

Tech Specs for All-Electric Buildings

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Energy Cohort Session

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LLSC BOSTON

The logo for the Massachusetts Association of Community Development Corporations (MACDC) features a stylized graphic of three human figures in blue and green, with a green bar below them. To the right of the graphic, the letters "MACDC" are written in a bold, sans-serif font, with "MA" in green and "CDC" in blue.

Massachusetts Association of Community Development Corporations

NEW ECOLOGY
Community-Based Sustainable Development

Agenda for Discussion

- Welcome (5 min)
- All-Electric Tech Specs Facilitated Presentation/Discussion (30 min)
- All-Electric Tech Specs Q&A (15 min)
- Announcements from MAPC, RMI, MACDC, and LISC (10 min)

Important Background Information

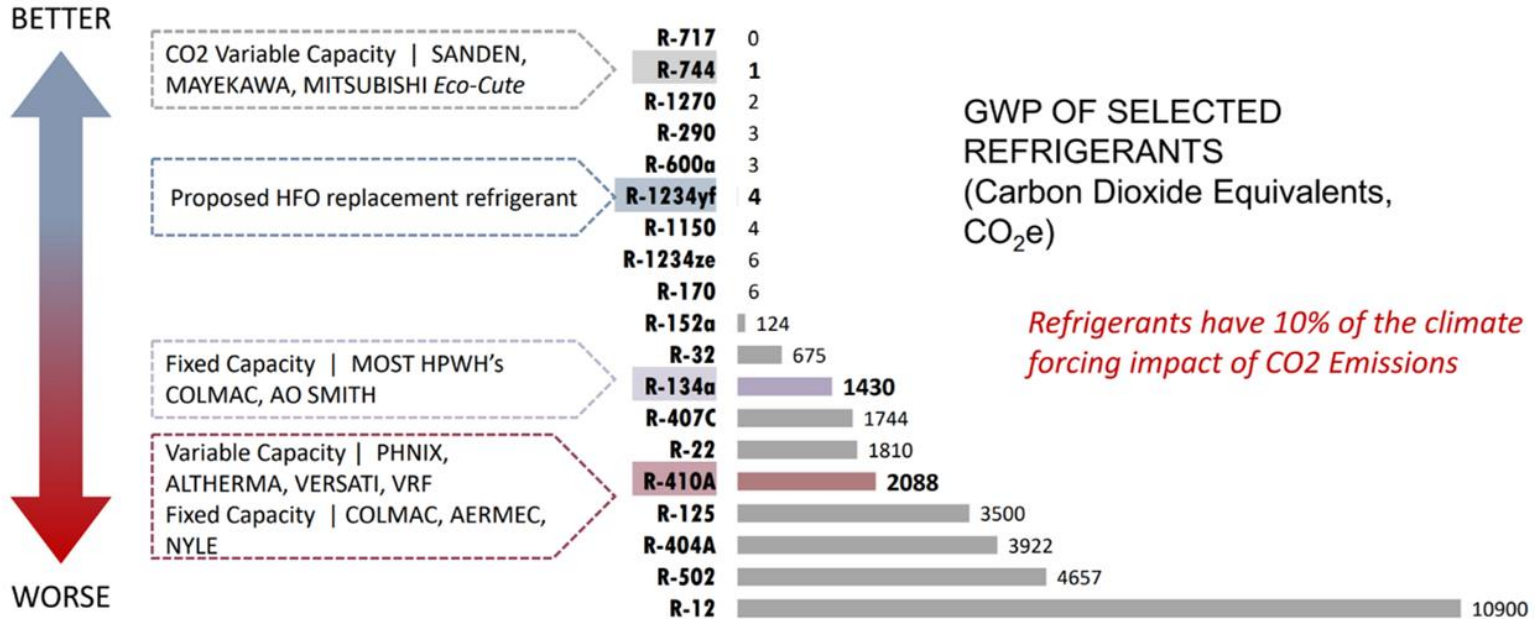
Metering

Options for Metering

- All Systems on central electric meter
- Some/all systems on tenant electric meter
- Fully master metered - all on one central electric meter (if applicable)



Important Background Information Refrigerant



Challenges: GPW - varies based on refrigerant

All-Electric Mechanicals: Heating

- Refrigerant/compressor based heat generation and transfer
- >1-1 Performance*
- Air or Water Source

Spark Spread

1 therm = 100,000 BTU (\$1.20)

1 kWh = 3,412 BTU (\$.22)

