



SF Environment

Our home. Our city. Our planet.

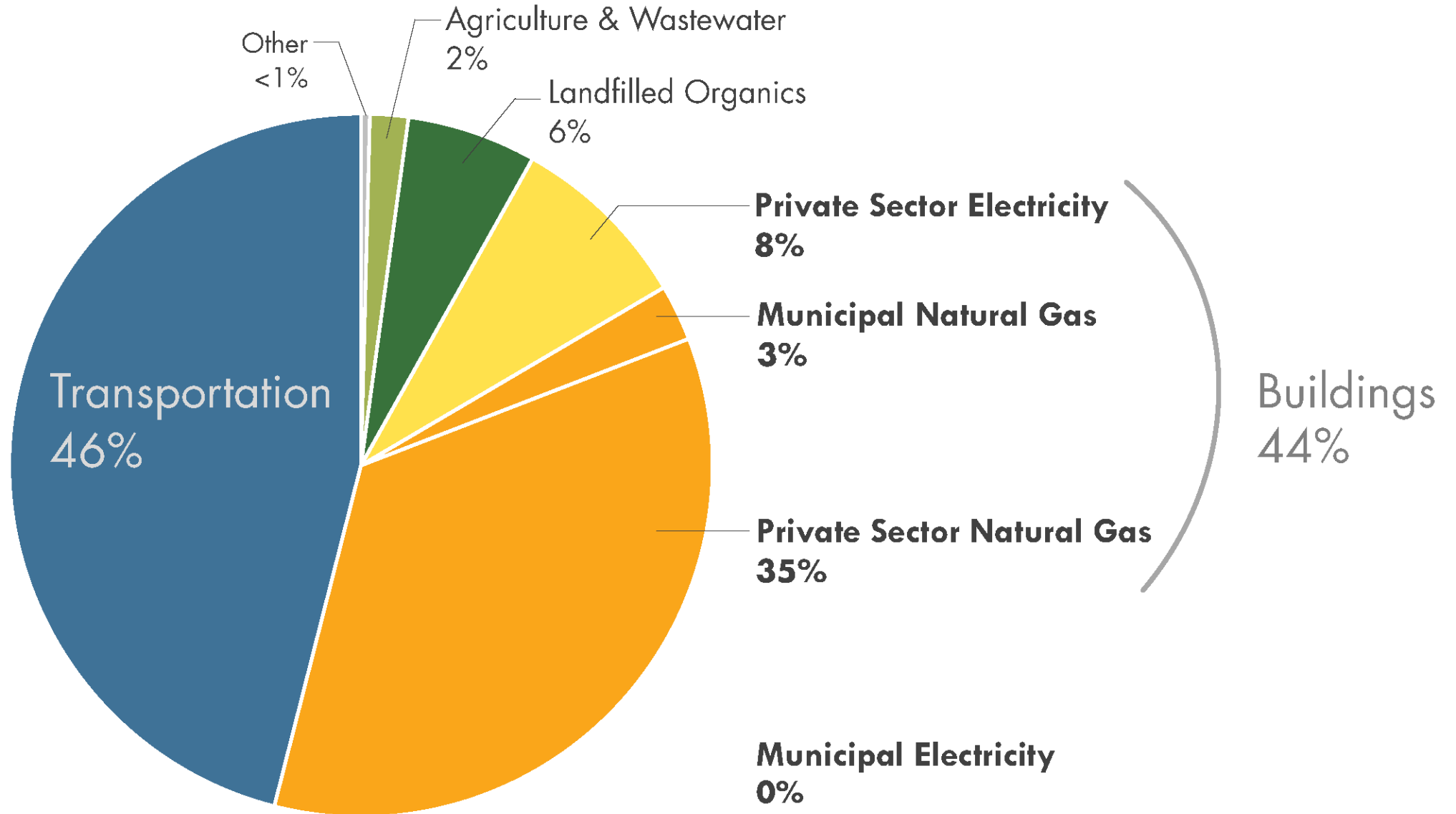
A Department of the City and County of San Francisco

