC should have a work group on social equity. Discussion followed about the importance of the topic and the need to include equity considerations in the current work groups' discussions. Several IAC members/delegates suggested having a separate Social Equity Work Group with representation from each of the sector work groups. Undersecretary Ismay called for a vote to form a separate Social Equity Work Group with further details to be discussed and decided by that work group. A motion was made by Jack Clarke, seconded by Eric Wilkinson, and unanimously passed by the IAC.

Undersecretary Ismay gave the IAC a moment to review the draft minutes of the last IAC meeting on August 22, 2019, and called for a vote to approve the meeting minutes. A question was raised on the minutes and whether a net-zero pathway was being modeled in the 80x50 Study; members of the IAC confirmed that it would be addressed and had been included in the 8/22 minutes. A motion to approve was made by Jack Clarke, seconded by Eric Wilkinson. The minutes were unanimously approved.

Claire Miziolek of EEA reminded the IAC members to fill out the new delegate designation form for the upcoming calendar year, even if the delegate remains the same. If an official IAC member is retiring, EEA can discuss reappointment.

There were no updates from state agencies.

With no further IAC business, the IAC meeting ended at 1:25PM and the Scenario Workshop for the 80x50 Study began. See the Appendix for a summary of the Workshop.

Documents or exhibits used at the meeting (posted online[1]):

1. Meeting agenda
2. Meeting/Workshop Slide deck
3. Meeting minutes of August 22nd, 2019[2]

IAC Member/Delegates in attendance

[1] https://www.mass.gov/event/november-19-2019-meeting-of-the-gwsa-implementation-advisory-committee-iac-2019-11-19t130000

[2] https://www.mass.gov/event/august-22-2019-meeting-of-the-gwsa-implementation-advisory-committee-iac-2019-08-22t130000

Organization	Name
A Better City (ABC)	Yve Torrie
Boston University	*(absent)*
City of Boston	Katherine Eshel
Conservation Law Foundation (CLF)	*(absent)*
Dismas House / Commonwealth Green Low Income Housing Coalition	*(absent)*
Environmental Entrepreneurs (E2)	Sarah Simon
Environmental League of Massachusetts (ELM)	Eric Wilkinson
Fraunhofer Center for Sustainable Energy Systems (CSE)	*(absent)*
Green Energy Consumer Alliance	Eugenia Gibbons
Mass Audubon	Jack Clarke
Massachusetts Institute of Technology (MIT)	Sebastian Eastham
Massachusetts Municipal Wholesale Electric Company (MMWEC)	Kate Roy
Metropolitan Area Planning Council (MAPC)	Cammy Peterson
National Grid	*(absent)*
Northeast Clean Energy Council (NECEC)	*(absent)*
The Nature Conservancy (TNC)	Steve Long
Union of Concerned Scientists (UCS)	Dan Gatti

Appendix

Massachusetts 80x50 Study Scenario Planning Workshop

Summary and Discussion Document: 11/26/2019

Tuesday, November 19, 2019 from 1:00 – 5:00 PM

U.S. Coast Guard Building, 427 Commercial Street, Boston, MA 02109

Introduction and Overview

The Massachusetts Decarbonization Roadmap ("80x50 Study") is an effort by the Executive Office of Energy and Environmental Affairs (EEA) to identify cost-effective and equitable strategies to ensure Massachusetts reduces greenhouse gas emissions by at least 80% by 2050. The project will produce a pathway for this reduction, incorporating policies and transitions across a range of sectors: buildings, transportation, electricity, non-energy, and land use. This pathway will be tested under a series of scenarios that represent potential futures in 2050 which the Commonwealth should plan for in their deep decarbonization efforts.

To ensure the tested scenarios capture a sufficient range of plausible 2050 futures and incorporate expert feedback, as part of the meeting of the Global Warming Solutions Act (GWSA) Implementation Advisory Committee (IAC) on November 19, 2019, EEA hosted a Scenario Workshop to gather stakeholder feedback on the key components of scenarios and to foster discussion of potential scenarios. The workshop was intended to support the development of policies that can position Massachusetts to achieve its greenhouse gas reduction commitments despite current and future uncertainties.

During the Scenario Workshop, stakeholders received an update on the 80x50 Study progress and worked together to:

1. Engage with the study's scenario approach, including the utilization of scenario components to capture key trends and linkages of the components; and
2. Present their perspectives on key scenario components and plausible futures.

