2022 ENGINEER SUMMIT

Working Together

Tackling Sustainability Challenges through Decarbonization

November 14, 2022

Honor your Roots

James A Trane

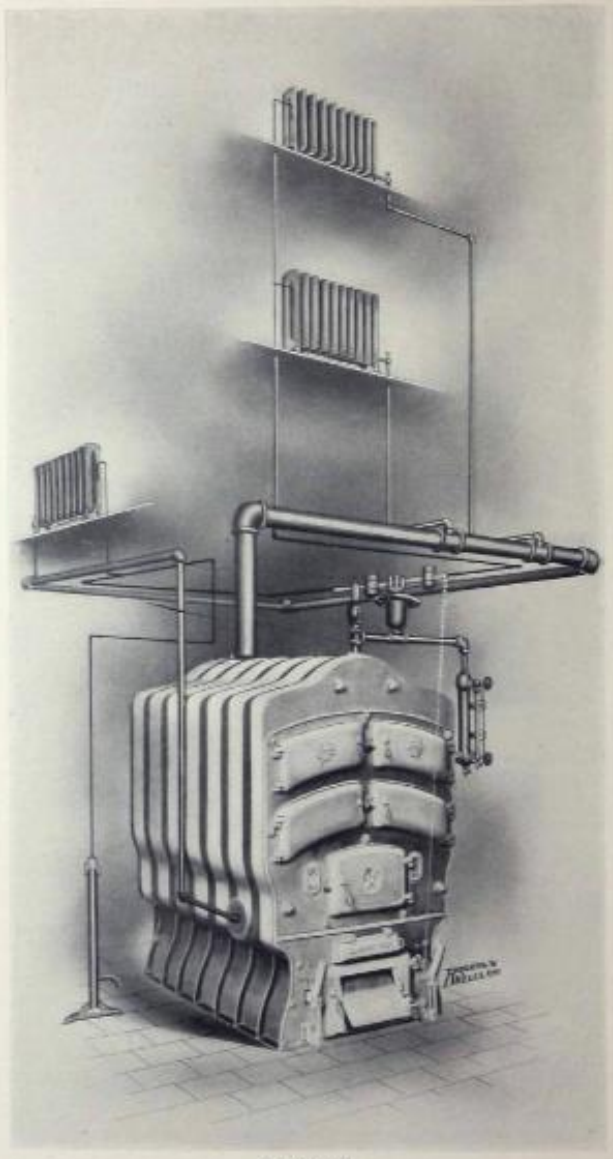


PLATE V

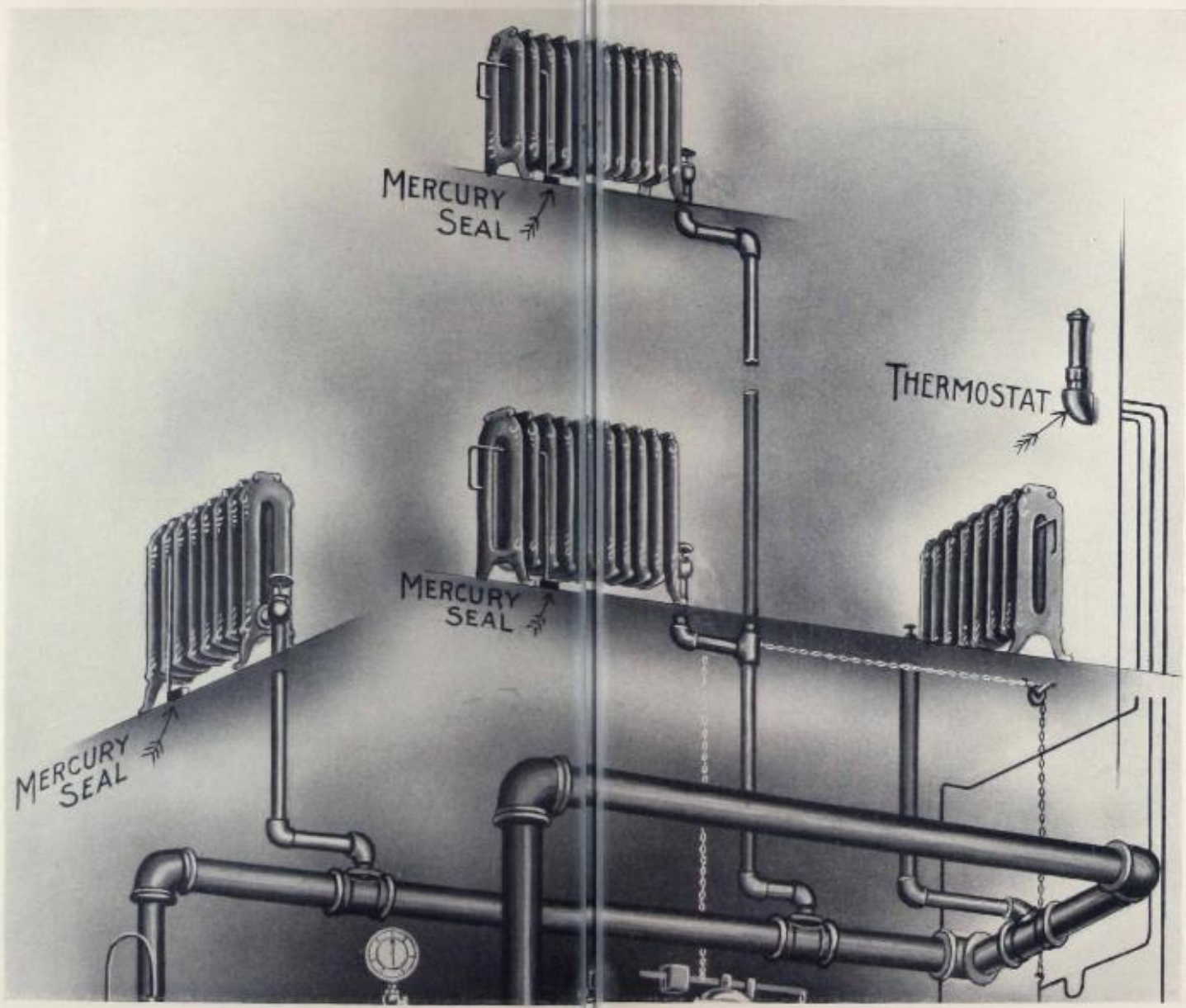


Plate VI gives a general illustration of the Direct Mercury Seal Vacuum System. This plate is intended to be of sufficient size to enable the reader to thoroughly understand the construction and arrangement of the Jas. A. Trane Direct Mercury Seal Vacuum Heating System.