Building Decarbonization

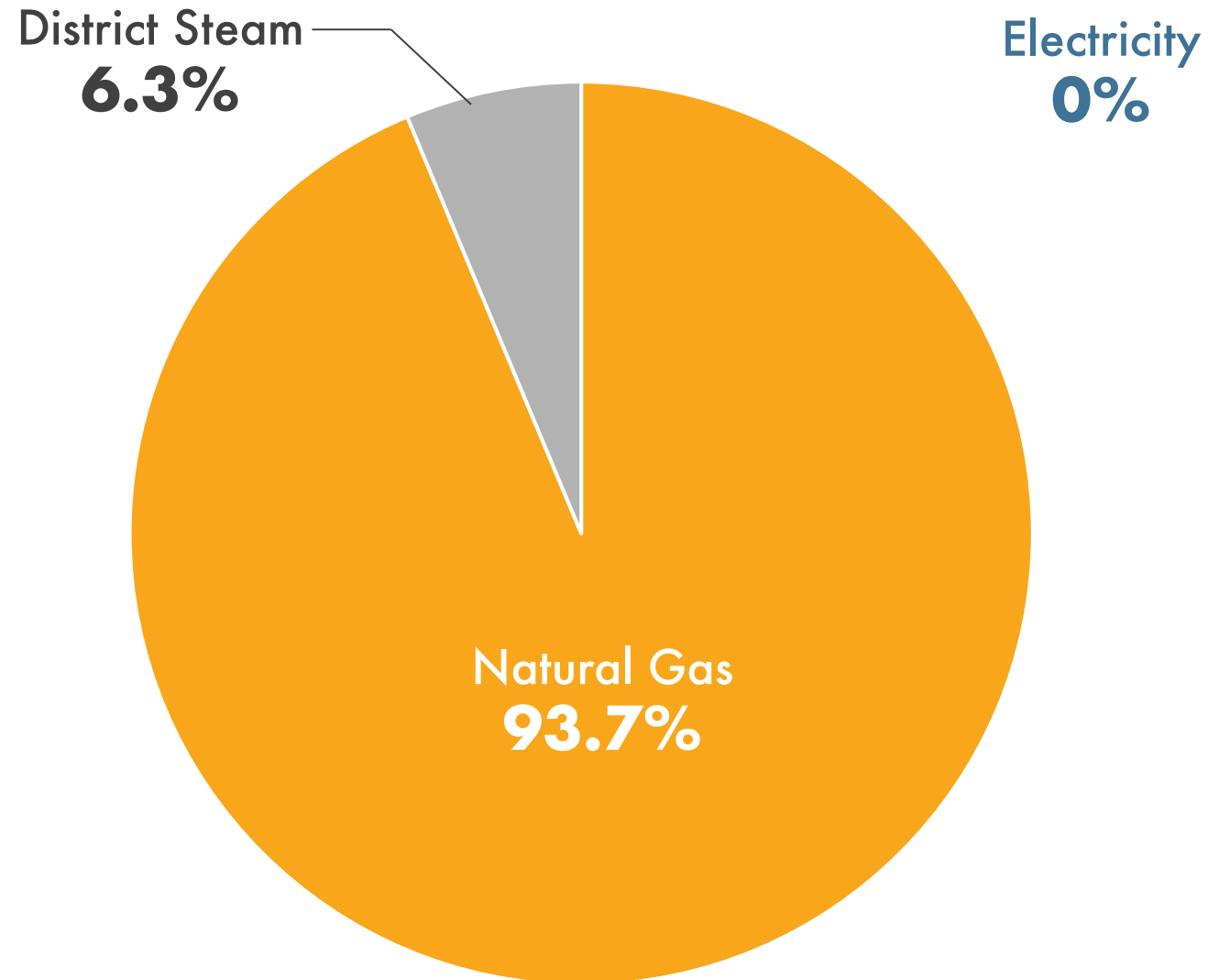
Electrifying San Francisco's Municipal Buildings