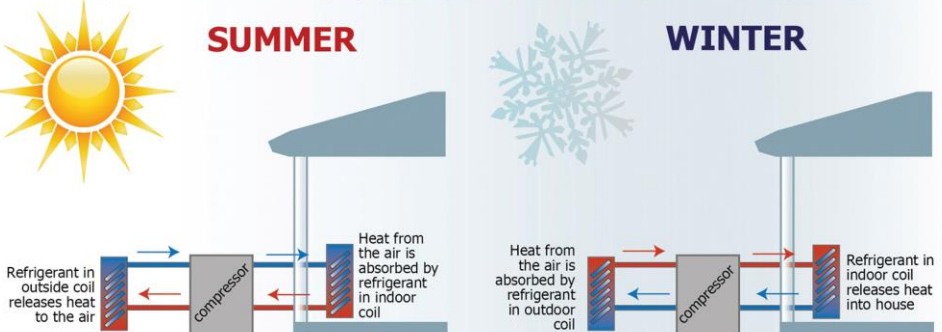
kWh in 100,000 BTU = 29.3 (\$6.45)

1 BTU produced by electric is 5.4x more expensive than 1 BTU produced by gas

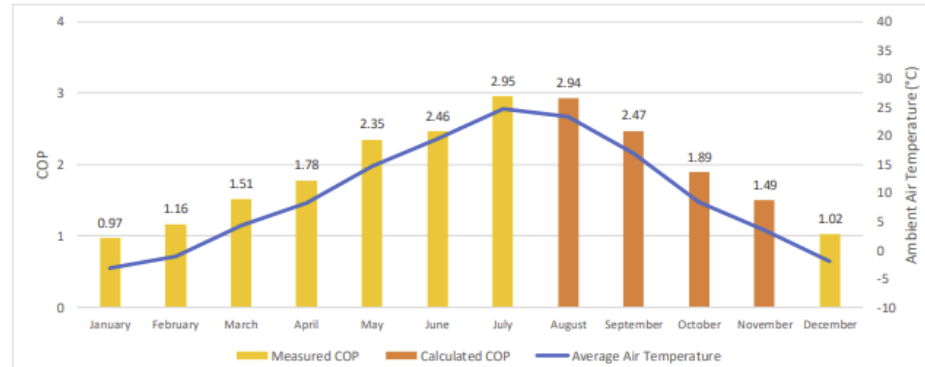
HOW AN AIR SOURCE HEAT PUMP WORKS

SUMMER

WINTER



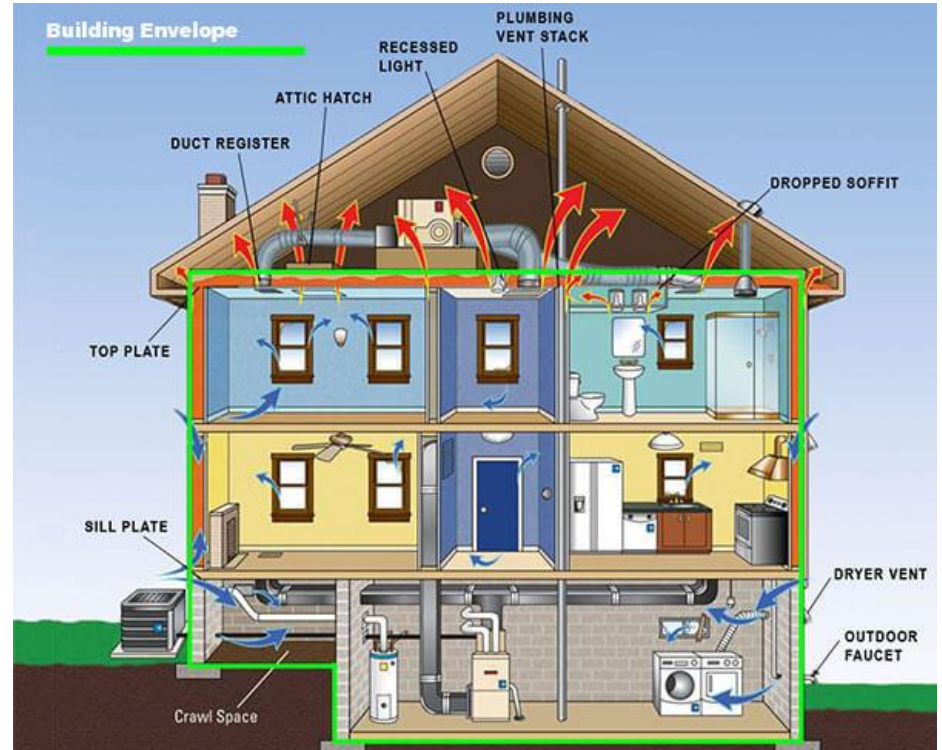
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Important Background Information