SUSTAINABILITY LEADER

Driving Performance Through Sustainability

Before 2010

Focus on environmental and safety compliance

2010

Center for Energy Efficiency & Sustainability **(CEES)** is founded and begins operating

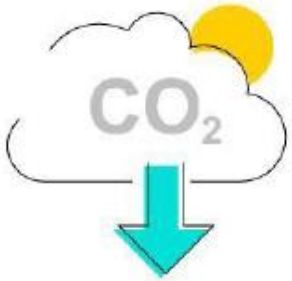
Launched internal diversity and inclusion council

2012

Internal and External Sustainability Advisory Councils formed and begin meeting

2014

First set of major goals "2020 Climate Commitments" announced



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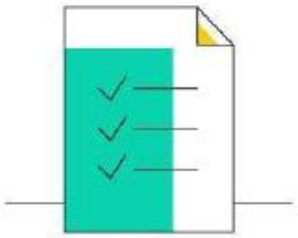
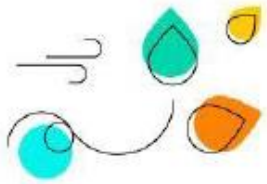


2022

Net-zero targets validated by **SBTi**

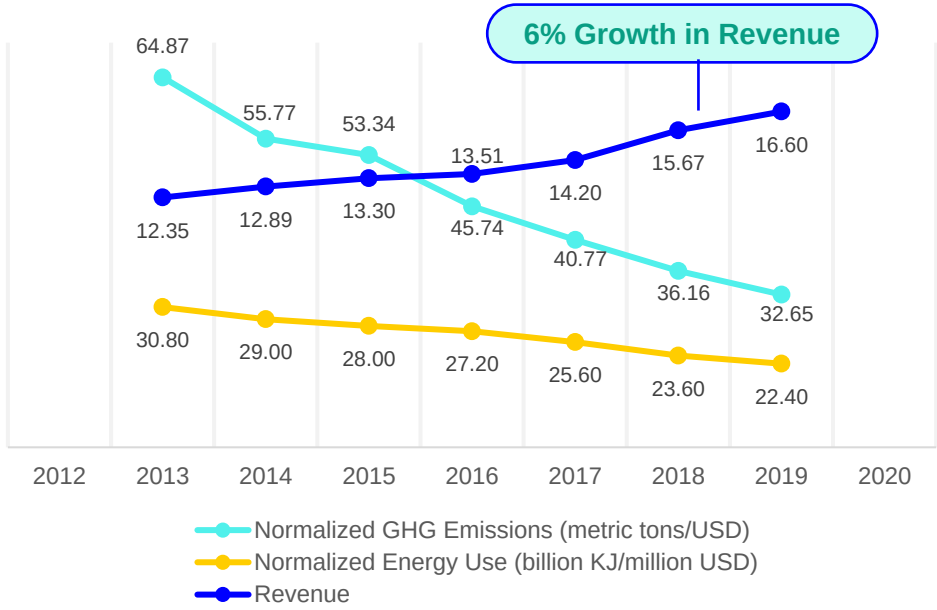


TRANE TECHNOLOGIES

We exceeded our 2020 commitments early…

Commitment	Result	
35% Reduction in GHG footprint of our operations	**+24%** increase in energy efficiency **~1/3** of electricity demand met with renewables	**51%** Reduction in Operational GHG Emissions Intensity
50% Reduction in the GHG refrigerant footprint of our product portfolio	**$500M** R&D spend on low GWP refrigerant innovation	**80%** Reduction in the GHG refrigerant footprint of our product portfolio

Growth with Fewer Resources



Gold Medal Winner
35th annual award for International Achievement in Sustainable Development

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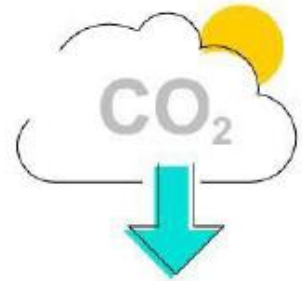

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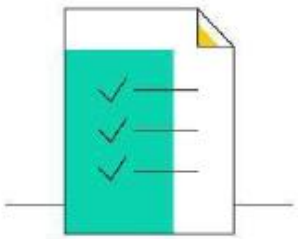

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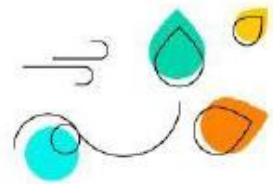


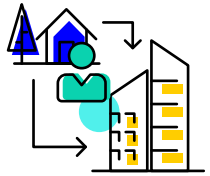
TRANE TECHNOLOGIES

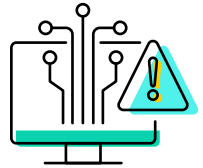
And established bold, new commitments for 2030

We See **Opportunities in the World's Challenges…**


Sustainability


Climate Change


Urbanization


Technological Disruptions


Demographics

Our **2030 Commitments**

Gigaton Challenge

Reduce customer carbon footprint by **1 gigaton***

- ✓ Accelerate clean technologies that heat and cool buildings in sustainable ways
- ✓ Increase energy efficiency in buildings, homes and transport environments
- ✓ Reduce food loss in the global cold chain
- ✓ Transition out of high-Global Warming Potential Refrigerants by 2030 – ahead of regulation