San Francisco's Emission Sources Today



Emission Sources - San Francisco Municipal Buildings





Global Climate Action Summit 2018





Net Zero Emissions Commitments



New Construction by 2030



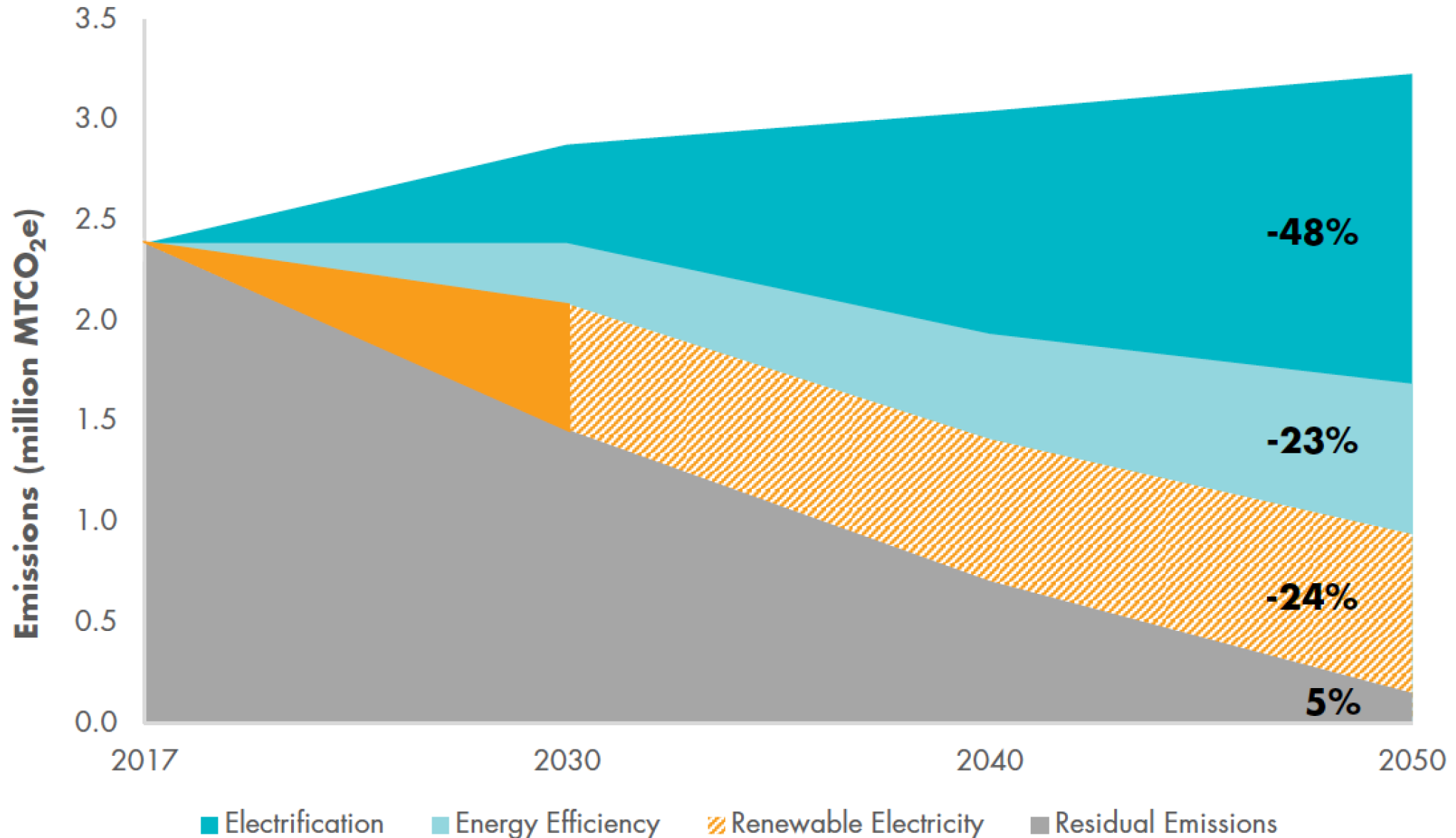
All Buildings by 2050

Declaring a Climate Emergency in San Francisco



Image: Mothers Out Front

Focus 2030: A Pathway to Net Zero Emissions



Ordinance: Electrification of Municipal Buildings



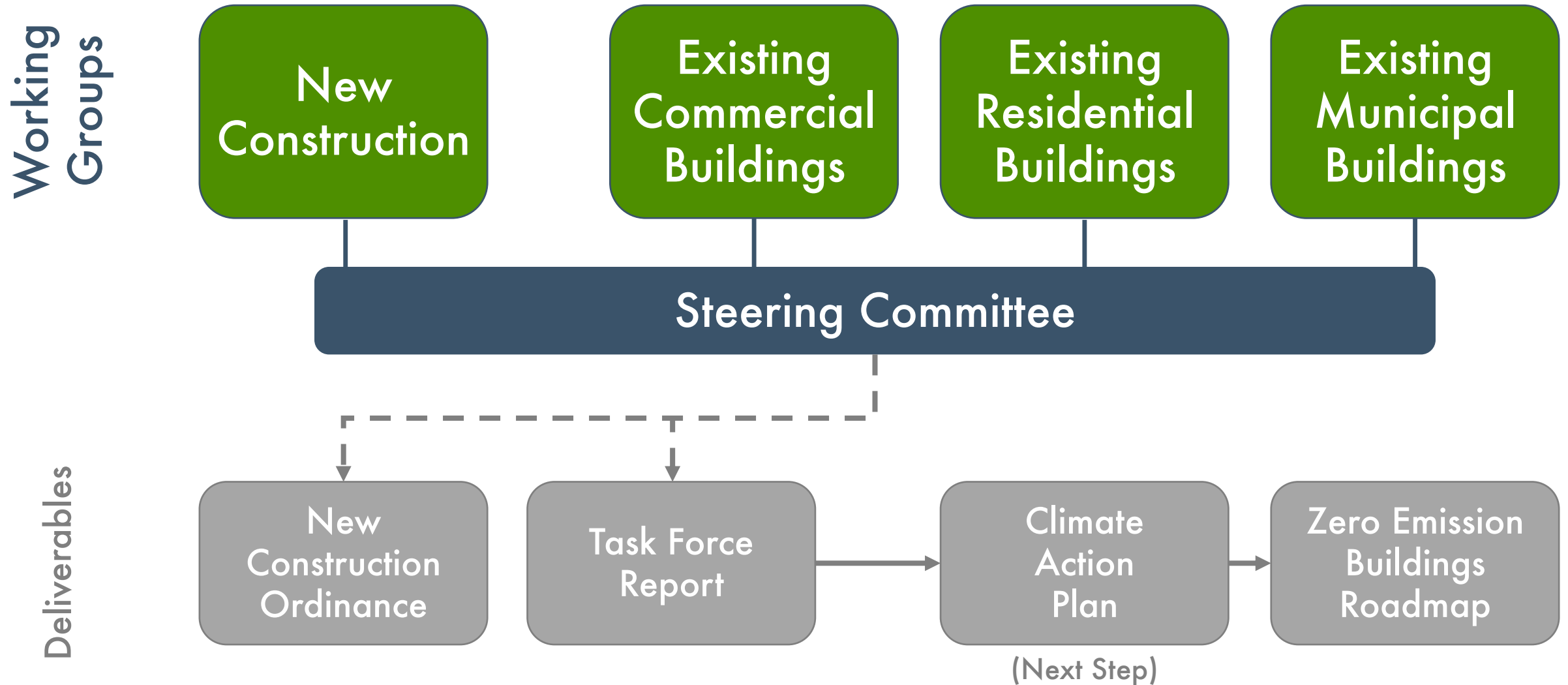
SFPUC & Public Works: Southeast Community Center (1550 Evans)

Ordinance: All-Electric Preferred in New Construction



Maceo May Apartments: Swords to Plowshares, Chinatown Community Development Center, Mithun, AEA

Mayor Breed's Zero Emission Building Taskforce



Inform: Climate Action Plan | Env Code, Ch 7



San Francisco Climate Action Strategy

Buildings

3 Energy Use in Buildings

San Francisco Energy Map shows all solar installations in San Francisco

Contribution to Greenhouse Emissions

(52%) of San Francisco's greenhouse gas emissions come from energy used in the city's residential and commercial buildings. Carbon dioxide is one of several pollutants that result from fossil fuels being burned to generate electricity and in homes and offices for heating. To reduce these emissions focus on using less energy, increasing energy efficiency, and energy recovery as well as diversifying the energy supply by replacing fossil fuels with renewable energy sources—microhydro, wind, solar, wave, and biomass.

