Zero Net Carbon Building Zoning Renewable Energy Procurement TAG Meeting #1 – January 13, 2021

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Zoom Meeting Guidance

The BPDA will record this meeting and post it on BPDA's Zero Net Carbon Building Zoning webpage. The recording will include the presentations, discussions and a transcript of Q&A / Chat comments.

It is possible that participants may be recording this meeting as well.
If you prefer not to be recorded during the meeting, please turn off your microphone and camera.

Zoom Meeting Guidance

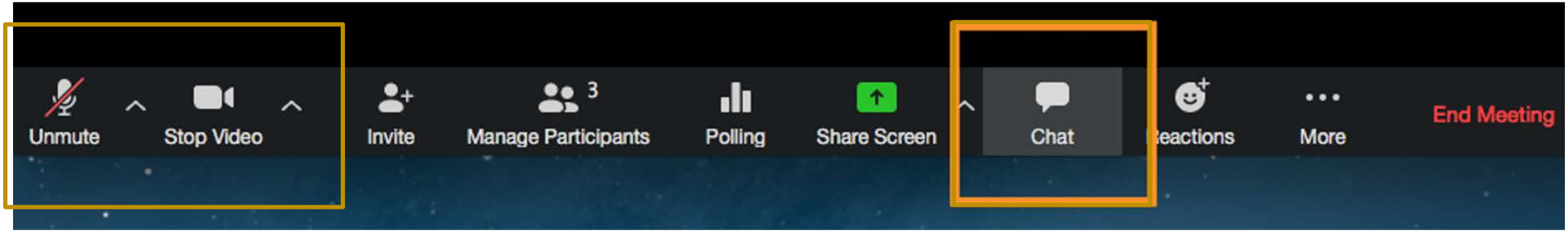
- Help us ensure that this conversation is a pleasant experience for all.
- Please mute your mics during the presentation to avoid background noise.
- It's great to see you! Participant video can be on during the meeting.
- **Use the Chat** feature for questions and comments during the presentation.
- Use the Raise Hand feature during the discussion segment.
- Please be respectful of each other's time.

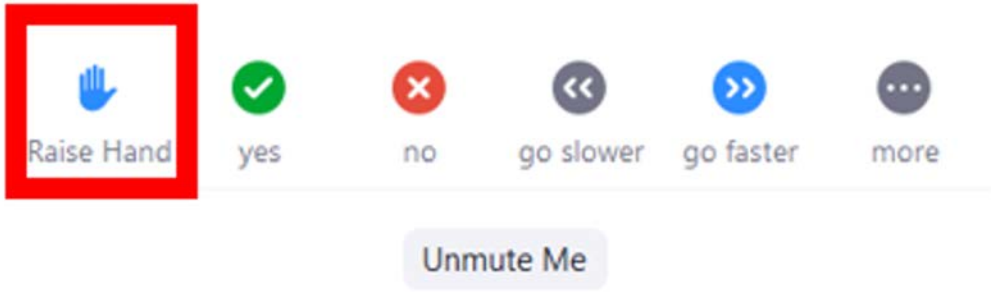
- As always please feel free to reach out to me directly!
  John Dalzell, AIA, LEED Fellow at John.Dalzell@Boston.gov

Zoom Tips

Your controls should be available at the bottom of the screen.

Clicking on these symbols activates different features:





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COVID-19 Resources

Stay up-to-date with COVID-19 related announcements, City of Boston reopening plans, and resources for you and your community at:

boston.gov/coronavirus

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Renewable Energy Procurement

Vincent Martinez, Chief Operation Officer

Architecture 2030

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Charles Eley, Senior Fellow

Architecture 2030

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ZNC BUILDING ZONING UPDATE

Boston Carbon Neutral 2050 – Climate Action Plan

"Strengthen Article 37 Green Building Zoning requirements to a zero net carbon standard"

Policy Framework: *Zero = Bldg Emissions – On-site and Procured Renewable Energy*

Low Carbon Buildings Establish Emission Targets and Pathways

On-site Renewable Energy

On-site Energy Generation Standard

Renewable Energy Procurement ***(this TAG)***

Determine Options & Reporting

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RE Procurement TAG Process

TAG Meetings:

- **Meeting 1 (today) - Framework and Pathways**
- **Meeting 2 – Deep Dive on Procurement Options & Minimum Requirements**
- **Meeting 3 – Deep Dive on Procurement Factors & Weighting Criteria**
- **Meeting 4 – Finalizing Recommendations**

Today's Meeting Outcomes:

- **Recommendations for Procurement Options**
- **Recommendations for natural gas emissions offsets**

Renewable Energy Procurement TAG

January 13th, 2021 Meeting Agenda

- Introduction (Expertise on the TAG)
- Procurement Options
  - Most Relevant
  - Minimum Requirements
  - Classification Criteria and Risks
- Renewable Energy to Offset Gas Emissions
- BERDO Interactions
- Other Community Concerns (e.g. Local Markets)
- Share reports, precedents and other resources

Member Introductions

- **Vincent Martinez, Architecture 2030, COO**
- **Charles Eley, Architecture 2030, Senior Fellow**
- **Erin McDade, Architecture 2030, Senior Program Director**
- **Dennis Carlberg, Boston University**
- Scott Johnstone, VHB
- **Scott McBurney, Vicinity Energy**
- **Seth Federspiel, City of Cambridge**
- **Cameron Peterson, MAPC**
- **Yve Torrie, A Better City**
- **Debra Perry, Cadmus**
- **Joelle Jahn, WSP Engineering**
- Ben Myers, Boston Property
- **Patrick Haswell, Vicinity Energy**

City Staff Introductions

- Aidan Smith
- Alison Brizius
- **Anna Demina**
- **Benjamin Silverman**
- **Chris Busch**
- Christopher Kramer
- **David Musselman**
- **Joseph LaRusso**
- Katherine Eshel
- **Kathleen Pedersen**
- **Manuel Esquivel**
- **Maura Zlody**
- **Richard McGuinness**

