

# BUILDINGENERGY BOSTON

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## Refrigerants: Rethinking their Role in Electrification

Neil Donnelly, New Ecology

JS Rancourt, DXS

Tom Secondo, R.W. Sullivan

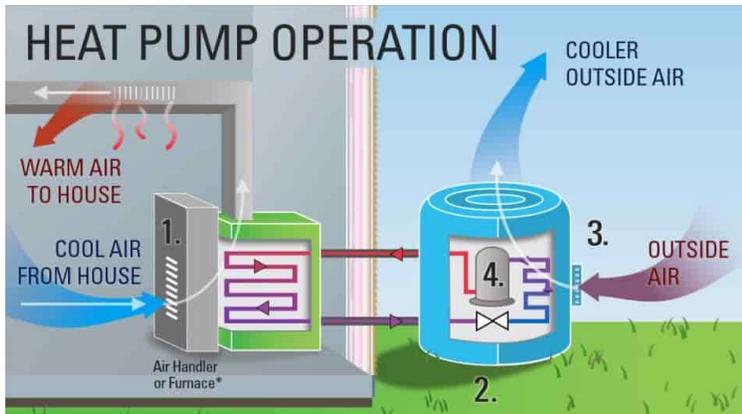
*Developed by Ching-Wen Hsiao and Miary Rasoanaivo, New Ecology*

*Curated by Brendan Kavanagh and Ashley Wisse*

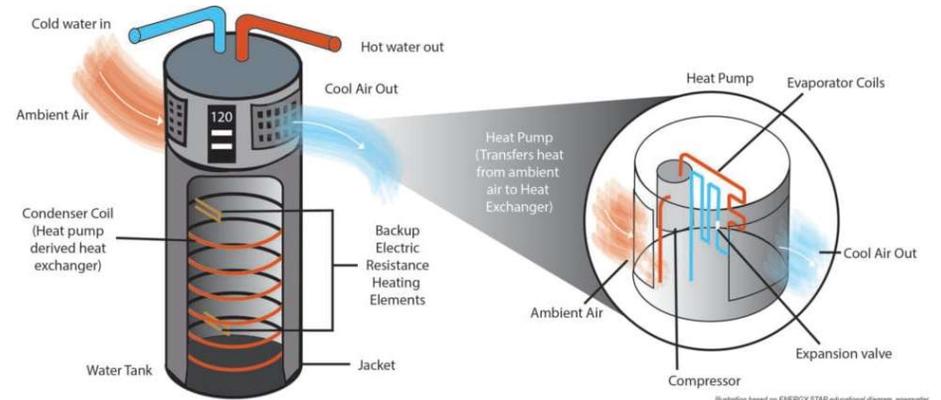
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Northeast Sustainable Energy Association (NESEA) | March 21, 2025

# To decarbonize buildings we must electrify...



... heating and cooling



... and domestic hot water

Source: <https://www.mechstudies.com/wp-content/uploads/2023/09/heat-pump-working-ingas-furnace-vs-heat-pump-difference.jpg>  
<https://www.trcccompanies.com/projects/heat-pump-water-heater-pilot-program/>

Which also means we need  
refrigerants!