Since 1990

Combined GHG emissions from electricity dropped from 3.5 million metric tons (MMT) in 1990 to 708,453 MMT in 2010. Shifts to cleaner energy in California have caused this downward trend.

10, electricity consumption in San Francisco increased 11%, roughly in line with the national average over the same period. This trend in electricity points to the emerging loads and consumption from servers and data centers. However, while consumption from data centers to generate electricity have increased, emissions resulting from electricity used in buildings decreased.

2013 Update

1990 ↑ 708,453 MMT CO₂e

2010 ↓

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San Francisco Environment Code

**CHAPTER 7:
GREEN BUILDING REQUIREMENTS FOR CITY BUILDINGS**

Print

Sec. 700. Findings and Purpose.
 Sec. 701. Definitions.
 Sec. 702. Municipal Green Building Task Force.
 Sec. 703. Duties of the Department of the Environment.
 Sec. 704. Duties of City Departments.
 Sec. 705. LEED Certification Requirements for Municipal Construction Projects.
 Sec. 706. Locally-Required Measures for Municipal Construction Projects.
 Sec. 707. Collection, Storage and Loading of Recyclable and Compostable Materials.
 Sec. 708. Construction and Demolition Debris Management.
 Sec. 709. Water Conservation Retrofit Requirements.
 Sec. 711. Indoor Environmental Quality.
 Sec. 712. Report to the Board of Supervisors.
 Sec. 713. Waivers.
 Sec. 714. Preemption.

*Editor's Note:
The title of this chapter (formerly "Resource Efficiency Requirements") was changed upon the incorporation of the extensive amendments made to the chapter by Ord. 204-11, at the discretion of the codifier and upon consultation with the office of the City Attorney.*

SEC. 700. FINDINGS AND PURPOSE.

The Board of Supervisors finds that:

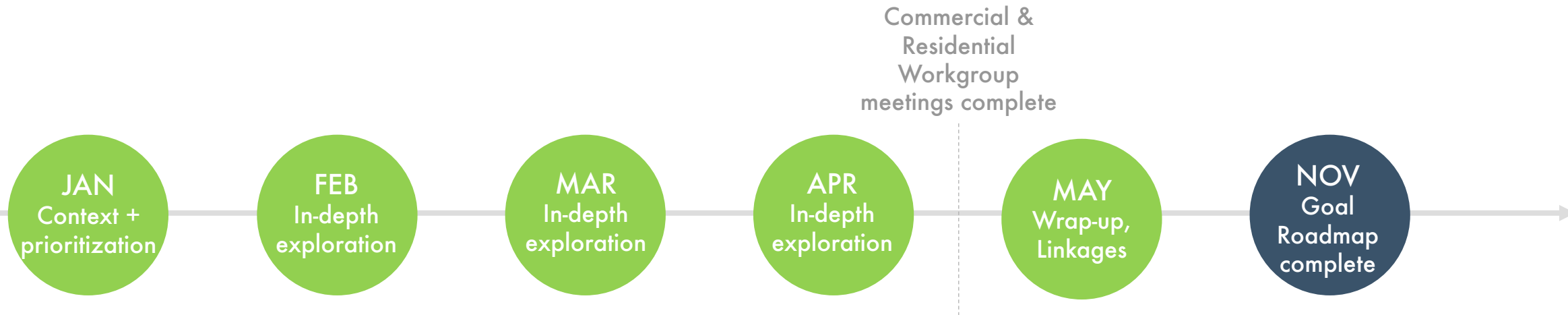
- Buildings are one of the distinguishing elements of human civilization. Traditional building design and construction practices have significant negative environmental impacts. In the United States, buildings consume 48% of all energy, 76% of all electricity, and generate 38% of all carbon (CO₂) emissions. In San Francisco, buildings consume 54% of all energy, 80% of all electricity, and generate 56% of all carbon emissions. Advanced green buildings can generate their own energy, minimize carbon emissions, produce and process their own water, emphasize reuse of buildings and materials, and provide healthy interior environments.
- The selection of sustainable design features and building materials is consistent with the City's Precautionary Principle Policy. This policy requires that the City consider a full range of alternatives in order to select products and procedures that minimize harm and maximize the protection of public health and natural resources.
- The United States Green Building Council (USGBC) is a non-profit organization committed to a prosperous and sustainable future for our nation through cost-efficient and energy-saving green buildings. LEED® is an internationally-recognized green building certification system, developed by the USGBC.
- Green buildings provide financial benefits while protecting human and environmental health. Total construction costs for buildings seeking LEED certification fall into the existing range of costs for buildings not seeking LEED certification. Green buildings, on average, result in savings of 20% of total construction costs over the first 20 years of operation.
- The California Energy Commission has established a goal that all new commercial construction in California will be Zero Net Energy by 2030, and 50% of existing commercial buildings will be retrofitted to Zero Net Energy by 2030.