Design systems for circularity

Increase access to heating, cooling and fresh food

*1B metric tons of CO_2e

Leading by Example

Achieve carbon neutral operations

Deliver zero waste to landfills

Become net positive with water use

Reduce absolute energy consumption by 10%†

†Compared to 2019 baseline

Opportunity for All

Achieve workforce diversity reflective of our communities

Achieve gender parity in leadership roles

Maintain world-class safety metrics

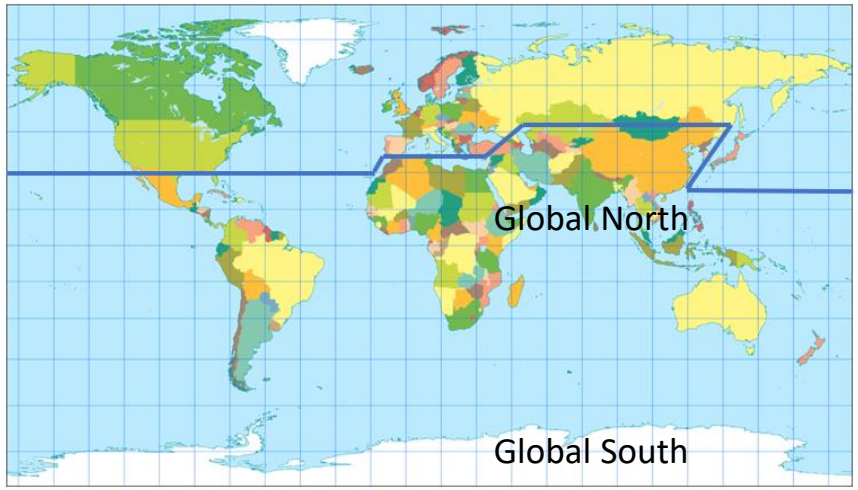
Provide market-competitive wages, benefits and leading wellness offerings for workforce

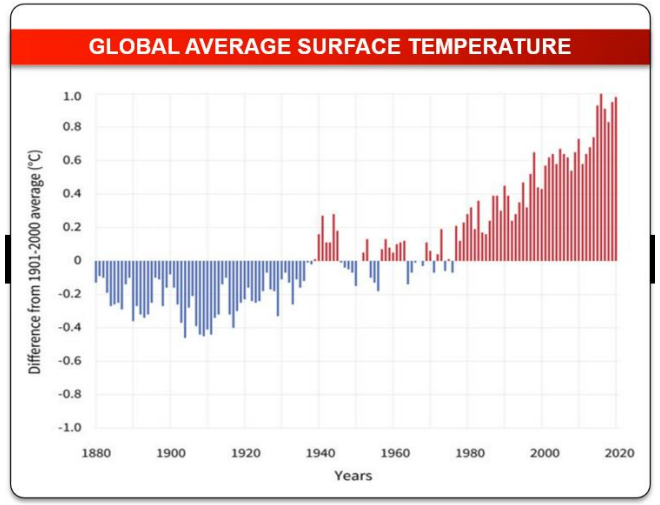
Invest $100 million in building sustainable futures for under-represented students

Dedicate 500,000 employee volunteer hours in our communities

The Evolving Landscape

- 2015- Global Climate Accord in Paris– Goal to limit warming by 2C.
- In 2018, with more data the goal changed to 1.5C. We have to decarbonize faster. 2.7C Now expected. (UN IPCC)
- Double the occupied space globally by 2060 – 230B square meters but only 20% of new space will be in the Global North (IISD)*
- New space added equivalent to the size of NYC every month for the next 37 years
- The 5 hottest years on record happened in the past 6 years (CCCS)**
- 2022 will likely be in the top 3 (NOAA)***
- Cooling hours will increase as a result of Climate Change. Some locations in the Global North will see hours increase 50% to 200%***





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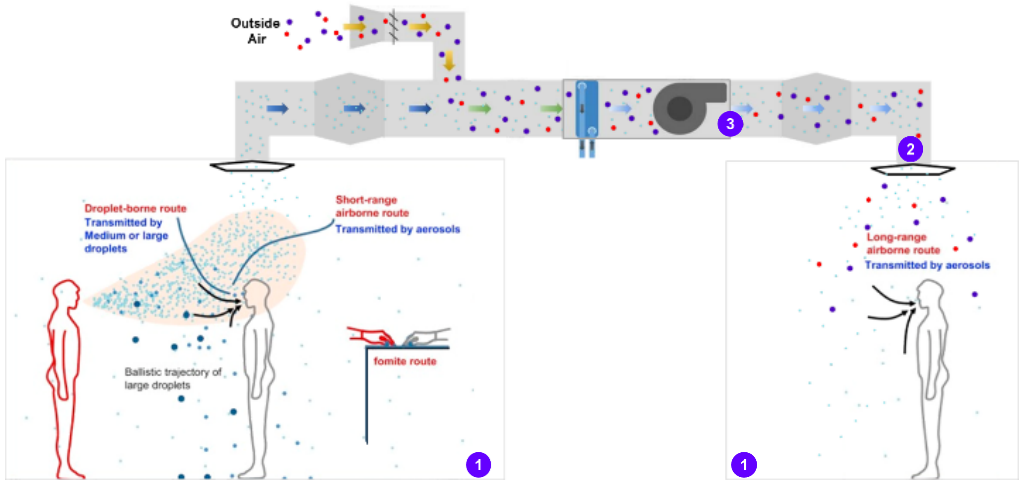
* IISD –International Institute for Sustainable Development
** Copernicus Climate Change Service
*** NOAA

The Evolving Landscape

- Humans spend 85% of their time indoors. The remaining 15% includes time spent in cars (NHAPS)*
- 33% of our time is spent in bedrooms
- Consequences of Climate Change include overheating, spread of infectious disease like Malaria, more wildfires, more ambient air pollution.
- As global temperature increases, the CO2 content in air also increases. Ventilation rates will increase accordingly
- We need healthy and efficient spaces to live and work.
  - Thermal
  - Acoustic
  - Indoor Air Quality
  - Lighting

Keys to productive work performance, better sleep, better educational results.



*National Human Activity Pattern Survey

Decarbonization

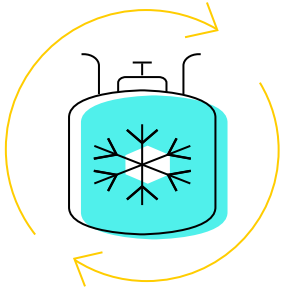
Transport | Buildings | Industry | Food/Ag | Power Generation

Where Are Emissions Generated From?