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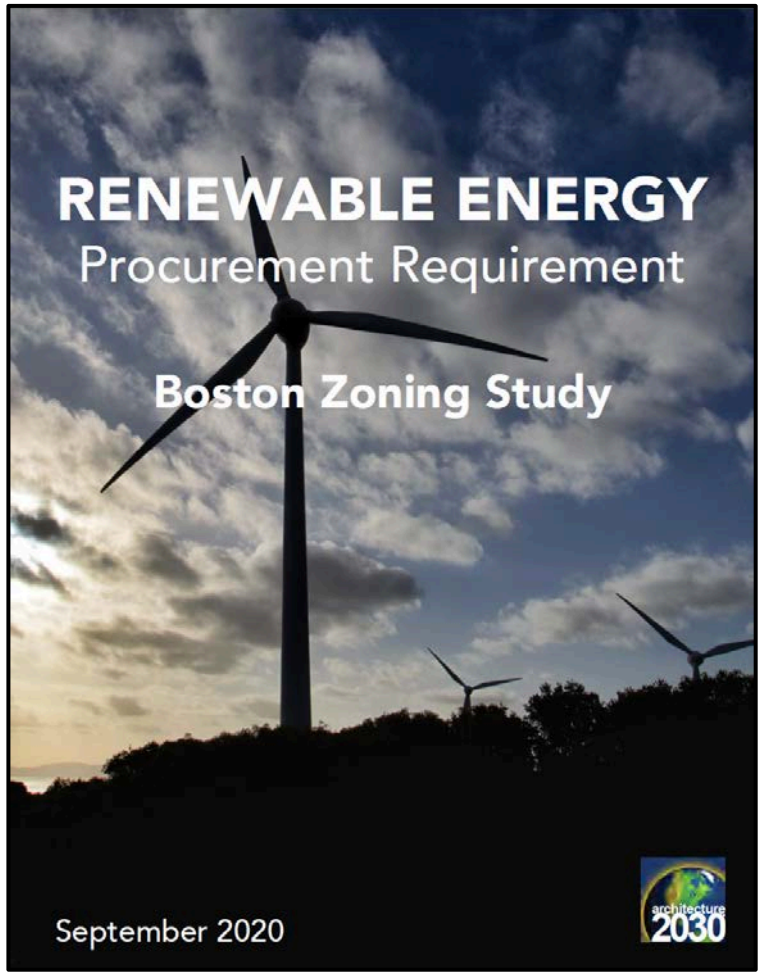
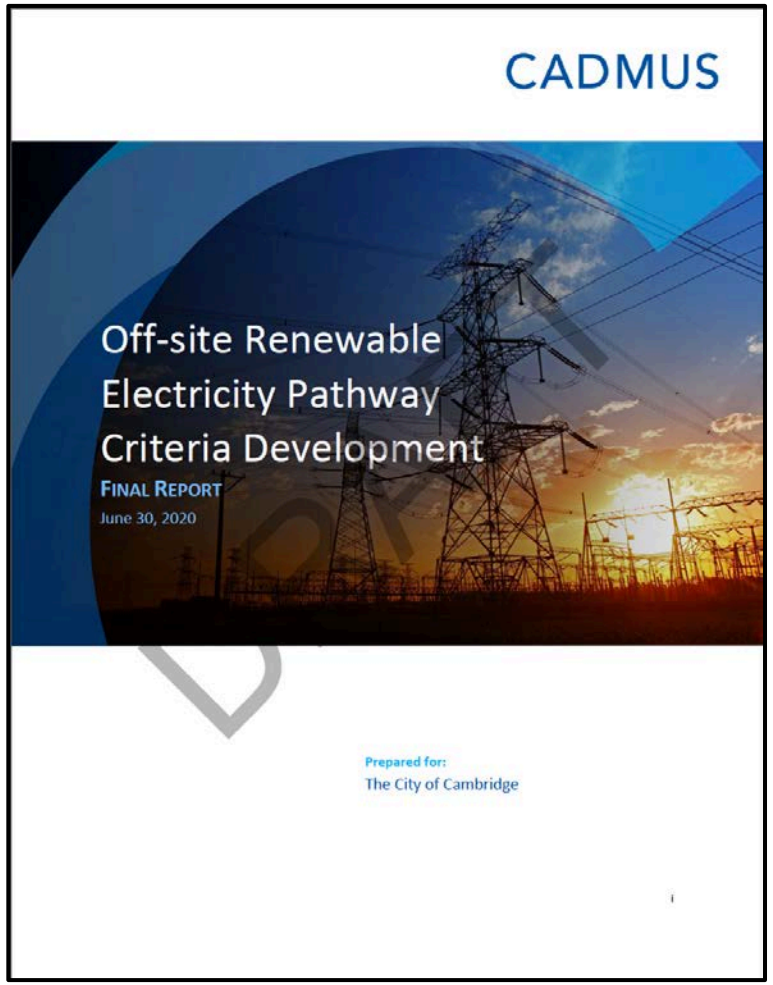
Renewable Energy Procurement

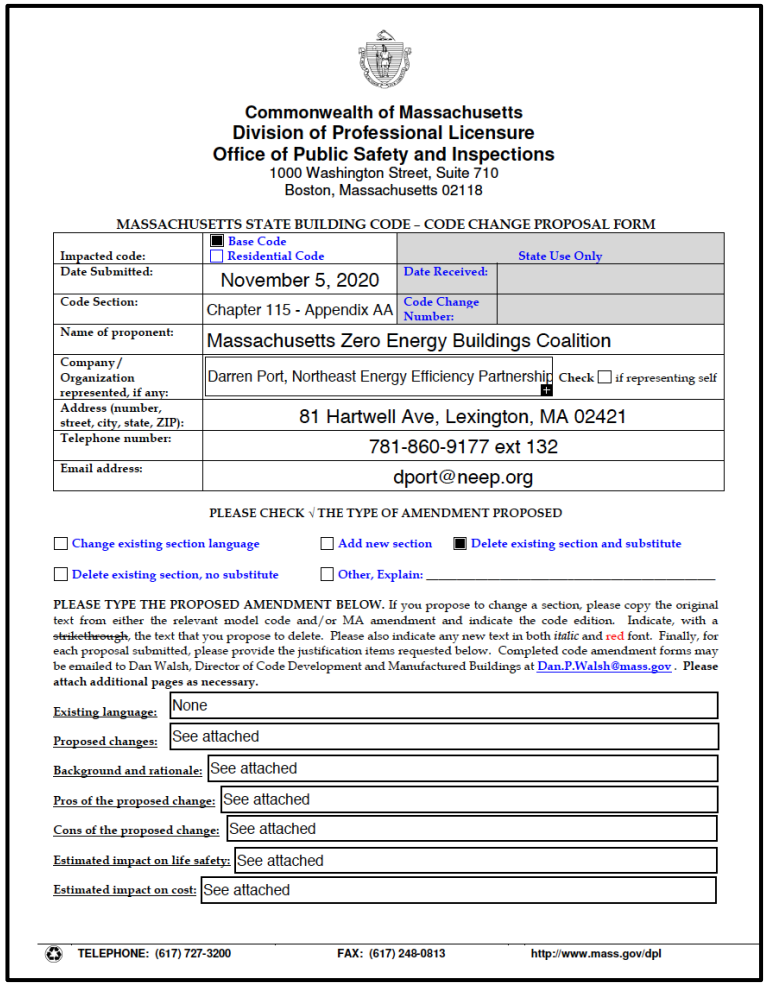
The purchasing of energy and/or its environmental attributes from off-site renewable energy systems.

“Off-site” renewable energy is anything that is not considered “on-site”.

Foundational Documents







Commonwealth of Massachusetts
Division of Professional Licensure
Office of Public Safety and Inspections
1000 Washington Street, Suite 710
Boston, Massachusetts 02118

MASSACHUSETTS STATE BUILDING CODE – CODE CHANGE PROPOSAL FORM

Impacted code:	■ Base Code ☐ Residential Code	State Use Only	
Date Submitted:	November 5, 2020	Date Received:	
Code Section:	Chapter 115 - Appendix AA	Code Change Number:	
Name of proponent:	Massachusetts Zero Energy Buildings Coalition		
Company / Organization represented, if any:	Darren Port, Northeast Energy Efficiency Partnership	Check ☐ if representing self	
Address (number, street, city, state, ZIP):	81 Hartwell Ave, Lexington, MA 02421		
Telephone number:	781-860-9177 ext 132		
Email address:	dport@neep.org		

PLEASE CHECK √ THE TYPE OF AMENDMENT PROPOSED

☐ Change existing section language ☐ Add new section ■ Delete existing section and substitute

☐ Delete existing section, no substitute ☐ Other, Explain: _____

PLEASE TYPE THE PROPOSED AMENDMENT BELOW. If you propose to change a section, please copy the original text from either the relevant model code and/or MA amendment and indicate the code edition. Indicate, with a ~~strikethrough~~, the text that you propose to delete. Please also indicate any new text in both *italic* and red font. Finally, for each proposal submitted, please provide the justification items requested below. Completed code amendment forms may be emailed to Dan Walsh, Director of Code Development and Manufactured Buildings at Dan.P.Walsh@mass.gov. **Please attach additional pages as necessary.**

Existing language:	None
Proposed changes:	See attached
Background and rationale:	See attached
Pros of the proposed change:	See attached
Cons of the proposed change:	See attached
Estimated impact on life safety:	See attached
Estimated impact on cost:	See attached