The workshop resulted in a collection of stakeholder insights on specific current and future uncertainties that have significant implications for GWSA compliance in 2050. The feedback will be used to inform the development of 3-4 modeling scenarios and numerous modeling parameters. A GWSA-compliant emissions reduction pathway will be developed for each scenario – and will ultimately be used to inform design of a policy portfolio that will be resilient across the identified future scenarios. This document includes a high-level summary of the workshop.

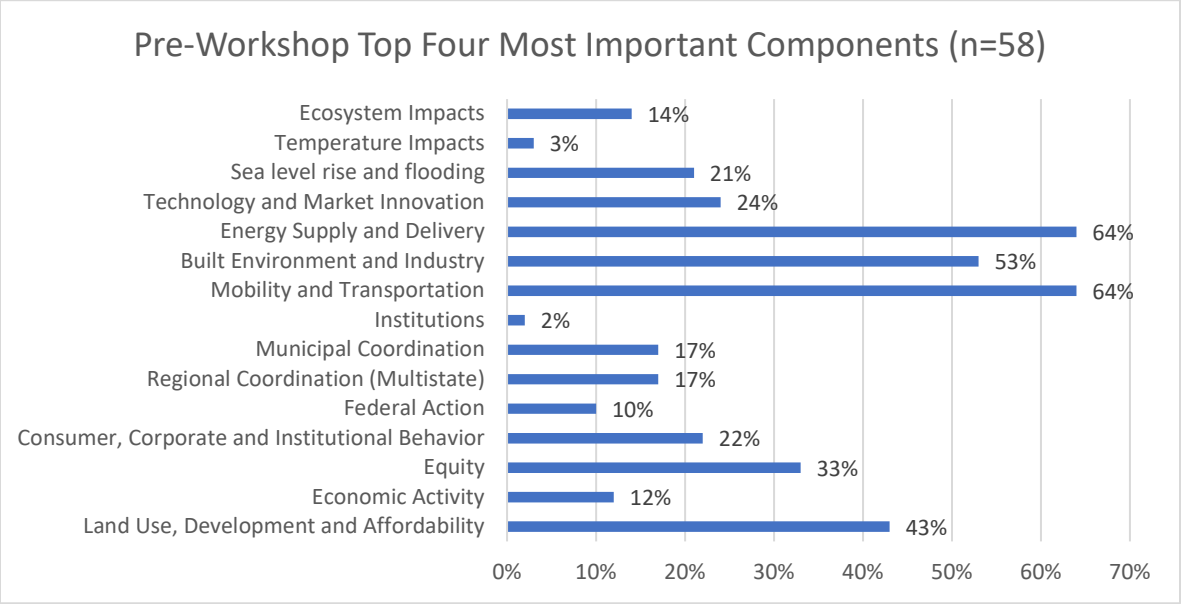
Workshop Summary

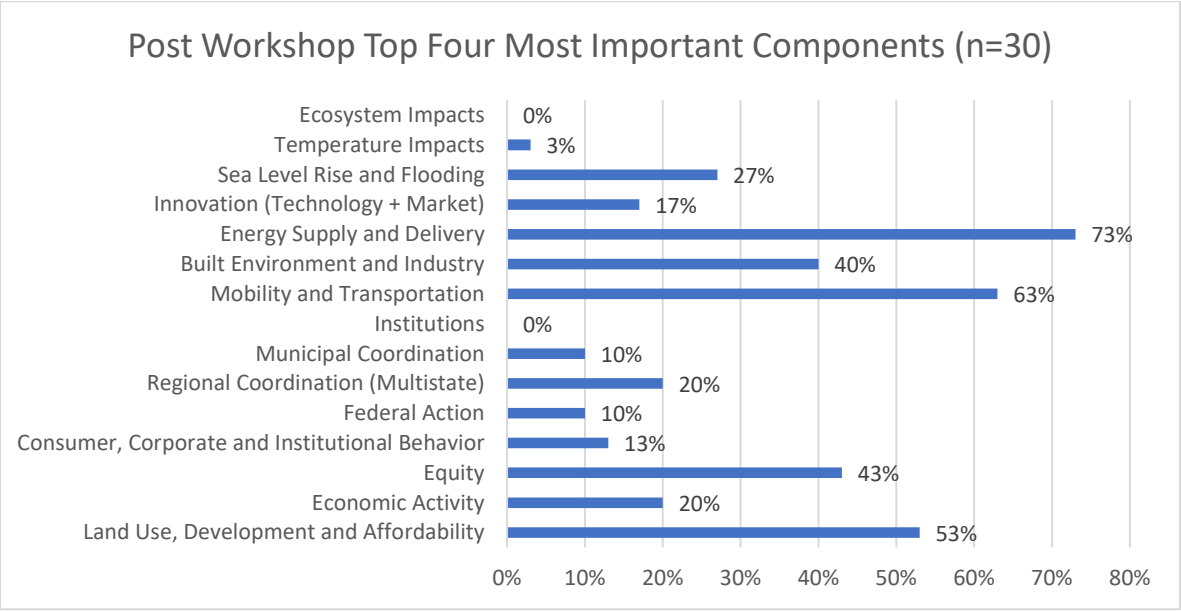
On 11/19, 106 individuals met at the US Coast Guard Boston Base to discuss and provide feedback to the scenario planning process for EEA's 80x50 project. The workshop began with a formal meeting of the GWSA IAC, after which Cadmus staff presented a high-level overview of the 80x50 Study as well as the background and reasoning for scenario planning. The meeting then broke up into 11 small groups where facilitators walked workshop participants through an exercise to identify and prioritize scenario components that they deem most important to consider when assessing Massachusetts' pathway to decarbonization. The participants were also asked to identify key trends for each prioritized component and the important linkages between components. Afterwards, each group developed a short narrative

of a potential future in 2050, and used an online polling platform to share their scenario narrative with the larger group. Participants were able to vote, in real time, for the scenario that most resonated with each individual. The workshop concluded with a summary of next steps, including the process for the feedback provided during the workshop to be incorporated into several scenarios that would inform the policy analysis and final products for the 2030 Clean Energy and Climate Plan as well as 2050 Roadmap report.

Participant feedback

Workshop participants were asked to share their feedback and priorities both before the workshop and the day-of. The full feedback from the workshop is being analysis and compiled, but some of the initial high-level pieces of feedback are reported below.





Several word clouds were produced showing which words were most commonly used by participants.

Word cloud of uncertainties (pre-workshop):