Operational Emissions

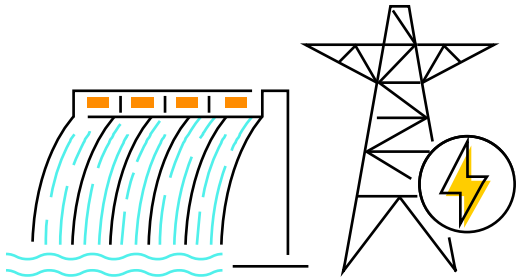
Scope 1 Emissions

Direct Fossil Fuel Combustion



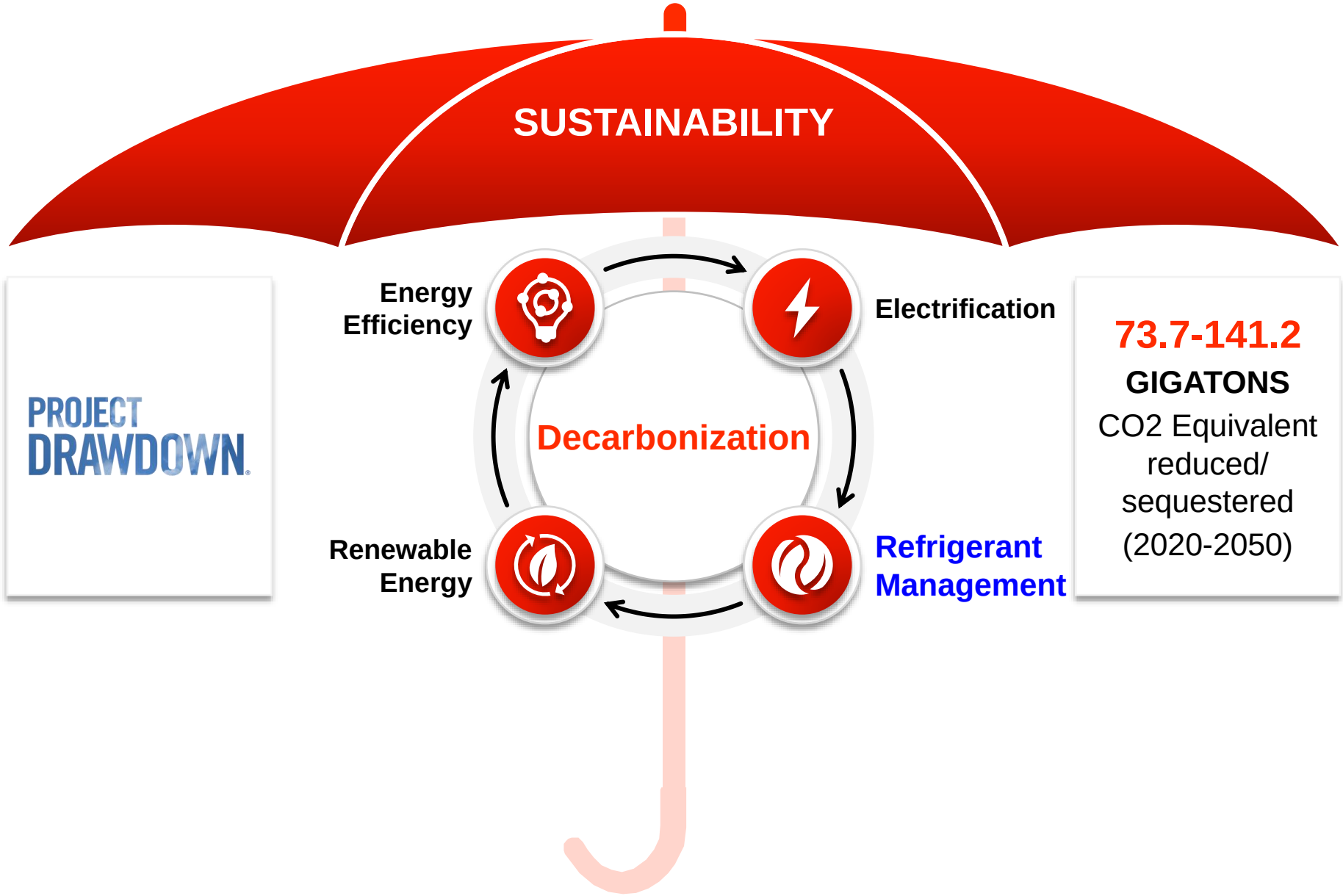
Refrigerant Emissions

Scope 2 Emissions



Carbon Intensive Electricity Sources

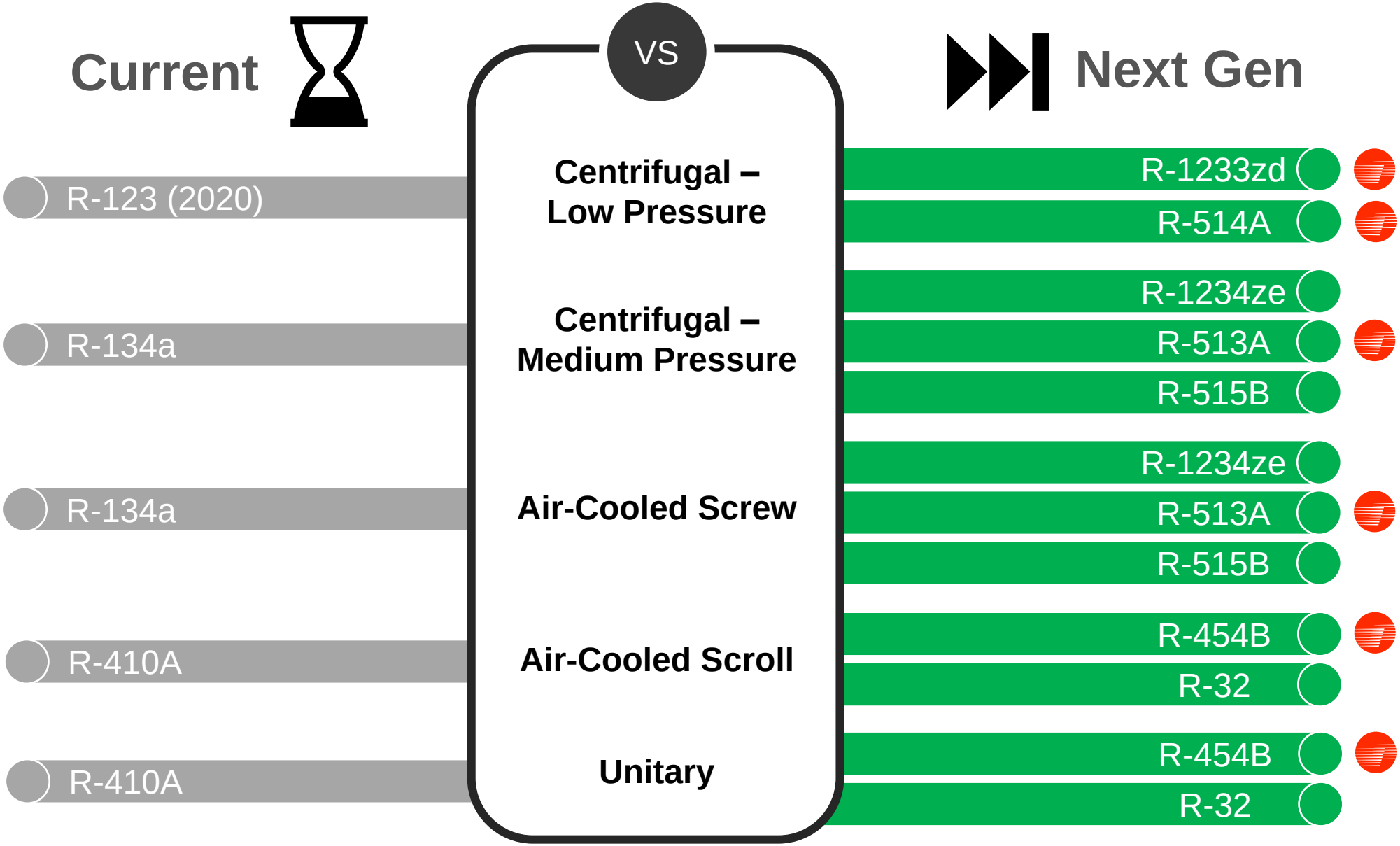
Sustainability, Decarbonization, & Electrification