TELEPHONE: (617) 727-3200 FAX: (617) 248-0813 http://www.mass.gov/dpl

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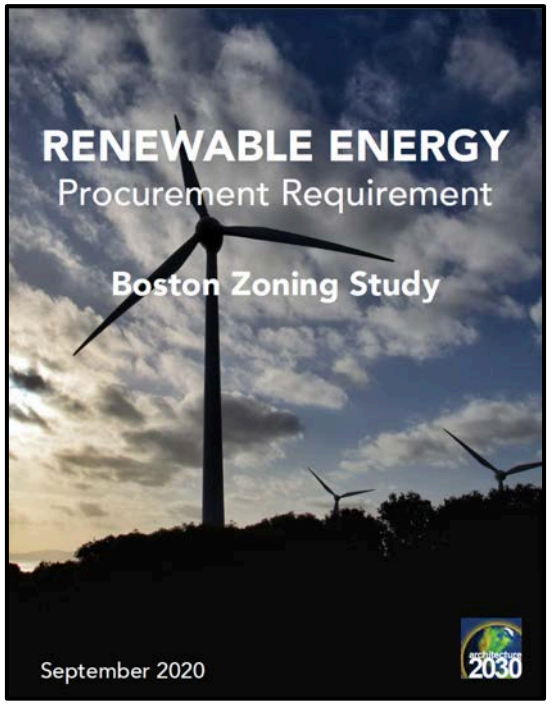
Renewable Energy Procurement

- Direct Ownership / Self-owned, off-site project
- Community Renewables
- Power Purchase Agreements (PPAs)
- Virtual Power Purchase Agreements (VPPAs)
- Utility Renewable Energy Contract / Direct Access to the Wholesale Markets
- Green Retail Tariffs / Green Pricing / Green Municipal Aggregation
- Renewable Energy Investment Fund
- Unbundled Renewable Energy Certificates / Credits (RECs)

Procurement Option Variations

- Class of Generator
- Unbundled RECs
- Electricity Credit



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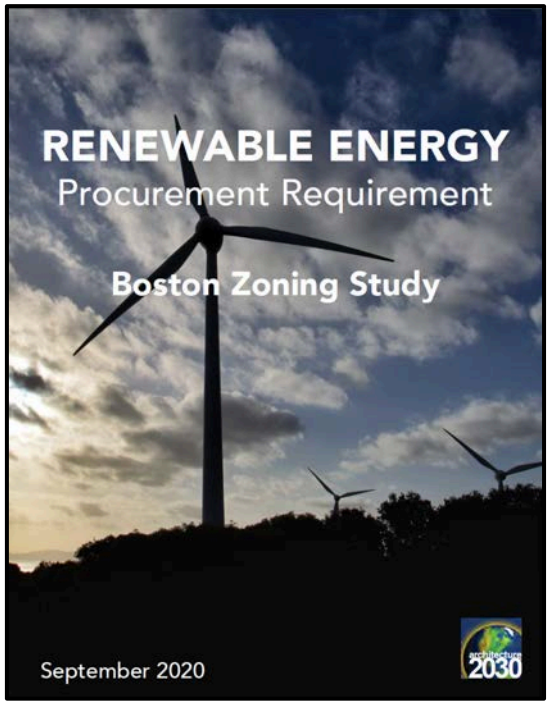
Procurement Option Variations

Table 10 – Procurement Options and Variations for Boston

Procurement Method	*Variation*	*Notes*
On-Site	n.a.	Basis of comparison
Self-Owned	n.a.	Located in community with electricity and RECs
Community Solar	Up-Front Payment	Cost of participation is paid in advance
	Subscription	Risk of loss of durability
Virtual PPA	MA Class I Generator	DOER approved generator in ISO New England region
	Out of Region	Probably wind from Texas or Great Plains
Unbundled RECs	MA Class I	DOER approved generator in ISO New England region
	Other	Probably wind from Texas or Great Plains
Green Pricing (RECs)	MA Class I	Backed by Massachusetts Class I RECs
	Other	Typically backed by wind RECs from Texas or Great Plains
Utility Contract	Bilateral Agreement	Custom long-term contract
	Special Green Tariff	Standard long-term contract
REIF	Local PV System	PV system is constructed in community
	vPPA Investment	Third-parties add capacity through a vPPA or other financial instruments
	Unbundled RECs	Money is used to buy unbundled RECs on behalf of program participants



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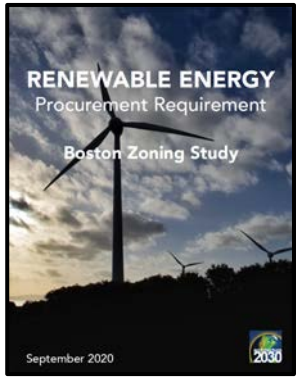
Evaluation Criteria / Guiding Principles



- Impact / Additionality
- Durability /Long-Term Commitment
- Locality / Local Impact
- Assignment to Building
- Electricity Credit
- Incremental Acquisition
- Grid Management
- Environmental Impact
- Inspirational/Educational Value
- Permanent Financing
- Renewable Generation Sources
- Equity
- Public Health

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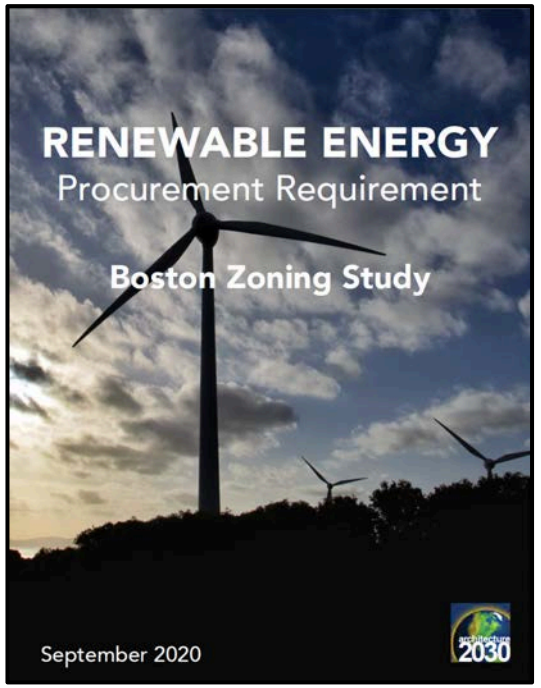
Minimum Requirements

- Generation Source
- Durability
- Renewable Energy Certificates
- **DISCUSSION:**
  - **Additionality**
    - **Limit to New England ISO? Allow to go outside?**
    - **Local impact is priority (prioritize new local renewable assets)**
      - **could be challenge for national/international companies**
    - **Consider link between Additionality and Durability: are these separate criteria or different ways of getting at same goal?**
  - **Equity + Public Health**
    - **Critical city and community priority**
  - **Actual GHG reduction impact**
    - **What fuel are the (new) renewables actually displacing from the grid?**
    - **GHG impact may be better w/ non-local renewables, but that does not have a local GHG impact**
  - **These are guiding principles – what are the criteria we establish to measure these?**



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Minimum Requirements

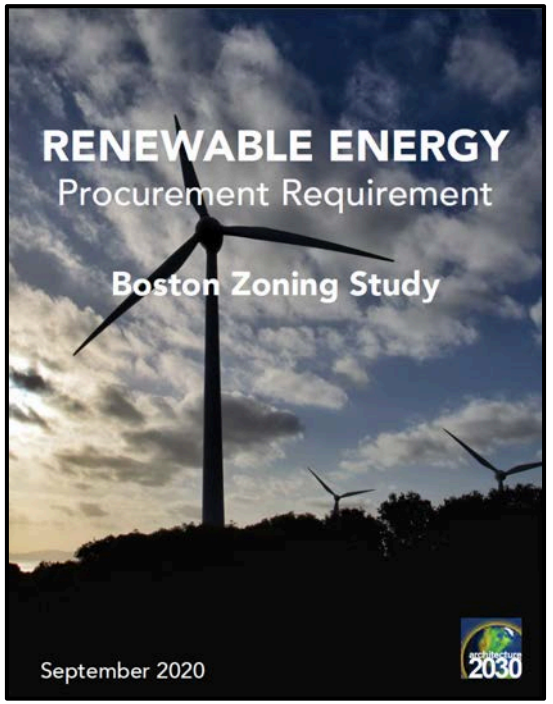
- Generation Source

The renewable energy generating source shall be photovoltaic systems, solar thermal power plants, geothermal power plants, wind turbines, or other Class I renewable energy generators approved by the Massachusetts DOER.

