BU | Institute for Sustainable Energy

BOSTON Green Ribbon COMMISSION

A study of carbon offsets and RECs to meet Boston's mandate for carbon neutrality by 2050

1. Problem Statement
Current State: BU ISE is analyzing GHG reduction in the City of Boston to helping to get to **net zero scope 1 and 2 greenhouse gas emissions by 2050**
Desired State: Incorporate an analysis of carbon offsets and RECs to enable appropriate use of indirect mechanisms to reach net zero

2. The importance of considering Offsets and RECs
The target of the City of Boston to achieve carbon neutrality by 2050, from a current level of around 7M metric tons of CO2, would not be achievable only with direct reduction of emissions. The City has limited control over some emissions including the regional grid and therefore Offsets and RECs are additional tools to achieve the goal.

3. Sense-making:
Boston requires a clear understanding of Offsets and RECs and what makes them controversial in order to use these tools effectively to achieve carbon neutrality
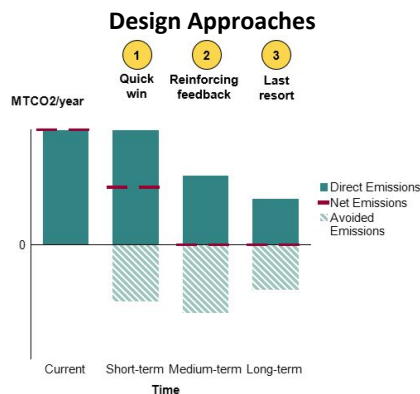

Source: EPA Green Power Partnership 2018
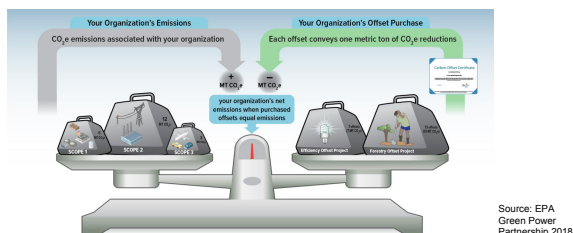
4. Addressing the hurdles:
How to select the best Offsets and RECs using PAVER+ Criteria
- **Permanent**: Emission reduction cannot be reversed
- **Additional**: Beyond business-as-usual
- **Verifiable**: Measured and confirmed
- **Enforceable**: Legally conferred to a single owner
- **Real**: Results in a real net reduction of GHGs
- **Co-benefits**: Societal benefits beyond reduced GHGs
- **Contemporary**: Avoided GHGs are synchronous with offset emissions

Topic of Difference	Offset	REC
Purpose	Direct financial support to emission reduction activities, increasing viability and scope	Drive market demand for renewable energy, increasing development
Accounting application	Scope 1, 2, or 3 emissions	Only scope 2 emissions
Units	Metric tons of CO2 or CO2 equivalent	Megawatt hours
Types of qualifying projects	Energy efficiency Renewable energy Carbon capture and storage Methane or industrial gas mitigation	Renewable energy
Benefits conveyed	Greenhouse gas reductions	All societal benefits from renewable energy

5. Evaluation Results and Recommendations

Difficulty level	Renewable Energy (offsets and RECs)	Biological Carbon Sequestration	Geological Carbon Sequestration	Energy Efficiency	Methane combustion	Industrial gas mitigation	Carbon permit retirement
Permanent	Low	High	High	Low	Low	Low	Low
Additional	Low	High	High	Low	Medium	Medium	Medium
Verifiable	Low	Medium	Medium	Low	Low	High	Medium
Enforceable	Low	Medium	High	Medium	Medium	High	Medium
Real	Low	Medium	High	Low	Low	Medium	Low
Co-benefits	Medium	Low	High	Low	Medium	High	Medium

Risk							
Market/financial	Medium	Low	High	Low	High	Low	Low
Tech/implementation	Medium	Low	High	Medium	Low	Low	Medium
Policy/Regulation	Medium	Low	Medium	Low	High	High	Medium
Supply Chain	Low	Low	Medium	Low	High	Low	Low
Reputational	Low	Medium	High	Low	High	High	Medium

Design Approaches

1 Quick win
2 Reinforcing feedback
3 Last resort

MTCO2/year

Direct Emissions
Net Emissions
Avoided Emissions

Current | Short-term | Medium-term | Long-term
Time

6. Next Steps for Boston:
Leverage case studies to select program design and prioritize criteria for selecting best program components

Cities and States	Universities	Corporations
• London • Melbourne • Copenhagen • California • Berlin • San Francisco • Boulder • Cambridge • Seattle • Palo Alto	• MIT • Harvard • Duke • Colgate University • Stanford • The Carbon Offset Network • American University	• Apple • Google • Facebook • Biogen • Microsoft • Lyft

California Offset Purchase Program

Context: California requires 1990 levels of GHG emissions by 2020; 40% below that by 2030
Approach: Forestry cap and trade program
Takeaways: Stanford researchers *validated the additionality*; *local resources* utilized well