Word cloud from scenario narratives:

Word cloud on linkages between scenario componets:

Background on Scenario Analysis

With respect to climate change planning, scenario analysis is the process of analyzing potential future greenhouse gas emissions by assessing a range of alternative conditions and policies. It enables researchers to account for uncertainties in future conditions and incorporate qualitative descriptions in addition to quantitative indicators, which is beneficial for articulating changes that cannot easily be quantified (e.g., political instability).

Scenarios capture key changes in various aspects of society, including demographics, socioeconomics, lifestyle, policies, institutions, technologies, and climate, which then allow researchers to anticipate potential challenges to mitigation and adaptation. Once defined, scenarios can be used for qualitative evaluation of strategies in the context of each scenario. Further, scenarios can be parametrized as quantitative inputs for data-driven modeling efforts.

A number of existing scenario frameworks exist at the local, national, and international levels. For example, the Shared Socioeconomic Pathways (SSP) Framework includes five pathways that represent different mitigation and adaptation challenges on the international scale. On the local level, the MBTA has developed the Focus 40 scenarios to aid in transportation planning, and MAPC has developed the draft MetroCommon Scenarios as part of Greater Boston's regional long-range plan.

In a similar fashion, the 80x50 Study is also employing a scenario approach. The project team is looking to stakeholders to help craft scenarios that capture potential futures in the Commonwealth that should be explored as the Commonwealth charts a path toward decarbonization.

Scenarios are intended to capture influences that are external to the system being studied. For the 80x50 study, we are interested understanding how external factors may influence how the *Commonwealth pursues policies and climate mitigation.* Such influences could include top-down components such as federal policy or bottom-up components such as individual behavior, institutional leadership or municipal coordination. The final set of scenarios in this study will be distinctly defined to cover a range of possible future trends that will influence the impacts of state policy.