Language from proposed MA EZ Code: MA Class I (Inclusive of the Following Types)

a) Solar photovoltaic
b) Solar thermal electric
c) Wind energy
d) Small hydropower
e) Marine or hydrokinetic energy
f) Geothermal energy (without vapor compression cycle)

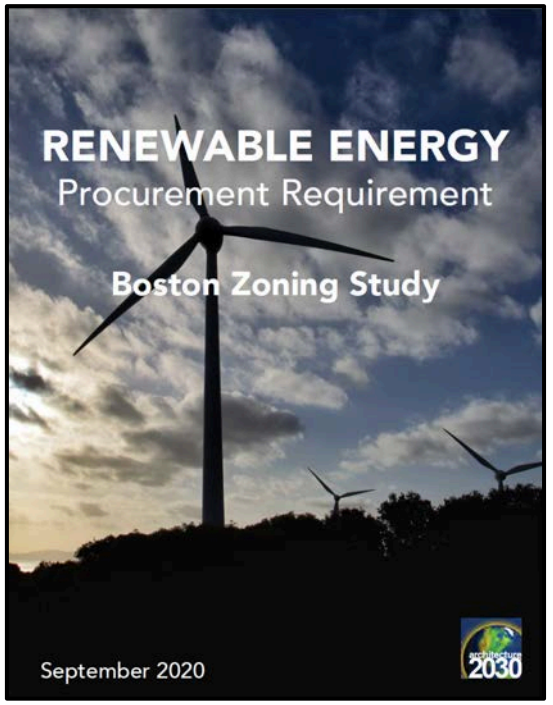
Exception: For existing district energy plants that serve thermal energy to multiple buildings, all MA Class I renewable energy sources are acceptable, including: landfill methane, anaerobic digester gas, and eligible biomass fuel.



Minimum Requirements

- Durability

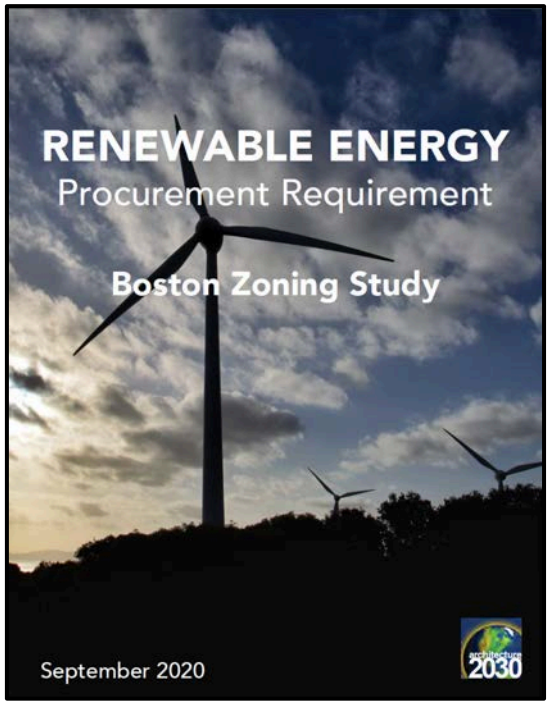
The building owner shall sign a legally binding contract to procure qualifying off-site renewable energy for a period of 15 years and the contract shall be structured to survive a partial or full transfer of ownership of the property.



Minimum Requirements

- Renewable Energy Certificates.

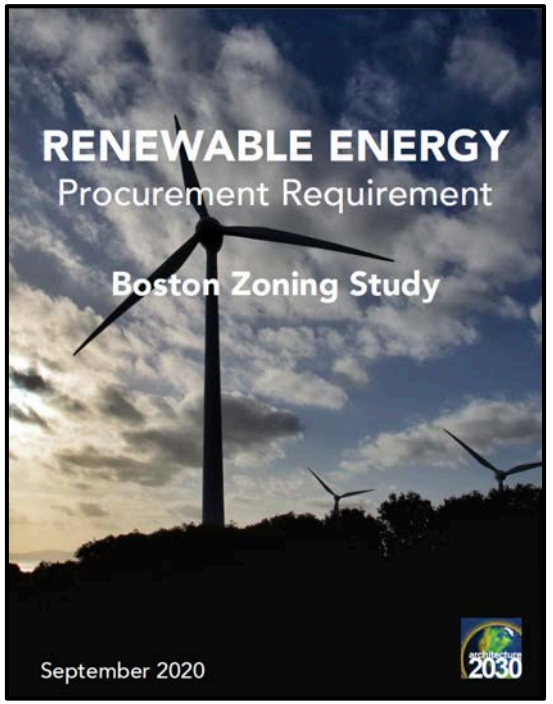
RECs and other environmental attributes associated with the renewable energy shall be assigned to the building project for the duration of the contract.



Minimum Requirements

Table 12 – Minimum Requirements for Off-Site Procurement Options

	Minimum Requirements		
Procurement Option	*Generation Source*	*Durability*	*Renewable Energy Certificates*
On-Site (Off-site options are compared to this)	Will be solar in almost all cases.	The system is on-site but can be self-owned or installed through a solar lease or direct PPA.	Yes. But some owners have been known to sell the RECs and direct PPA contracts often assign the RECs to the seller.
Self-Owned (viable for Boston and supported by virtual net-metering)	Will typically be wind or solar.	Forward contract for RECs can provide durability in the event that the system is sold separately from the complying building.	Yes. Should not be a problem.
Community Solar (no known programs in Boston)	Usually solar but could be another type of generator.	It's easy to opt out of most programs.	No. Most community solar programs usually do not provide RECs to the participant
Virtual PPA (limited to large credit-worthy organizations)	Wind and solar are the most common, but other generator types are possible.	Not a problem. The renewable energy developer requires a long-term commitment.	Yes. This is the essence of the deal.
Unbundled RECs (Massachusetts Class I RECs are preferred)	Can be anything, but mostly wind with some solar.	Forward contracts can be used to establish a long-term commitment.	Yes. RECs are the asset being purchased.
Green Tariffs (includes competitive suppliers and CCAs)	Most are backed by wind RECs from Texas or the Great Plains.	The longest typical contract is 36 months – it's easy to opt out.	Yes. Most green tariffs in Massachusetts are REC buying programs.
Utility Renewable Contracts (none in Massachusetts)	Wind and solar are most typical.	Contracts are for the long-term.	Yes. Customers contract for RECs and energy.
Renewable Energy Investment Fund (REIF) (three investment options)	REIF management establishes criteria	Contribution can be an up-front payment or a subscription	Yes. Should not be a problem, but there are no precedents.