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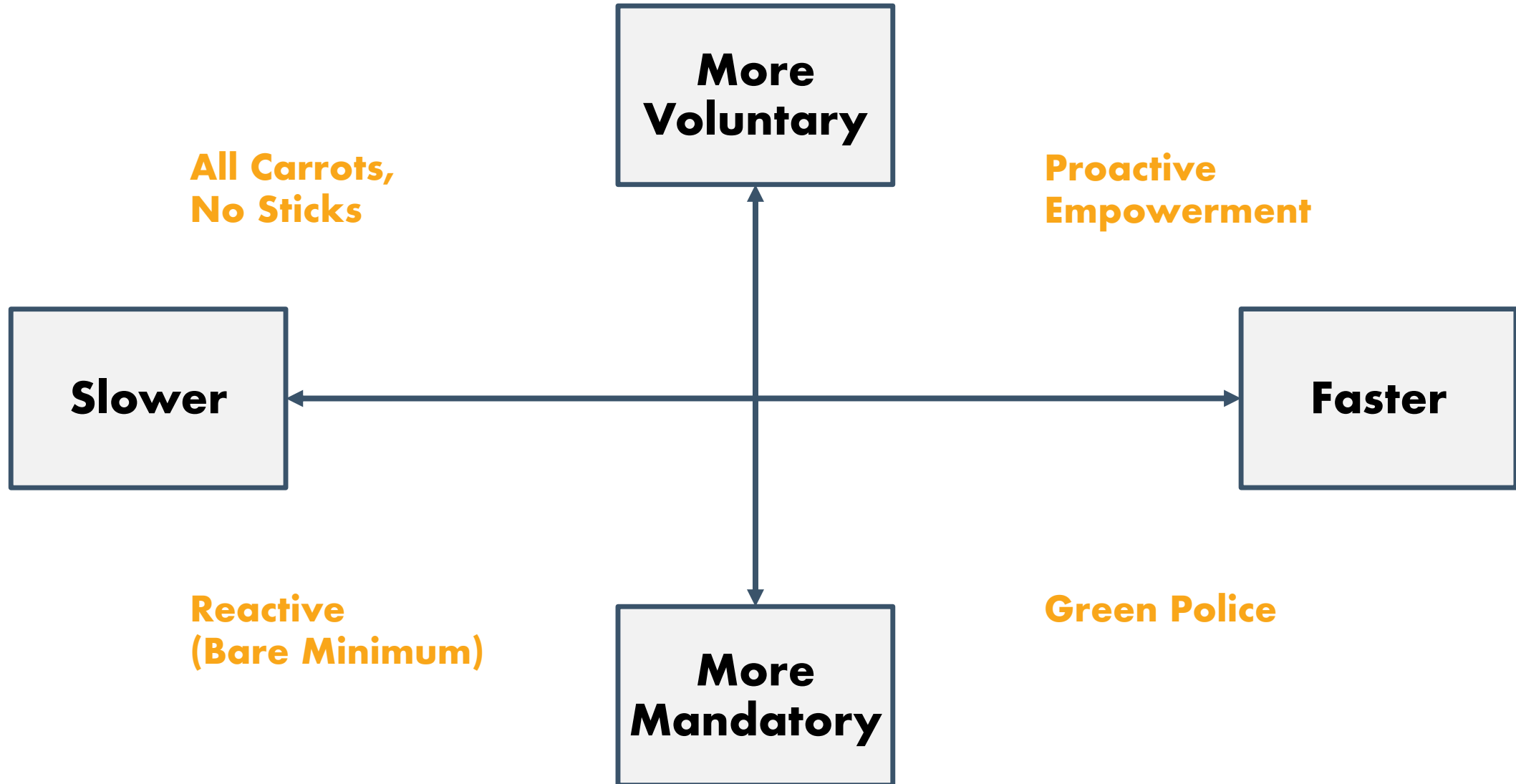
Participation and Original Schedule



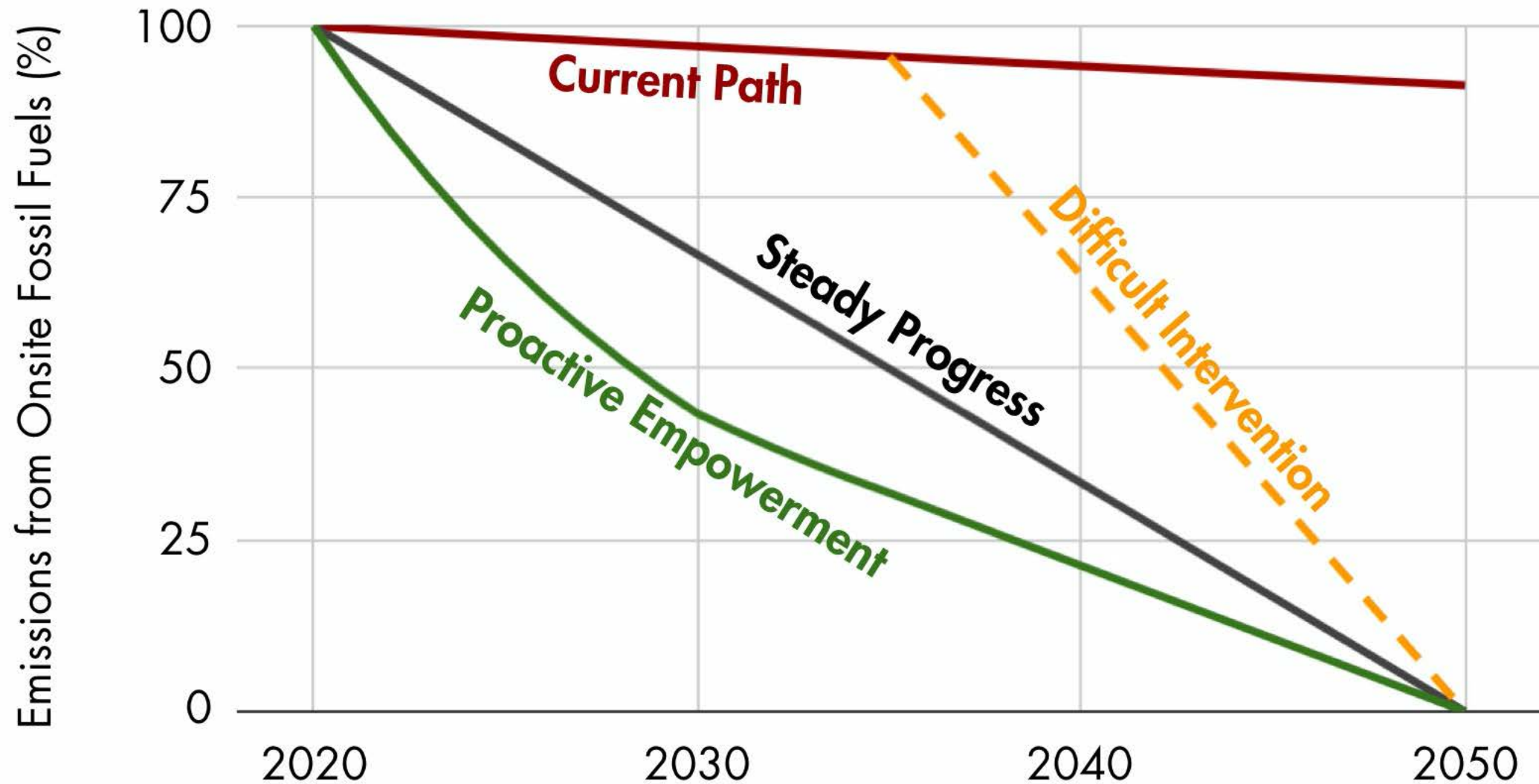
- 13 Departments/Divisions
- Cross-teaching, Invited guests
- Some outside facilitation