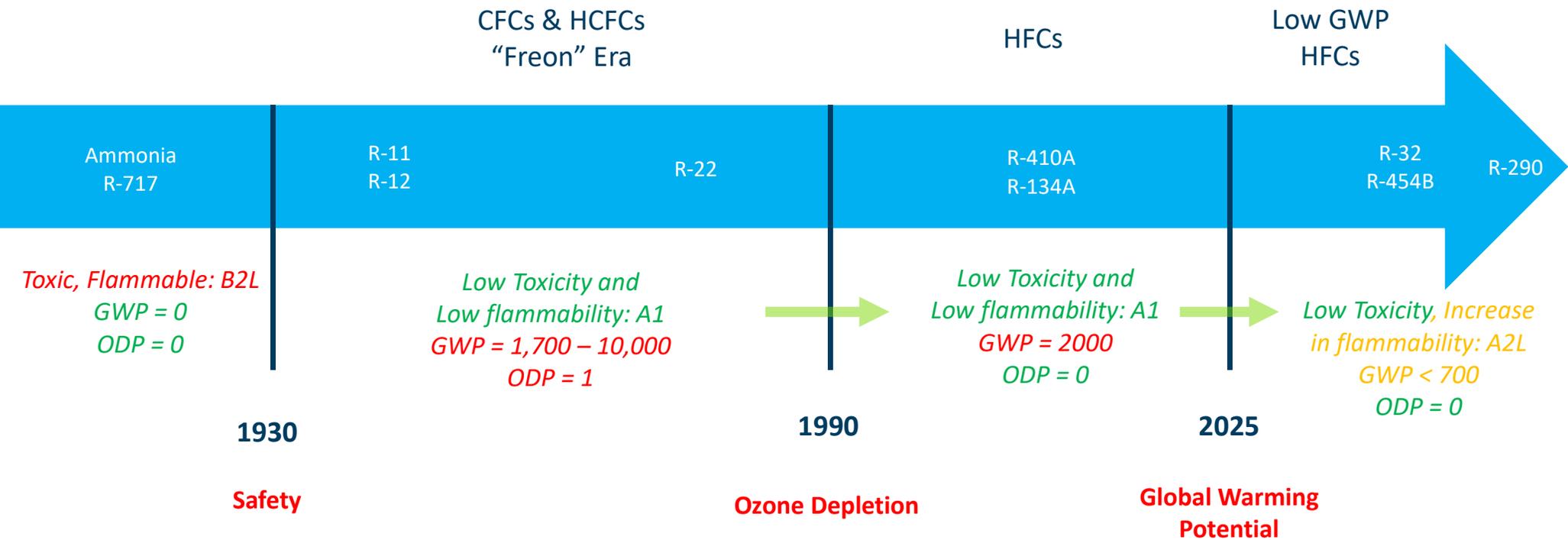


Source: MIT Science Policy Review.  
<https://sciencepolicyreview.org/2020/08/institutions-and-governments-can-slow-climate-change-by-regulating-and-reducing-halocarbon-refrigerant-use/>

# Open Introduction

## History of Refrigerants

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Source: DXS & HTS, JS Rancourt

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## Now what?

The Phase out is a success story:

- Implementation
- Alternative options



# Panel Discussion

## Part I

### **Regulatory Response and Design Impacts**

20 mins

Part I: Q & A – 5 mins

## Part II

### **Innovative HVAC Design Alternatives to Minimize Refrigerants**

20 mins

Part II: Q & A – 5 mins

# Panel Discussion

## Panelists

### **JS Rancourt**

Principal  
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### **Tom C. Secondo**

Principal  
R.W. Sullivan  
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### **Neil Donnelly**

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## Moderator

### **Maciej Konieczny**

Director of Building Technologies,  
New Ecology, Inc.  
konieczny@newecology.org