Key Terms

The Study and Scenario Workshop materials employ a series of key terms to frame the analysis and guide discussion. Terms with which stakeholders should be familiar include:

Pathway: A suite of outcomes that achieves a set of policy goals. In this case, the overall goal is GHG emissions reduction. In the 80x50 Study, the suite of outcomes and policies that will achieve at least 80% by 2050 is referred to as the 80x50 Pathway.

Scenario: An internally consistent storyline outlining driving forces, critical assumptions and uncertainties, and how these forces will impact the future in terms of the Commonwealth's ability to meet the 2050 targets. In the 80x50 Study, we will use scenarios to help explore what policies and programs will be necessary for the Commonwealth to achieve its at least 80% greenhouse gas reduction target, in spite of external factors outside of the Administration's direct control (e.g. federal policy).

Component: A factor that will impact the Commonwealth's ability to decarbonize and is outside of the Administration's direct control. These will be combined to help characterize and describe a current state

and potential future in the Commonwealth. Components are part of one of four categories: Socioeconomic & Lifestyle, Policy & Institutions, Technological Change, and Climate. In the Study, the components will be linked to specific modeling parameters to explore the impact of components on the achievement of the at least 80% by 2050 goal. The full list of components is found below in this pre-event document.

Trend: Ongoing or anticipated changes to components for which the Commonwealth should plan as they develop strategies for decarbonization.

Linkage: Identification of connections between components that are likely to trend together or in opposition to one another under a particular future scenario (i.e. Land Use, Development, & Affordability and Mobility & Transportation).

Decarbonization Components

The following 15 components are proposed as the foundation for scenario development. Varying levels of these components will influence the scenarios and modeling parameters used by the Study. These components are introduced during the Scenario Workshop, and stakeholders are asked to review and identify the components they believe are most important to decarbonization and the expected future impacts associated with them:

Component		Description
Socioeconomic & Lifestyle	**Land Use, Development & Affordability**	The extent to which, housing costs, land use policy, and open space influence migration, sprawl, private vehicle use, and forest cover
	Economic Activity	The impact of economic trends, such as a boom in personal wealth or a recession, on space and energy demands and decarbonization investments
	Equity	The influence of current inequities, such as environmental injustice and income inequality, on climate mitigation actions
	Consumer, Corporate & Institutional Behavior	The examination of how individual and institutional behaviors and level of concerns about climate change influence decisions about technology adoption
Policy & Institutions	**Federal Action**	The adoption and implementation of federal policy focused on decarbonization: CO_2 price, federal transit investment, R&D, RPS, limiting fossil fuel extraction, etc.
	Regional Coordination (Multistate)	The degree of successful collaboration across multiple states regarding current policies and new initiatives: e.g., RGGI and TCI
	Municipal Coordination	Local level, cross-town coordination to develop climate-conscious infrastructure and housing
	Institutions	Examination of the role of public trust in the government, science, and the media and the strength of these institutions

Technological Change	**Mobility & Transportation**	The extent of transformation and level of investment within transportation and transit systems including improved EV service, new modes (e.g., microtransit), autonomous vehicles, deployment of charging equipment, etc.
	Built Environment & Industry	The transformation of new construction and existing facilities within the built environment and industry, particularly around efficiency and electrification
	Energy Supply & Delivery	The exploration of level of deployment of carbon free energy technologies and the capacity of infrastructure to deliver energy generated by those technologies
	Innovation (Technology & Market)	The extent and speed at which technological advancements (e.g. storage, grid modernization), R&D investments and workforce development support and influence the decarbononization trajectory
Climate	**Sea Level Rise & Flooding**	The impacts of climate change and adaptive efforts on the ability for coastal communities maintain and continue to grow population and economic activity
	Temperature Impacts	The impact of climate change on winter and summer temperatures, and its subsequent effect on heating and cooling energy consumption
	Ecosystem Impacts	The influence of higher CO_2 levels and elevated temperatures on biological productivity and carbon sequestration