Context: A Range of Possible Futures



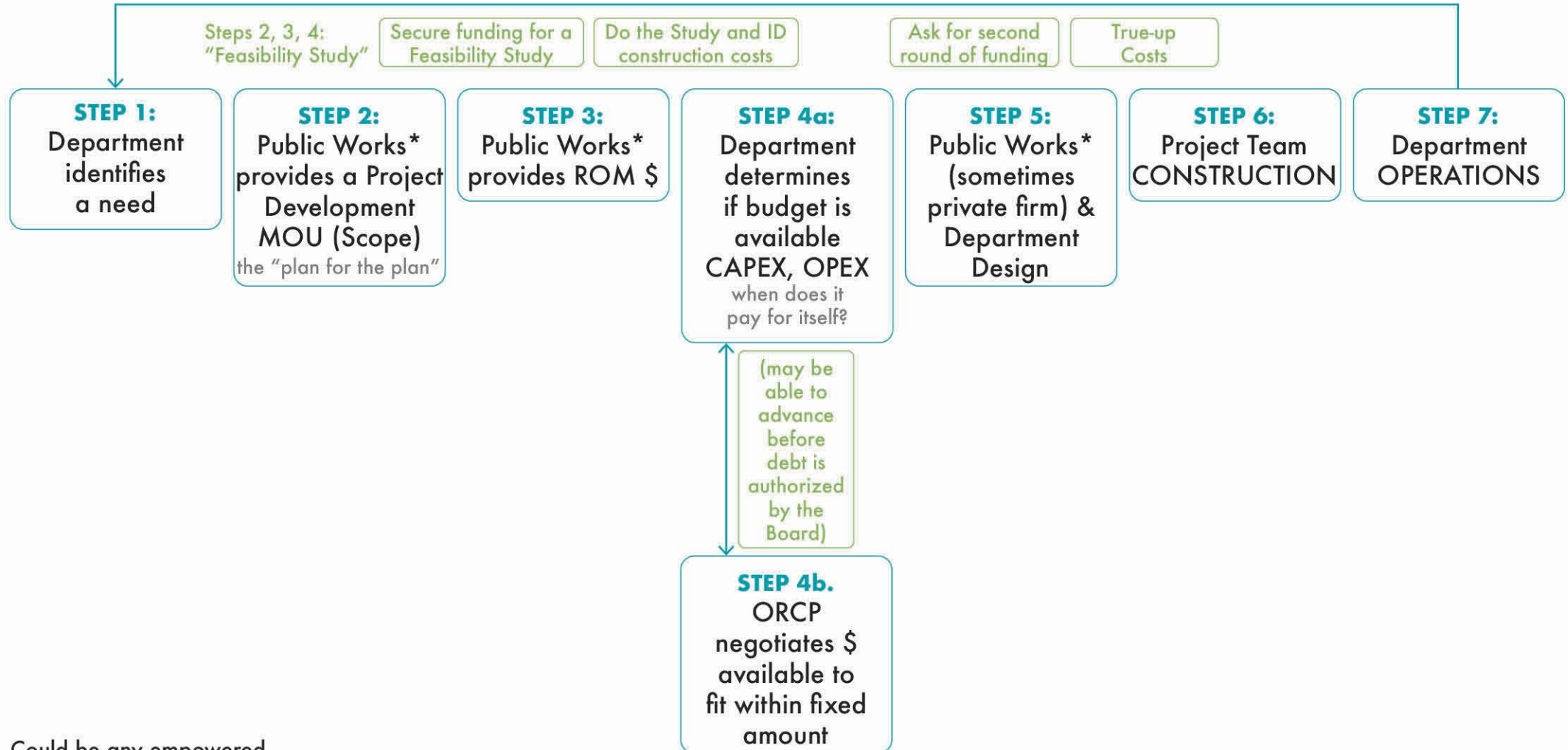
Context: Pathways to Zero Carbon...