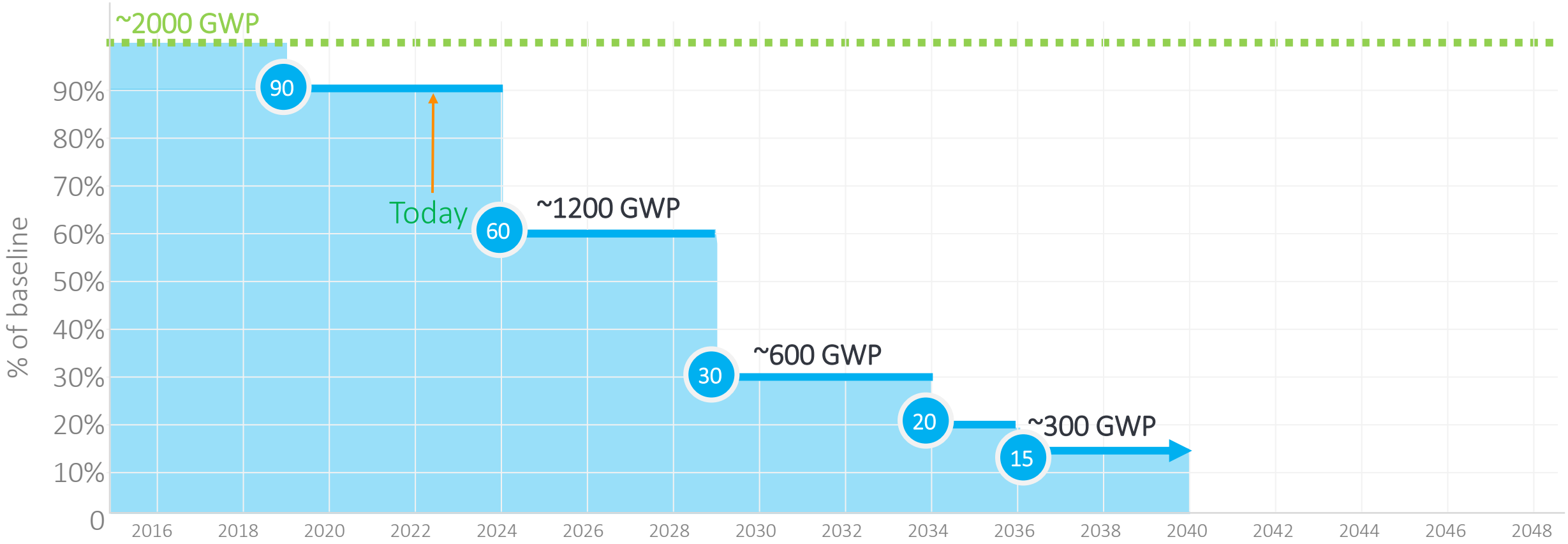
PROJECT DRAWDOWN

73.7-141.2
GIGATONS
CO2 Equivalent reduced/ sequestered (2020-2050)