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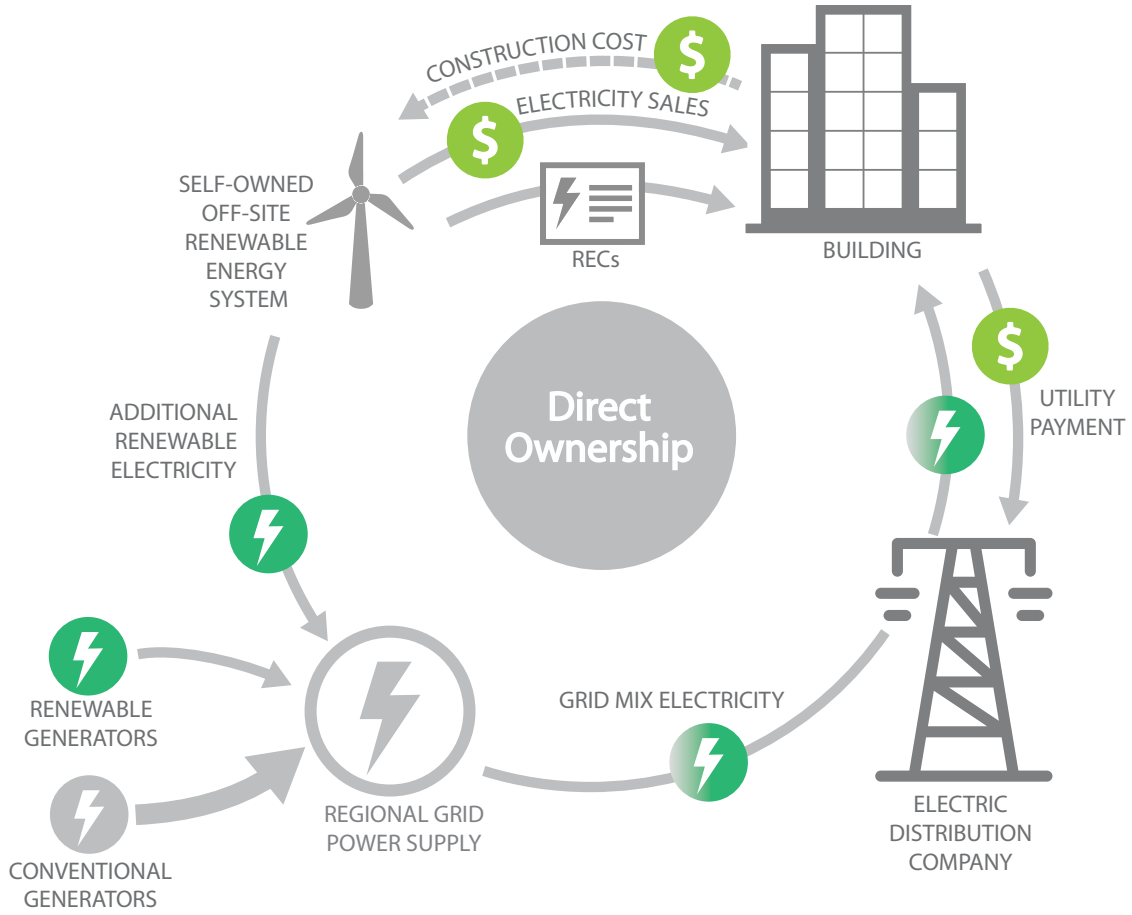
Direct Ownership / Self-owned, off-site project



DISCUSSION:

Challenges:

- The RECs and environmental benefits need to be allocated to specific buildings in a fair and equitable manner.
- A forward contract is needed to assure that the RECs will continue to accrue to the specific buildings in the event that the renewable energy system is sold to a third party.
-

Opportunities:

-

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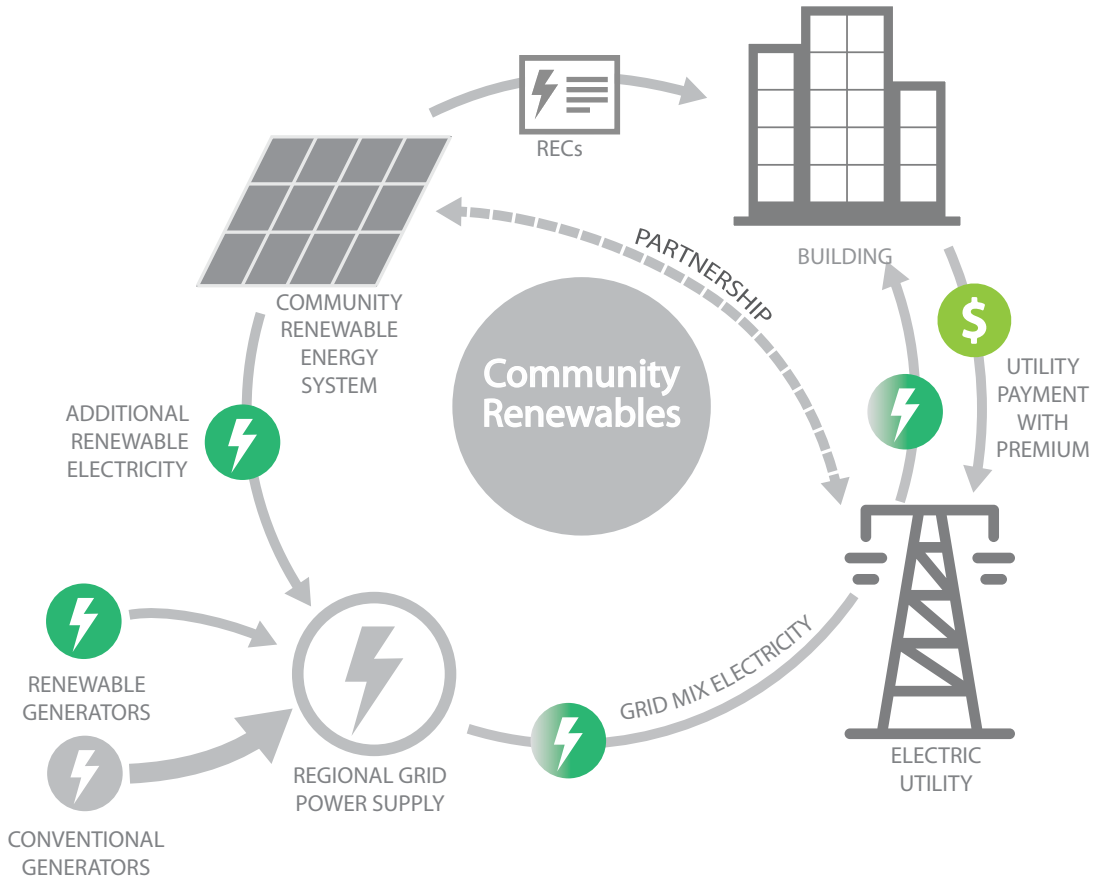
Community Renewables



DISCUSSION:

Challenges:

- Purchase cannot exceed building electricity use.
- RECs are often not provided to the building owner.
  - How do we address this?
- It's easy to opt out of the commitment.
- Durability requires upfront payment, but this is an equity issue

Opportunities:

- Required compliance can result in anchor investor
- Sharing RECs: one large investor can purchase more RECs than they need and share those out
- Can there be innovative solutions to address both equity and durability requirements?
- Talk to community renewable developers to learn more