Cataloguing and Evaluating Existing Buildings

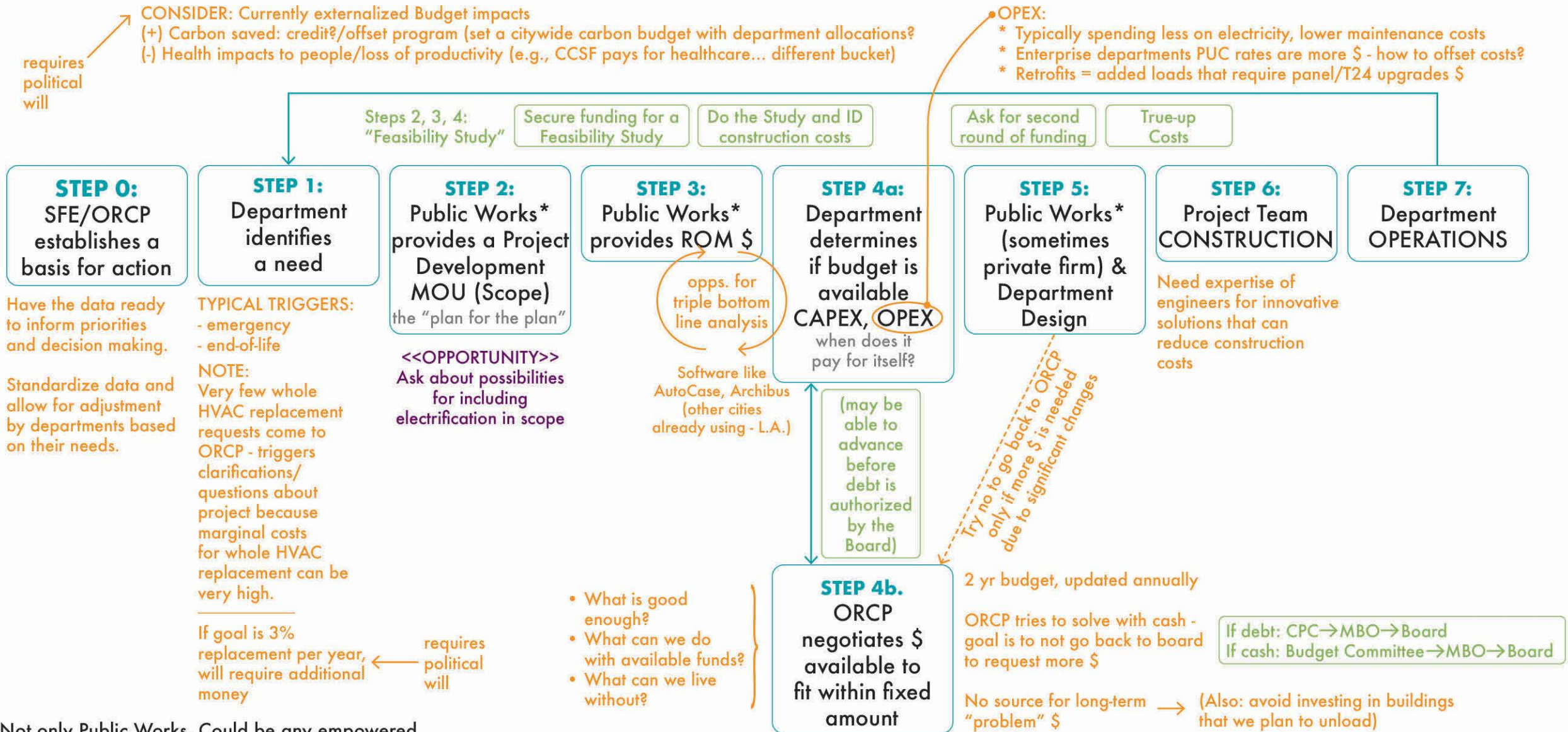


Deciding What To Do and When...



* Not only Public Works. Could be any empowered department per Admin Code Chapter 6

Deciding What To Do and When...



* Not only Public Works. Could be any empowered department per Admin Code Chapter 6

Request for Information (Pivot: Safer At Home Order)



ZEBT – Municipal Existing Buildings Workgroup
Request for Information

Please respond by Friday, May 01, 2020

5 QUESTIONS

Thank you for making the time to review the following items and provide insights to shape the Zero Emission Building Road Map. We will have a chance to discuss compiled feedback at the next Workgroup meeting, but please document here in as much detail as possible.

1. Priorities Summary

The table below is our first draft attempt to capture the key issues voiced at previous Municipal Existing Building Workgroup meetings. Does this reflect your position/needs? Please suggest revisions or additions.

DRAFT ZEBT - MUNICIPAL EXISTING BUILDING WORKGROUP DRAFT Priorities Summary		
Task Force Input	SFE Interpretation	*Fine Print
Survey the portfolio.	We need aggregated and easy access to the many data sources describing buildings and equipment.	Information is available, but it will be an effort to combine datasets, perform Facility Needs Assessments (FNAs), and fill in gaps.
Just start.	There's no wrong place to begin: Some buildings are simple, and others may be more complex.	We'll have to learn as we go, and aim to improve with every iteration.
Find the highest value.	Fiscal accountability includes addressing deferred maintenance and anticipating future uses for resilience.	An integrated planning approach considers technology availability and is not limited to like-for-like replacement of equipment.
Evolve the funding model.	There will always be financial constraints, and we need to find creative solutions.	Total Cost of Ownership or other metric is critical to capture avoided cost and deliver value to the taxpayer.
Prioritize a geographic approach.	We need a decarbonization masterplan.	SFPUC and PG&E must work together to understand the full impact on individual projects and the grid as a whole.