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# Panel Discussion

## Part I

### **Regulatory Response and Design Impacts**

20 mins

Part I: Q &A – 5 mins

## Part II

Innovative HVAC Design Alternatives to Minimize Refrigerants

20 mins

Part II: Q & A – 5 mins

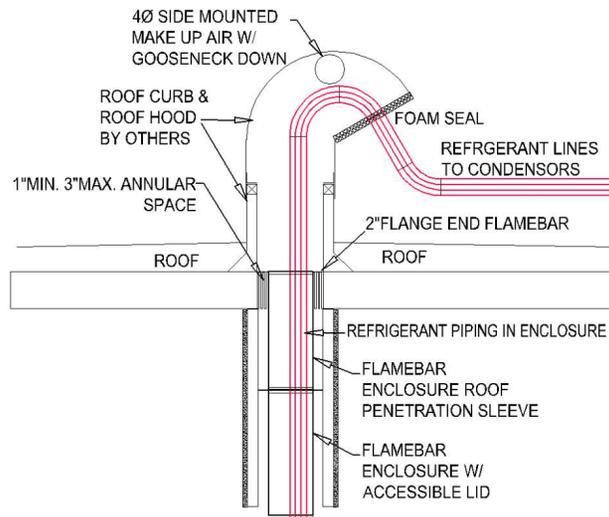


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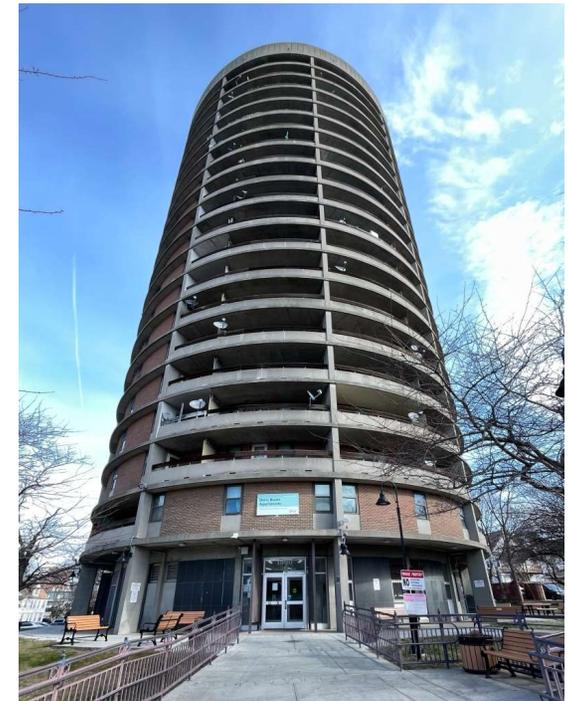
# Regulatory Response and Design Impacts

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- What are the impacts on the architectural design and HVAC design?
- Impacts on refrigerant leakage?



Ventilated Shafts



Retrofits



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## Regulatory Response and Design Impacts

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- What are the impacts on the architectural design and HVAC design?
- Impacts on refrigerant leakage?



Source: <https://drexel.edu/news/archive/2024/June/EPA-HFC-reduction-plasma>



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# Regulatory Response and Design Impacts

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**Q & A - 5  
mins**



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# Panel Discussion

## Part I

Regulatory Response and Design Impacts

20 mins

Part I: Q &A – 5 mins

## Part II

**Innovative HVAC Design Alternatives to Minimize Refrigerants**

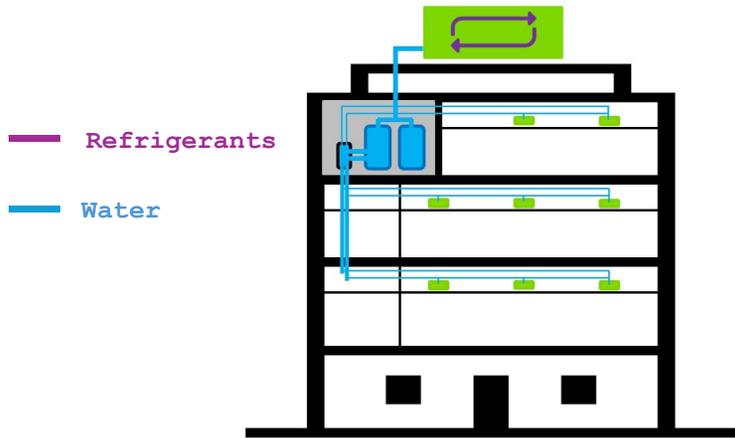
20 mins

Part II: Q & A – 5 mins

# Innovative HVAC Design Alternatives to Minimize Refrigerants

Air to Water HP (future proof option)

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- Modular vs unitary
- 4 pipe system needed?
- Cost?
- ccHP chillers performance?