Refrigerant Comparison – North America



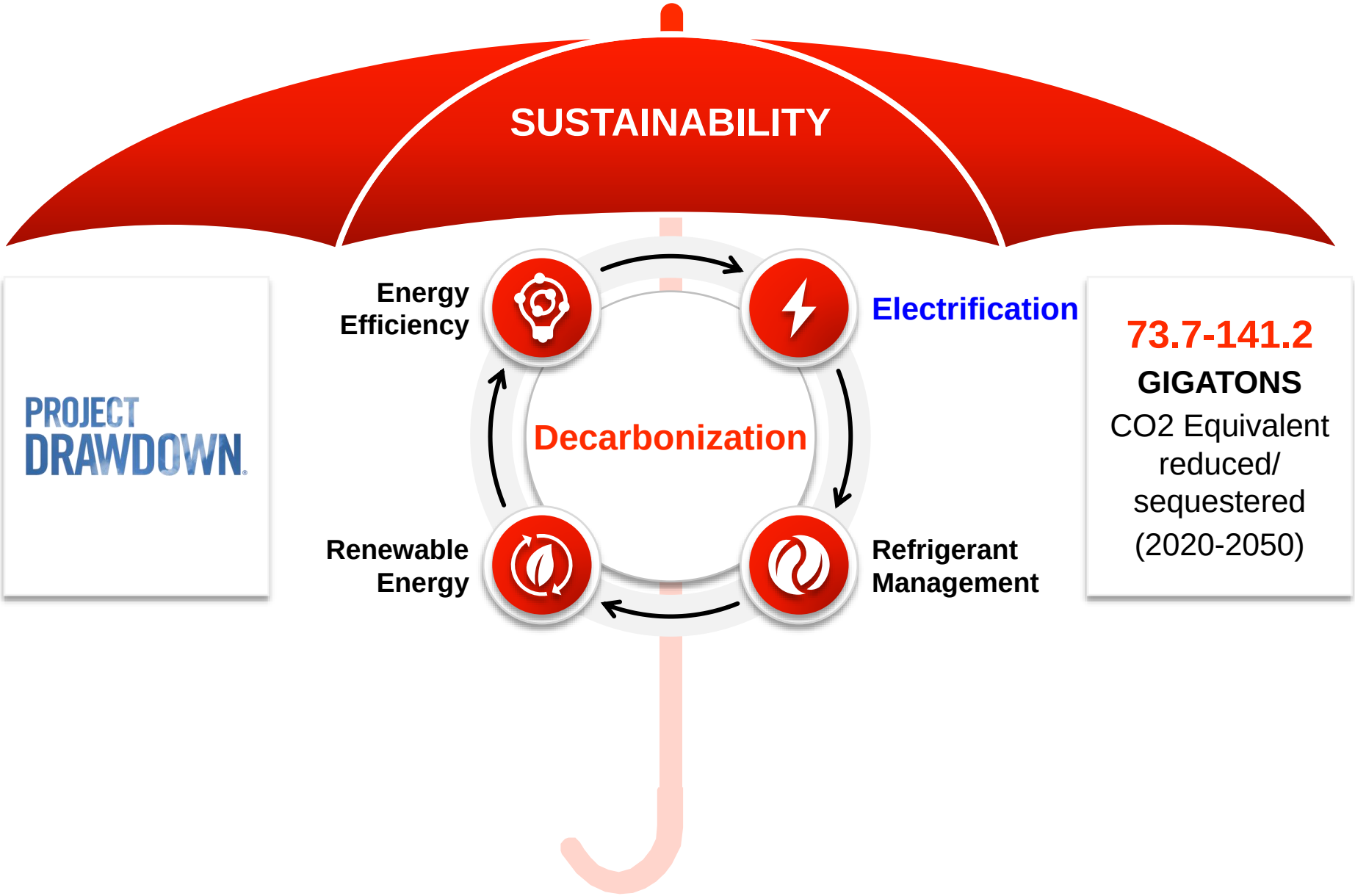
Closer Look - Developed Nations – GWP Cap and Phase Down Details



Kigali Phase-Down of HFCs starting in 2019 for Developed Nations
USA (AIM Act) – Starting ↓10% 2022 then ↓40% by 2024

AIM (American Innovation and Manufacturing) Act – Enacted Dec 2020

Sustainability, Decarbonization, & Electrification



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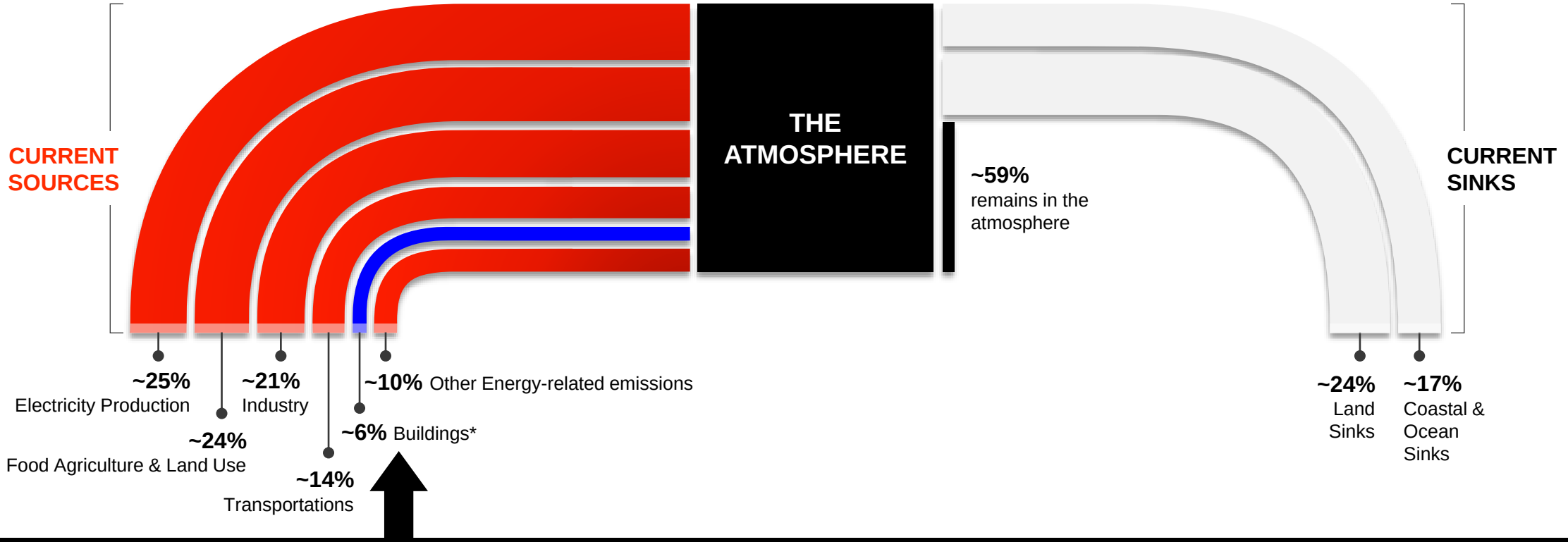
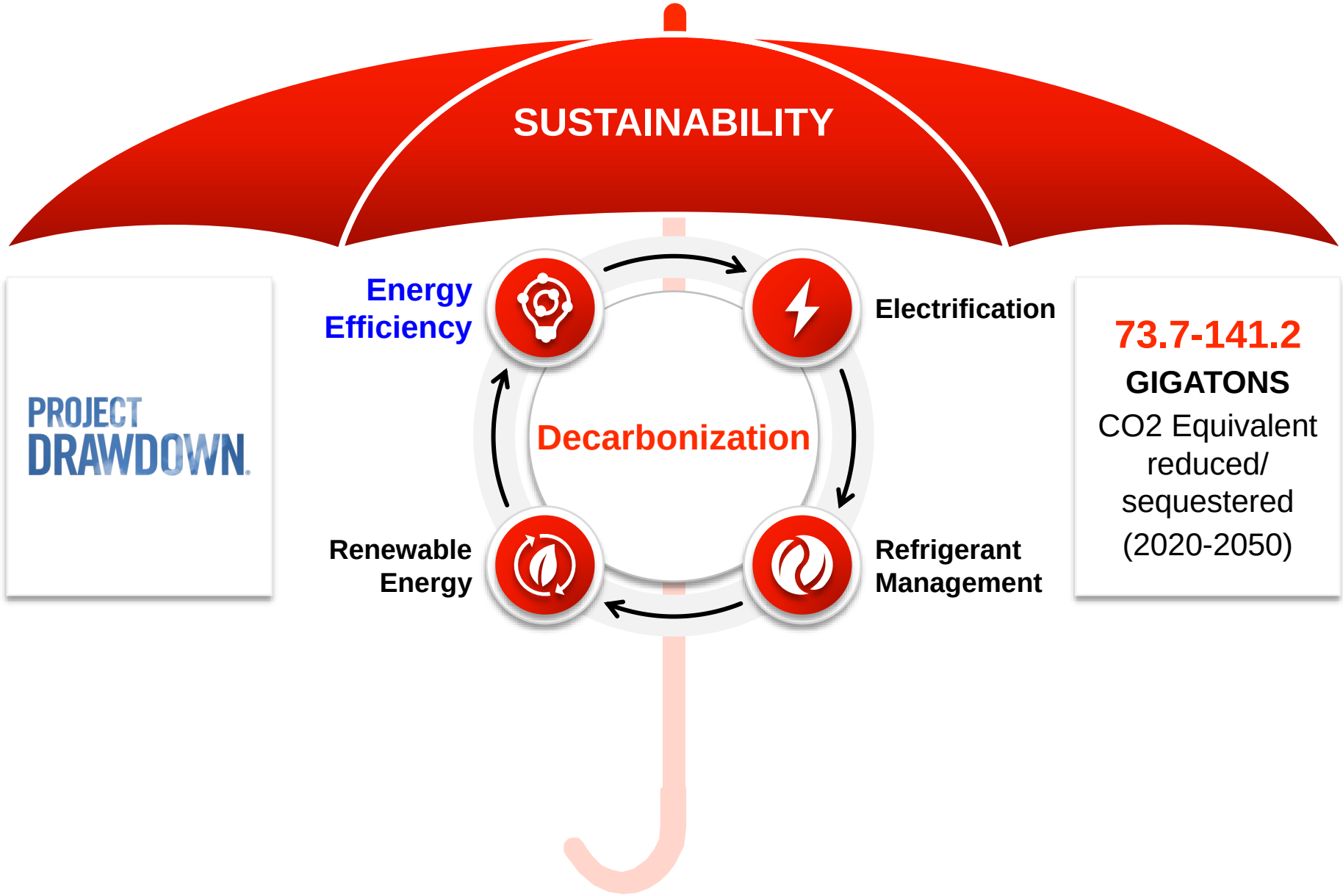
Sources and Sinks