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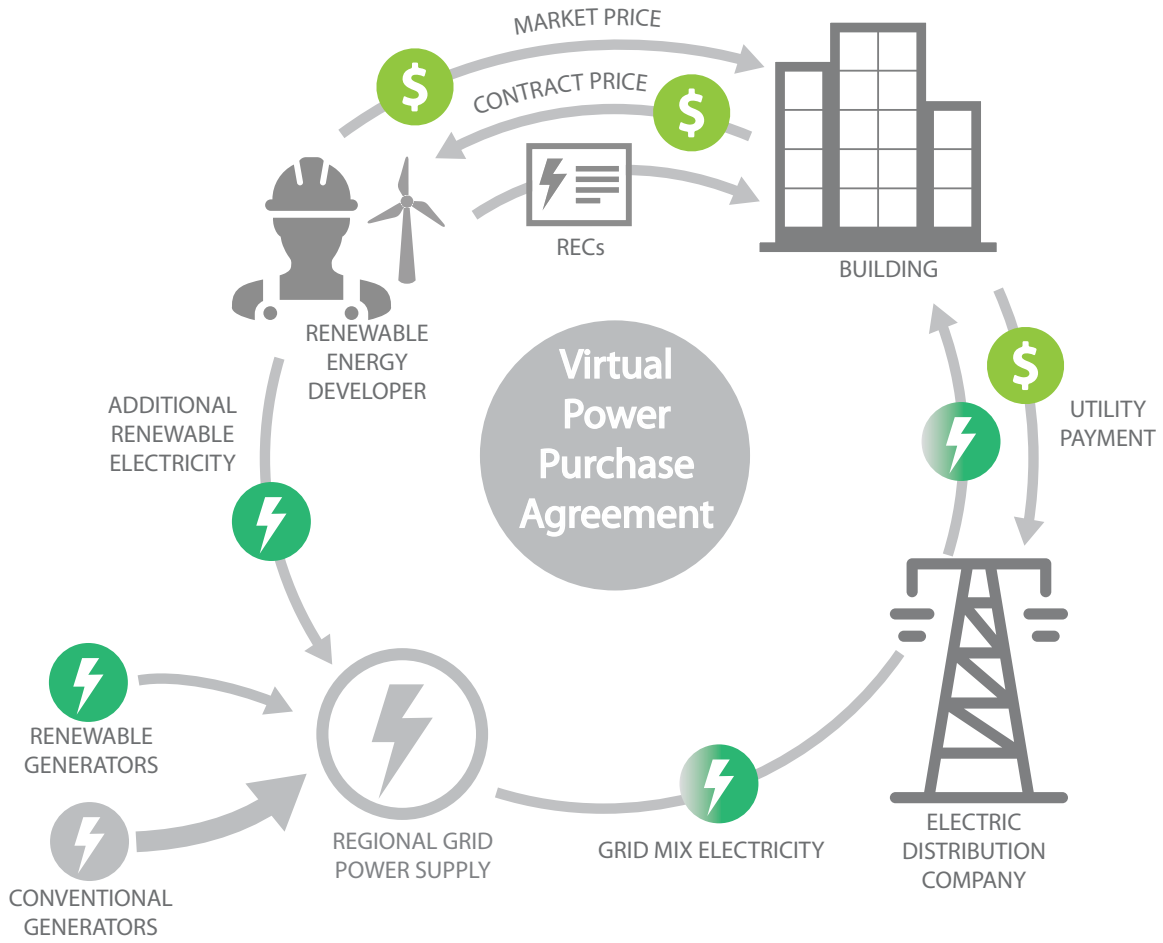
Power Purchase Agreements (PPA / VPPA)



DISCUSSION:

Challenges:

- Available only to large customers with an excellent credit rating.
- Large purchases are required, generally 5 MW for solar and 10 MW for wind.
- Renewable energy generators are sometimes located far from the building load they are offsetting.
- The RECs and environmental benefits need to be allocated to specific buildings in a fair and equitable manner.
- Do renewables need to be new, in the context of when an e.g. 15 year contract expires – do those RECs no longer count?

Opportunities:

- See notes next slide

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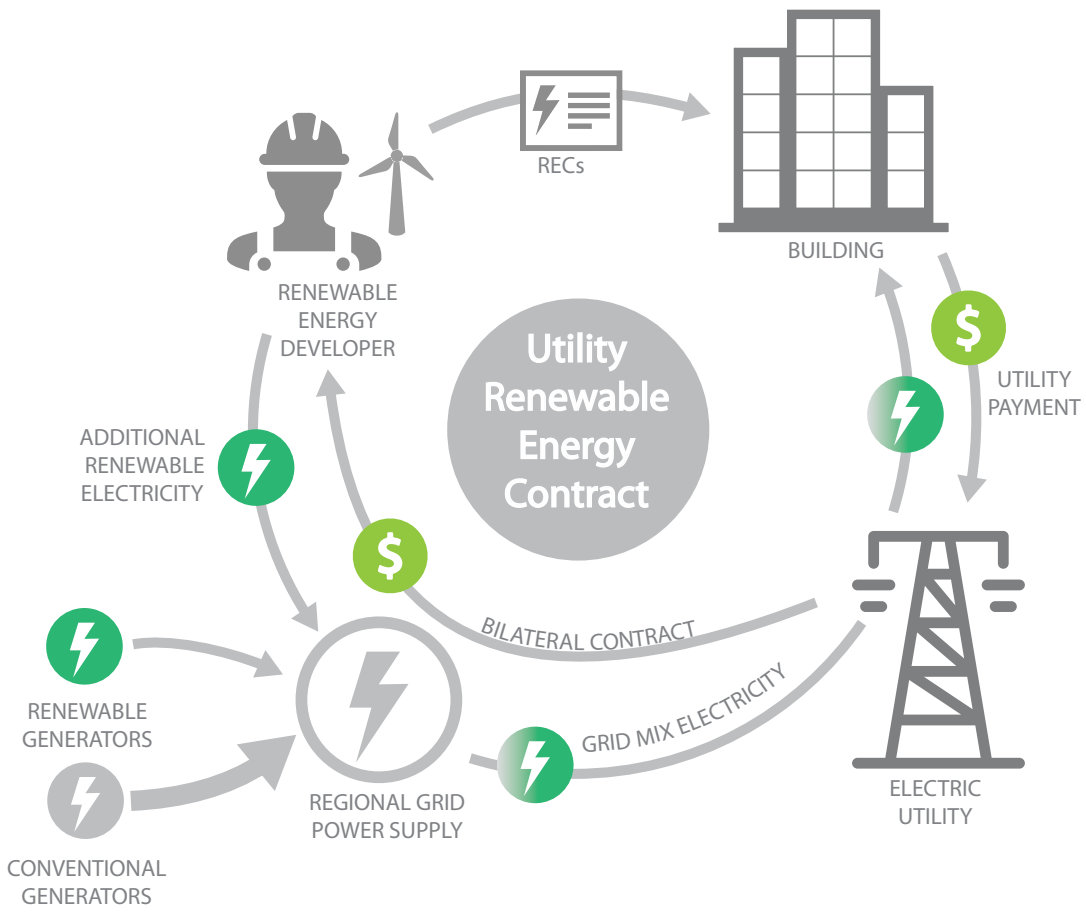
PPA/VPPA Opportunities

- Should RECs be required to receive GreenE (or other) certification?
  - This can help w/ compliance and verification (so as not to require verifying jurisdiction to become renewable energy experts)
- Do the RECs need to be w/in New England ISO?
- Different renewable energy purchasers have different criteria priorities (e.g. GHG/health impact may outweigh locality)
- Leverage credit-worthiness of large purchaser to bring smaller purchasers onboard to meet minimum required capacity
- Vicinity Energy can be anchor investor
- Better City: did weighting on which criteria were important to them – would be good for us to review

Utility Renewable Energy Contract / Direct Access to the Wholesale Markets



DISCUSSION:

Challenges:

- Available only to large customers.
- Some programs are backed by the purchase of unbundled RECs.
-

Opportunities:

- Potential benefits to the grid this route could have, which could then have greater positive (hopefully not negative) impacts to other customers.