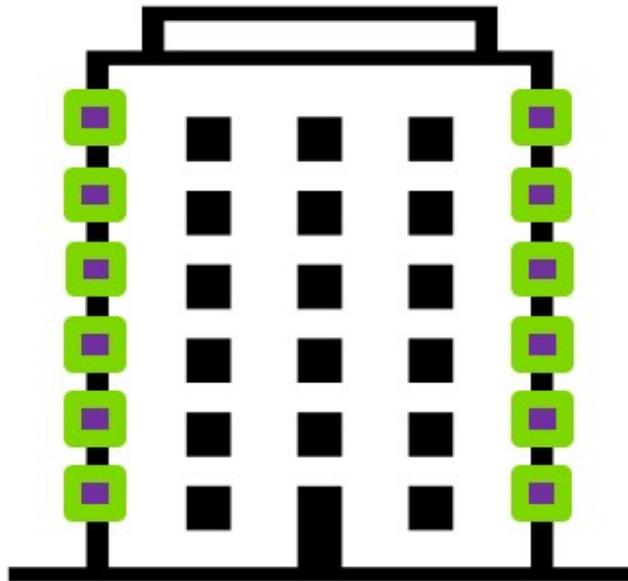
Source: DXS & HTS, JS Rancourt

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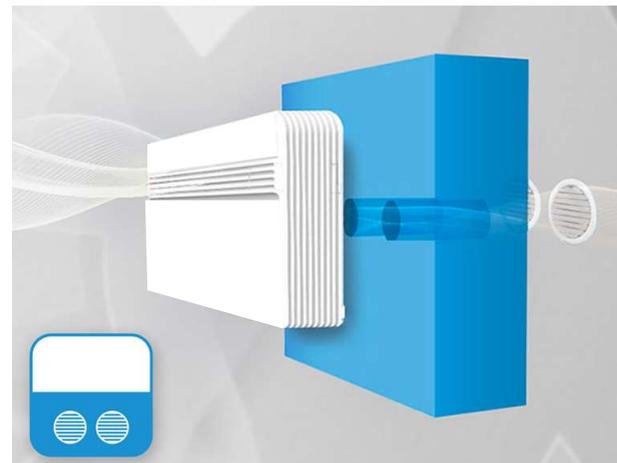
# Innovative HVAC Design Alternatives to Minimize Refrigerants

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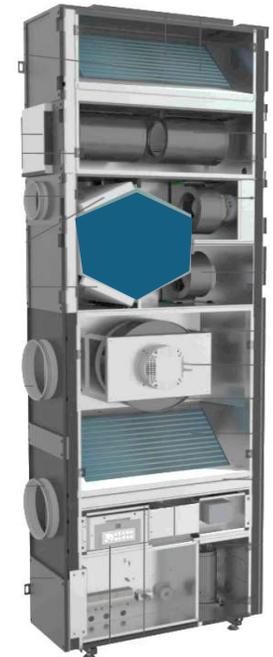
## Package Terminal Heat Pump



Source: DXS & HTS, JS Rancourt



Source: manufacturer's website

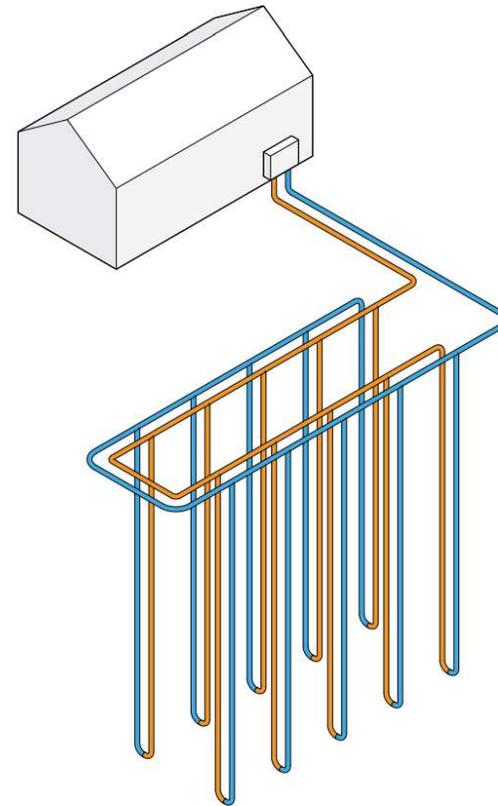


## Innovative HVAC Design Alternatives to Minimize Refrigerants

What are other options?  
Geothermal

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- Eliminates refrigerant distribution
- Traditional system 'inside' the building
  - WSHP in apartments
- Longevity?
- With IRA lower first cost



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# Innovative HVAC Design Alternatives to Minimize Refrigerants

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**Q & A - 5  
mins**

# Thank you!

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## Glossary

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EPA: U.S. Environmental Protection Agency

GWP: global warming potential

ODP: Ozone depletion potential

HFCs: Hydrofluorocarbons

HCFCs: Hydrochlorofluorocarbons

CFCs: Chlorofluorocarbons

SNAP: Significant New Alternatives Policy  
(SNAP) program

IMC: The International Mechanical Code