Comfort space heating accounts for 6% of GHG worldwide; early estimates show that electrifying our comfort space heating infrastructure would reduce GHG by 4%*

*Project Drawdown

Sustainability, Decarbonization, & Electrification



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The Complete Package

SELECTION and CONFIGURATION TOOLS

Trace 3D Plus

Design Assist

Full Range of Design Tools to Improve Productivity and Outcomes

INDUSTRY LEADING EQUIPMENT

Best-in-class Energy Efficiency

Next Generation Low-GWP Refrigerants

Electrified Space or Industrial Heating

Maximum Comfort & Indoor Environmental Quality

SYSTEM-LEVEL ENERGY EFFICIENCY SOLUTIONS

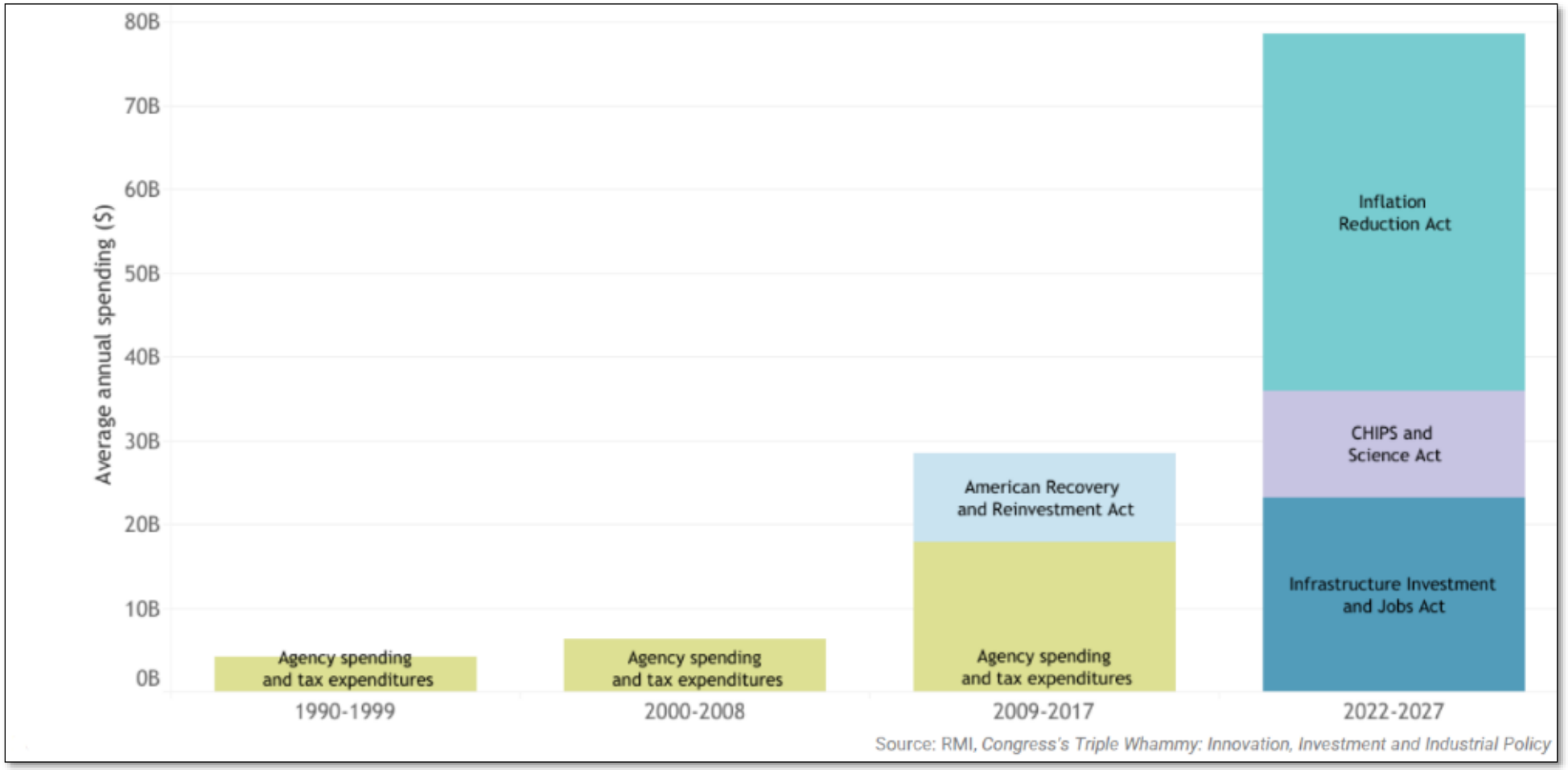
Automation System for Real-Time Response