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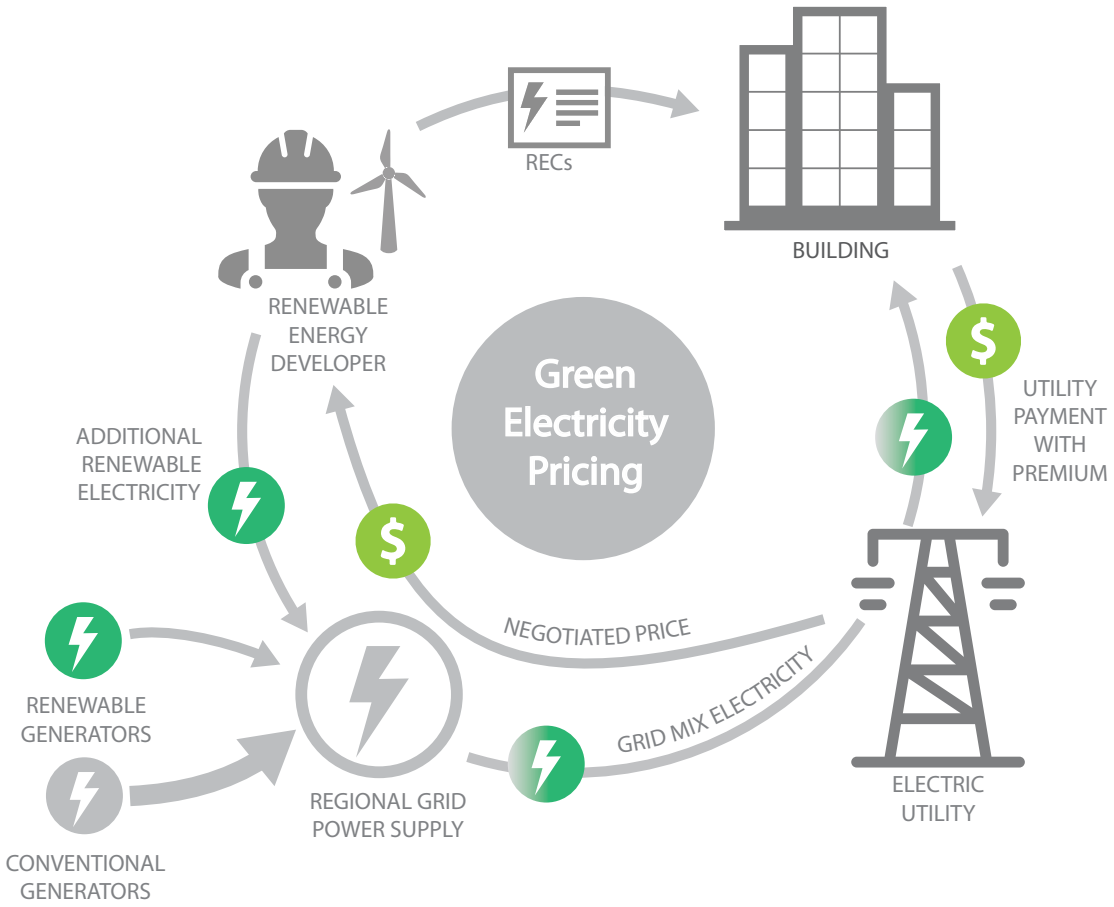
Green Retail Tariffs / Green Pricing / Green Municipal Aggregation



DISCUSSION:

Challenges:

- Purchase cannot exceed building electricity use.
- It's easy to opt out of the commitment.
- Renewable energy generators backing the claim may not be new and not always carbon free, e.g. biomass.
- Offerings are sometimes based on the purchase of unbundled RECs.
- Utility green tariffs not available in MA because they are not generally allowed to own generation.

Opportunities:

-

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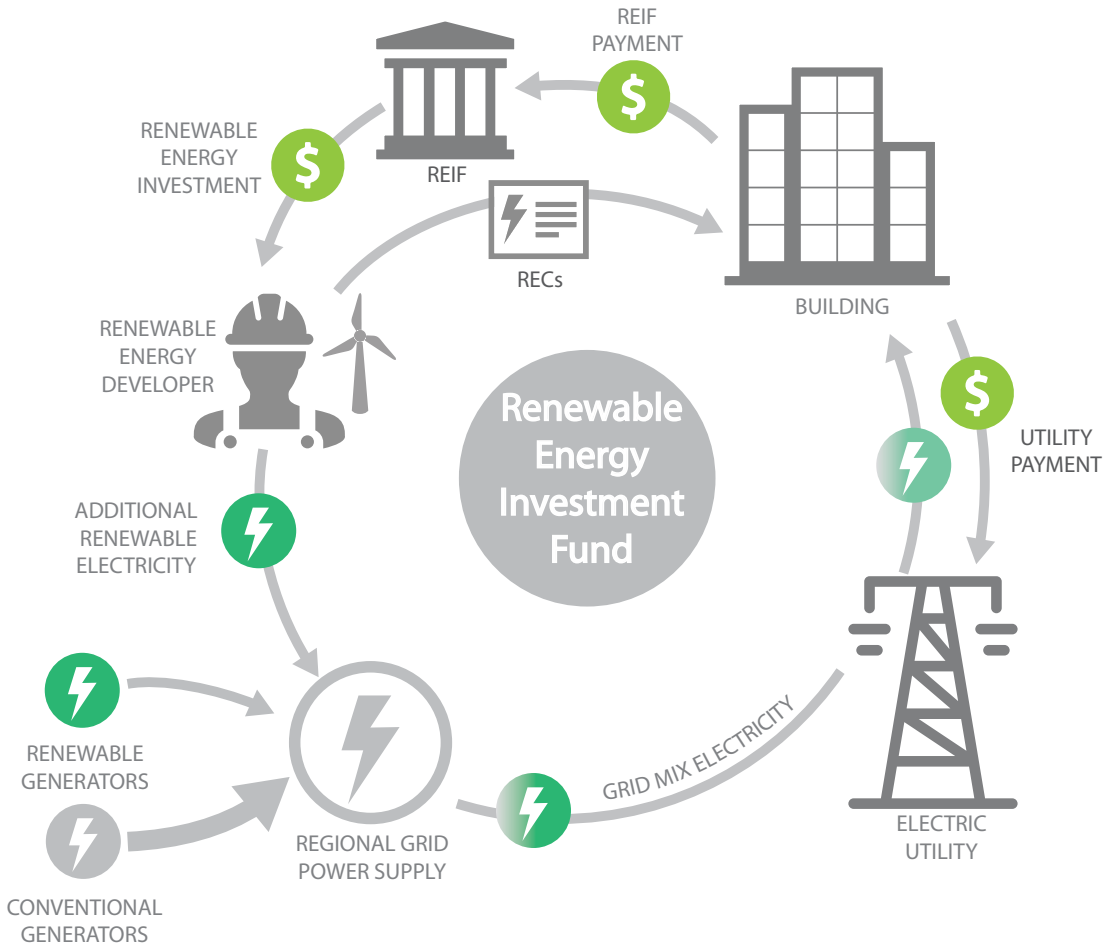
Renewable Energy Investment Fund



DISCUSSION:

Challenges:

- Similar to community solar, virtual PPAs or unbundled RECs, depending on how the revenue is invested.
-

Opportunities:

-

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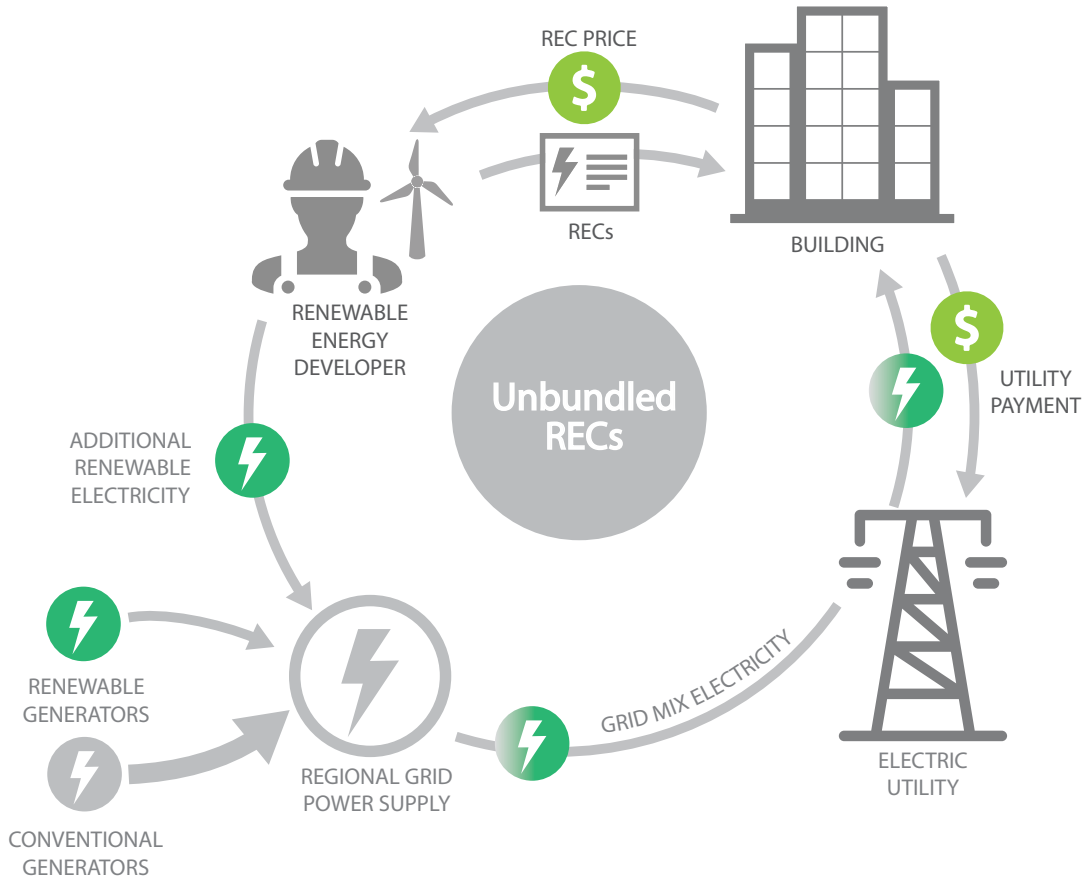
Unbundled Renewable Energy Certificates



DISCUSSION:

Challenges:

- Prices for RECs with no restrictions are quite inexpensive, calling to question their effectiveness in achieving additionality.
- Durability requires a forward contract for long-term purchase.
- Renewable energy generators backing the claim may not be new and not always carbon free, e.g. biomass.
-

Opportunities:

-

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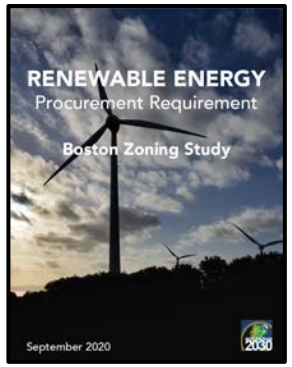
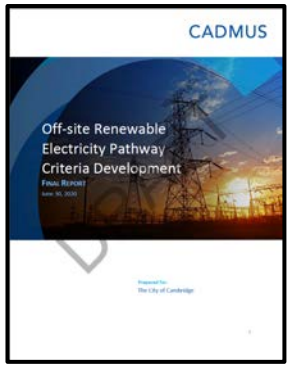
Classification Criteria (For Next Meeting)



- Impact
- Proximity
- Electricity Credit
- Grid Management
- Environmental Impact
- Inspirational/Educational Value
- Incremental Acquisition
- Permanent Financing



- Impact
- Location (Proximity)
- Accounting (RECs)
- Renewable Energy Generation Source

Renewable Energy to Offset Gas Emissions

- Requirements must be in terms of regulating GHG emissions
- GHG emissions from gas use is part of the calculation

Options:

- Renewable Energy Generation or Procurement shall provide a GHG emissions credit (reduction in total emissions) equal to the equivalent GHG emissions from the electricity grid it is displacing.*
- Carbon Offsets
- Alternative compliance payments (BERDO Update has this as an example)
- Renewable energy procurement can only apply to electricity; on-site ff consumption should be addressed w/ carbon offsets or alternative compliance, not additional procurement

*GHG emissions factor being for the electricity grid being determined separately in this planning process.

Building Emissions Performance Standard (BERDO)

Model design and results do not necessarily represent final policy design.

Each property must either meet the emission threshold *or* reduce emissions to a fixed percentage relative to its baseline emissions, including electric grid improvements

Building type	Emissions threshold (kgCO2e/SF)					
	2025	2030	2035	2040	2045	2050
Assembly	7.8	4.6	3.3	2.1	1.1	0.0
College/University	10.2	5.3	3.8	2.5	1.2	0.0
Education	3.9	2.4	1.8	1.2	0.6	0.0
Food Sales & Service	17.4	10.9	8.0	5.4	2.7	0.0
Healthcare	15.4	10.0	7.4	4.9	2.4	0.0
Lodging	5.8	3.7	2.7	1.8	0.9	0.0
Manufacturing/Industrial	23.9	15.3	10.9	6.7	3.2	0.0
Multifamily housing	4.1	2.4	1.8	1.1	0.6	0.0
Office	5.3	3.2	2.4	1.6	0.8	0.0
Retail	7.1	3.4	2.4	1.5	0.7	0.0
Services	7.5	4.5	3.3	2.2	1.1	0.0
Storage	5.4	2.8	1.8	1.0	0.4	0.0
Technology/Science	19.2	11.1	7.8	5.1	2.5	0.0

OR

Emissions target relative to 2018 baseline*	
2025	76%
2030	52%
2035	39%
2040	26%
2045	13%
2050	0.0%

*Targets may be adjusted if a different baseline year is selected

DRAFT

Source: Synapse model

www.synapse-energy.com | ©2020 Synapse Energy Economics Inc. All rights reserved.

Building Emissions Performance Standard (BERDO)

- Off Site-Renewable Requirements
  - Allowed Types of Off Site Renewable:
    - Unbundled Mass Class 1 RECs from Non-Emitting Sources
    - Long-term Virtual Power Purchasing Agreement that demonstrates additionality
      - Additionality = grid that the VPPA is offsetting is dirtier than New England's
    - Community Choice Energy Program
- RECs must be retired and be generated in the year covered
- Off site renewable energy can only be used to offset electricity demand
- City is considering allowing offsets, but not until later date (2030 or beyond)
- Alternative Compliance Payment compliance pathway for buildings missing yearly emissions target, measured as by $/MT CO2e
- MPAC is currently working on legislative language for a bill that would put into place a very similar BPS statewide

DRAFT

Other Community Concerns

- Local Markets
- Local Investments (e.g. Community Controlled)
- Community Solar
- **DISCUSSION: Others?**

Reports, Precedents and Other Resources

- BERDO Summary w/ focus on Renewable Energy Procurement
- Renewable Energy Procurement Requirement Boston Zoning Study (Revision 4) by Architecture 2030
- City of Cambridge Off-Site Renewable Electricity Criteria Development Report by Cadmus for the City of Cambridge
- MA E-Z Code 2.0 Proposal to BBRS
- AIA MA Proposal to BBRS
- Community Choice Electricity Program
- ZERO Code Technical Support Document for the Off-site Procurement of Renewable Energy (December 2020)
- ABC's Innovation Through Aggregation Study