Building Envelope

- High performance envelope
 - **New Construction**
 - **Retrofit**
- Critical to controlling the amount of heating energy the building needs and the cost to run electric systems



Heating & Cooling

Air Source Heat Pump – “Mini-Split”

Meter	Tenant
Space Needed	High (lots of roof equipment)
Efficiency	Yes
Scale of GHG Reductions	★★ (medium)



Heating & Cooling

Package Terminal Heat Pump (PTHP)

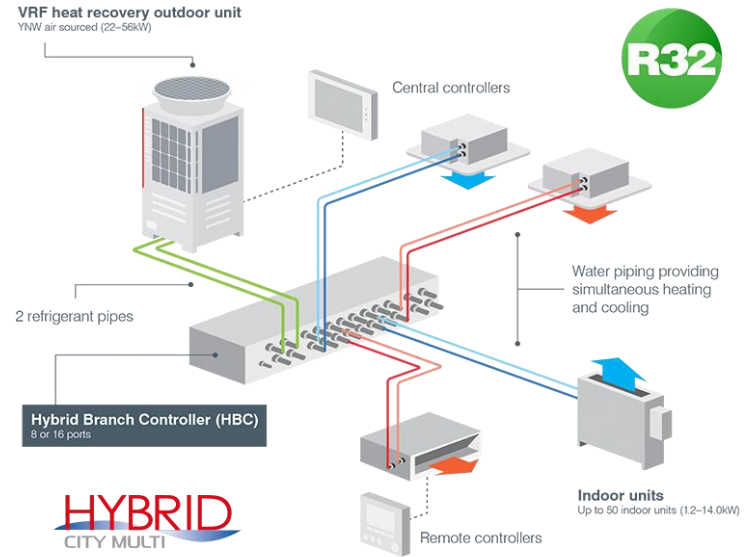
Meter	Tenant
Space Needed	Low (exterior wall only)
Efficiency	Yes
Scale of GHG Reductions	★★★ (high)



Heating & Cooling

Air Source Heat Pump – VRF

Meter	Central
Space Needed	Medium (some roof equipment)
Efficiency	Yes
Scale of GHG Reductions	★★ (medium)



Heating & Cooling

Air to Water Heat Pump

Meter	Central
Space Needed	Medium (some roof equipment)
Efficiency	Yes
Scale of GHG Reductions	★★ (medium)



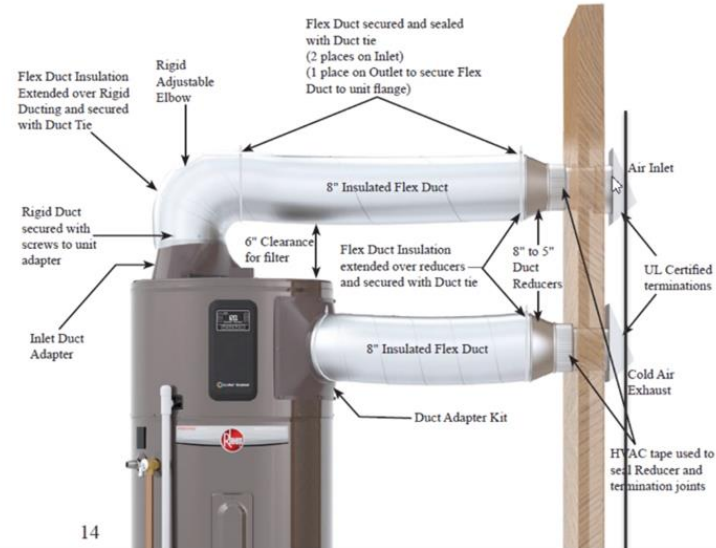
Domestic Hot Water Electric Resistance (Unit-Based)

Meter	Tenant
Space Needed	Low (no roof equipment)
Efficiency	No
Scale of GHG Reductions	★ (low)



Domestic Hot Water Heat Pump Water Heater (Unit-Based)

Meter	Tenant
Space Needed	Low (no roof equipment)
Efficiency	Yes
Scale of GHG Reductions	★★ (medium to high)



Domestic Hot Water

Heat Pump Water Heater (Central or Semi-Central)

Meter	Central
Space Needed	Low (no roof equipment)
Efficiency	Yes
Scale of GHG Reductions	★★ (medium to high)



Making Sure Your All-Electric Building Is All-Electric

- Stove/cooktop
- Dryers
- ERV's/RTUs for ventilation
- Emergency generation



Thank You!

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Petersen
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