Demand Management and Shifting via Thermal & Electric Storage

Renewable Energy Investment and Procurement Strategy

Historical Federal Investment in Clean Energy Technologies

- Over the next decade, spending on climate will more than triple historic levels based on federal appropriations and authorizations dedicated to clean energy technologies.



Learn more about these investments here: https://rmi.org/climate-innovation-investment-and-industrial-policy/

Pertinent Rebates, Tax Incentives & Funding for the Commercial Market

$30.5B+

To **boost U.S. production to support building electrification**
(incl. energy storage & heat pumps)

$1B+

In grants for **local gov’ts to modernize commercial &** residential buildings to meet energy codes

Tax Incentives

To expand **tax deductions** for **Energy Efficiency** & **Inv. Tax Credits for Electrification**
(incl. thermal storage & heat pumps)

$30B

To transition states & electric utilities to clean electricity

$3.42B

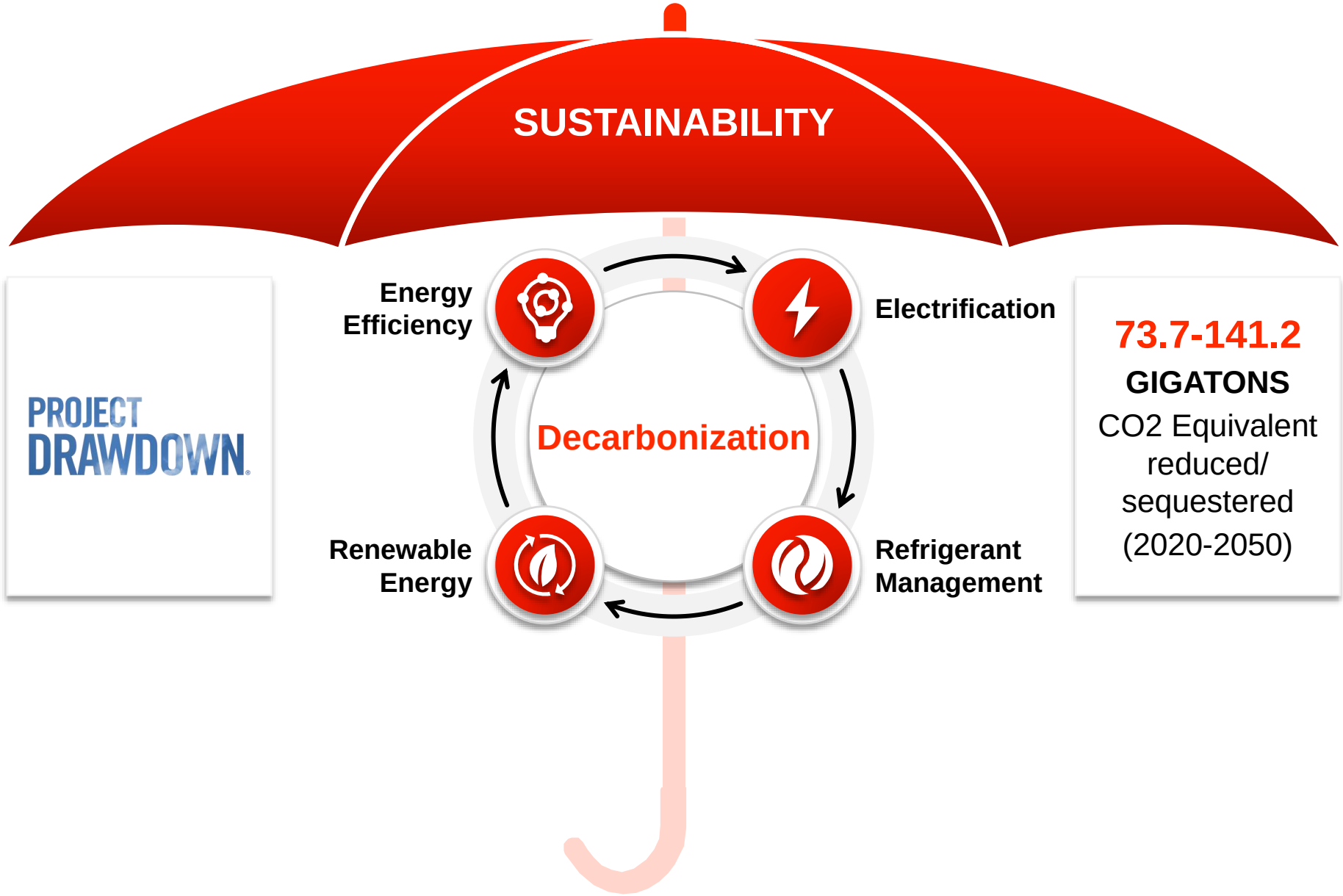
To decarbonize federal buildings through construction or retrofit

$50M+

To reduce air pollutants in schools

Many of these programs aren’t created yet; Impacts to be determined

Sustainability, Decarbonization, & Electrification



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Thank you!
Questions?