RESPONSE:

ZEBT – Municipal Existing Buildings Workgroup
Request for Information

Please respond by Friday, May 01, 2020

2. Empowerment/Education:

Who in your Department is driving outcomes for fuel-switching and what information would they benefit from? Include the spectrum, from "sending a signal" (talking points) to hands-on training for equipment specification and maintenance, etc.

RESPONSE (add rows as needed):

Role	Information type	Explanation

Additional recommendations for education?

RESPONSE:

3. Overarching linkages:

Do you have or plan to develop Department-specific goals, commitments, policies, or vision statements/activities that relate to reduction/elimination of building operational carbon?

RESPONSE (add rows as needed):

Item	Explanation	Available References (URL, publication, etc)

4. Barriers

What limitations (not already documented) are keeping your Department from fuel-switching existing buildings today?

RESPONSE:

5. Project phase cycles

Are there additional considerations for the Mapping Exercise: "Deciding what to do and when to do it"? ([See the updated diagram attached to Meeting Notes 3](#))

RESPONSE:

Anything else?

RESPONSE:

Empowerment/Education Suggestions



- Policy and Goal language
- Trainings
- Resource libraries and Document templates
- Coordination meetings

- Facilities Maintenance Roundtable
- Advisory Group
- Dedicated citywide fund for retrofits

Empowerment/Education, Applied



ROLE	TYPE
Leadership	<ul style="list-style-type: none">• Document/Presentation: Overall requirements, performance expectations, goal alignment
Asset Managers	<ul style="list-style-type: none">• Document: Specific implementation timelines• Training/Document: Modified weighting criteria/guidelines/metrics: carbon, resilience, health (vs first-, lifecycle costs)• Document: Additional funding sources (grants, incentives)
Engineers/ Designers	<ul style="list-style-type: none">• Training: Net benefits, equipment specifications, functionality, maintenance requirements• Library: successful installations, electrical load analyses• Templates: equipment specifications, Owner's Project Requirements, (Retro)Cx
Maintenance Staff	<ul style="list-style-type: none">• Training: changes to maintenance practices• Library: pre-vetted drop-in replacements
Utilities	<ul style="list-style-type: none">• Meetings: Coordination and agreement in scope and responsibility

Findings: Cross-Cutting Themes



Theme	Finding	* Fine Print
Clarity and Commitment	We must communicate about the future and eliminate barriers to action if we want to be effective.	All building owners and decision makers need to know what will be expected of them, without ambiguity or City-created barriers.
Time and Timing	Anticipation, planning, and resourcing are required.	Missed opportunities must be avoided. Support for action is required, in sync with real estate cycles.
Value and Values	Electrification brings health, resilience, and decarbonization benefits.	Processes, tools, and metrics must guide decision making to support racial equity and shared benefits for all.
49 Square Miles	We need a decarbonization masterplan that includes every neighborhood.	Equitable decarbonization, modernizing the grid, attaining seismic benefits, and lowering costs all require a coordinated plan.

Findings: Municipal Working Group



Input

Know the portfolio.

Finding

We need easy access to integrated data sources describing municipal buildings.

* Fine Print

Information is available, but it will be an effort to integrate databases, fill in gaps, and perform assessments. Selection and deployment of a shared platform or common schema will be a significant lift.

Findings: Municipal Working Group



Input

Finding

* Fine Print

Know the portfolio.

We need easy access to integrated data sources describing municipal buildings.

Information is available, but it will be an effort to integrate databases, fill in gaps, and perform assessments. Selection and deployment of a shared platform or common schema will be a significant lift.

Be strategic and opportunistic.

Align departments to capture easy wins, address complex situations, and fulfill emissions commitments.

With proper guidance, evaluative frameworks, and feedback loops, the City can learn continually and improve with every iteration.

Findings: Municipal Working Group



Input	Finding	* Fine Print
Know the portfolio.	We need easy access to integrated data sources describing municipal buildings.	Information is available, but it will be an effort to integrate databases, fill in gaps, and perform assessments. Selection and deployment of a shared platform or common schema will be a significant lift.
Be strategic and opportunistic.	Align departments to capture easy wins, address complex situations, and fulfill emissions commitments.	With proper guidance, evaluative frameworks, and feedback loops, the City can learn continually and improve with every iteration.
Seek the highest value, including co-benefits.	An integrated planning approach is not just about operations, but excellence.	The economic, health, and resilience impacts of public investments are as important as technology selection.

Findings: Municipal Working Group



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Evolve the funding model.	There will always be financial constraints, and we need to find creative solutions.	Total Cost of Ownership is critical to capturing avoided cost and delivering value to the taxpayer.

Findings: Municipal Working Group



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Seek the highest value, including co-benefits.	An integrated planning approach is not just about operations, but excellence.	The economic, health, and resilience impacts of public investments are as important as technology selection.
Evolve the funding model.	There will always be financial constraints, and we need to find creative solutions.	Total Cost of Ownership is critical to capturing avoided cost and delivering value to the taxpayer.
Pursue a geographic approach.	Leverage development patterns and relationships with private sector partners in decarbonization masterplanning.	The City needs to leverage development patterns and relationships with private sector partners. Engagement with utilities early and often will be critical.

Fuel-Switching Our Existing Building Stock



SF Public Library & Public Works: Mission Branch Library (300 Bartlett)

Thank You!



<https://sfenvironment.org/zebtaskforce>

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SF Environment

Our home. Our city. Our planet.

A Department of the City and County of San Francisco

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