Full Workshop Attendee List

First Name	Last Name	Organization
Michael	Ahern	WPI
Ajla	Aksamija	University of Massachusetts Amherst
Toby	Armstrong	Sustainable Energy Advantage
Lauren	Bauman	New Ecology
Lisa	Bjerke	Citizen
Jonathan	Buonocore	C-CHANGE
Vallery	Cardoso	EEA
David	Cash	UMass Boston
H.G.	Chissell	Advanced Energy Agency
Hong-Hanh	Chu	EEA
Callie	Clark	MHP
Jack	Clarke	Mass Audubon
John	Cleveland	Green Ribbon Commission
Elizabeth	Cleveland	MassCEC
Shanna	Cleveland	Barr Foundation
Susan	Coakley	NEEP
Barry	Coflan	Schneider Electric
Leah	Cohen	Independent Contractor
Emily	Cole	American Farmland Trust
Daniel	Collins	New England Power Generators Association
Stephen	Cowell	E4TheFuture
Sarah	Creighton	DCAMM
Julie	Curti	Cadmus
Ben	D'Antonio	NESCOE
Samantha	Devine	City of Boston
Paul	Disarcina	AvalonBay Communities
Dan	Dolan	New England Power Generators Association
Deborah	Donovan	Acadia Center
Eric	Dubin	Mitsubishi Electric Trane HVAC
Michael	Duclos	DEAP Energy Group, LLC
Sebastian	Eastham	Massachusetts Institute of Technology
Aurora	Eddington	Cadmus
Kat	Eshel	City of Boston
Patricia	Fabian	Boston University
Ian	Finlayson	MA DOER
Matt	Frank	National Grid
Louisa	Gag	LivableStreets Alliance
Betar	Gallant	MIT
Isabella	Gambill	A Better City
Dan	Gatti	Union of Concerned Scientists

Eugenia	Gibbons	Green Energy Consumers Alliance
Sucharita	Gopal	Boston University
Elizabeth	Hanson	Cadmus
Kasia	Hart	Metropolitan Area Planning Council
Rebecca	Hatchadorian	Arup
David	Hill	VEIC
Tom	Hopper	Mass Housing Partnership
Ariel	Horowitz	MassCEC
Meg	Howard	MassCEC
David	Ismay	EEA
Emily	Jones	LISC
Chelsea	Kehne	Department of Energy Resources
Chris	Knittel	MIT
Allison	Kreiley	EEA
Jonathan	Krones	Independent Contactor
Damon	Lane	VEIC
Chad	Laurent	Cadmus
Steve	Long	The Nature Conservancy
Amy	Longsworth	Boston Green Ribbon Commission
Zeyneb	Magavi	Gas Leaks Allies (HEET/Mothers Out Front)
Maggie	McCarey	DOER
Steve	McGorty	Avalonbay
Peter	McPhee	Massachusetts Clean Energy Center
Gilbert	Metcalf	Tufts University
Benjamin	Miller	EEA
Claire	Miziolek	EEA
Geoff	Morrison	Cadmus
Kate	Mueller	Cadmus
Galen	Nelson	Mass Clean Energy Center
Anastasia	Nicolaou	NAIOP MA
Anna	Pavlova	Schneider Electric
Cammy	Peterson	MAPC
Sarah	Philbrick	MAPC
Desiree	Plata	MIT
Josh	Plisinski	Harvard Forestry
Rebecca	Quinones	MA Division of Fisheries and Wildlife
Bill	Ravanesi	Health Care Without Harm
Nick	Rekstad	Arup
Wilson	Rickerson	Converge Strategies
Kate	Roy	MMWEC
Staci	Rubin	Conservation Law Foundation
Tim	Scarpa	Avalonbay
Darci	Schofield	Metropolitan Area Planning Council

Sarah	Simon	E2
Catie	Snyder	DOER
Rishi	Sondhi	National Grid
Sumeeta	Srinivasan	Tufts University
Liz	Stanton	Applied Economics Clinic
Marian	Swain	DOER
Brian	Swett	Arup
Pamela	Templer	Boston University
Kate	Tohme	Department of Public Utilities
Yve	Torrie	A Better City
Ruth	Trimarchi	Citizen-Winchester
Joanna	Troy	DOER
Neil	Veilleux	Cadmus
Jim	Walker	Ameresco, Inc.
Michael	Walsh	Cadmus
Alexis	Washburn	DOER
Sharon	Weber	MassDEP
Eric	Wilkinson	Environmental League of Massachusetts
Andy	Winslow	NEEP
Joy	Woolley	Eversource Energy
Kathryn	Wright	Cadmus
Megan	Wu	DPU
David	Zeek	MA Sierra Club