From mandate to momentum: Global refrigerant transitions under the Kigali Amendment

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Refrigerants in HVACR industry

Refrigerants are 'invisible materials'

Critical for sustainability in HVACR industry

Circularity extends beyond metals and plastics

Refrigerants also matter for circular economy

Kigali Amendment of the Montreal Protocol

Global frameworks driving refrigerant transition

Refrigerants are essential yet often overlooked components of the circular economy and sustainability efforts in the HVACR industry.

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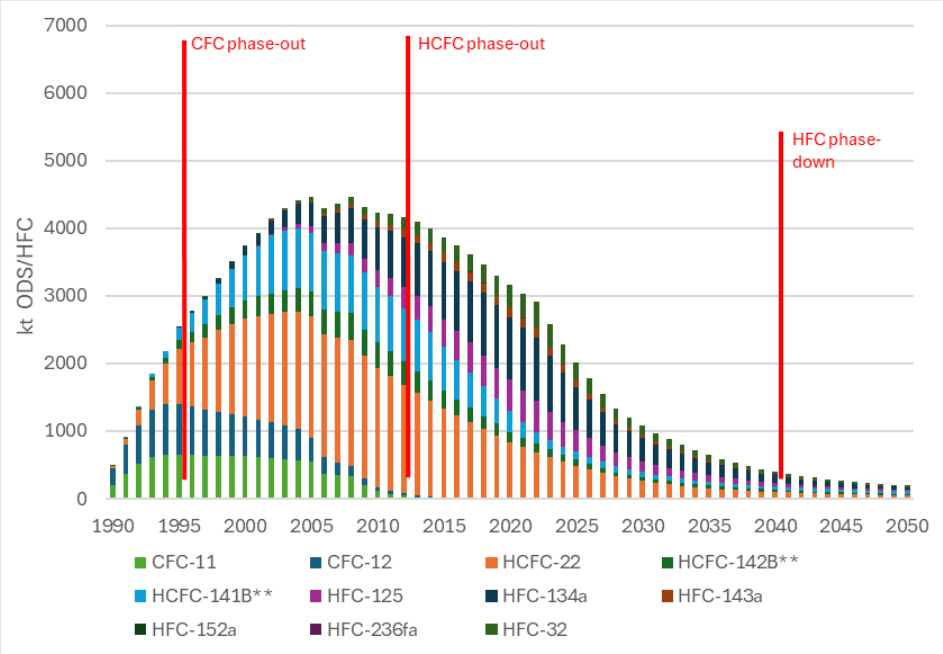
Global Perspective – Where We Are Now

Developed economies Strong regulation, advanced alternatives

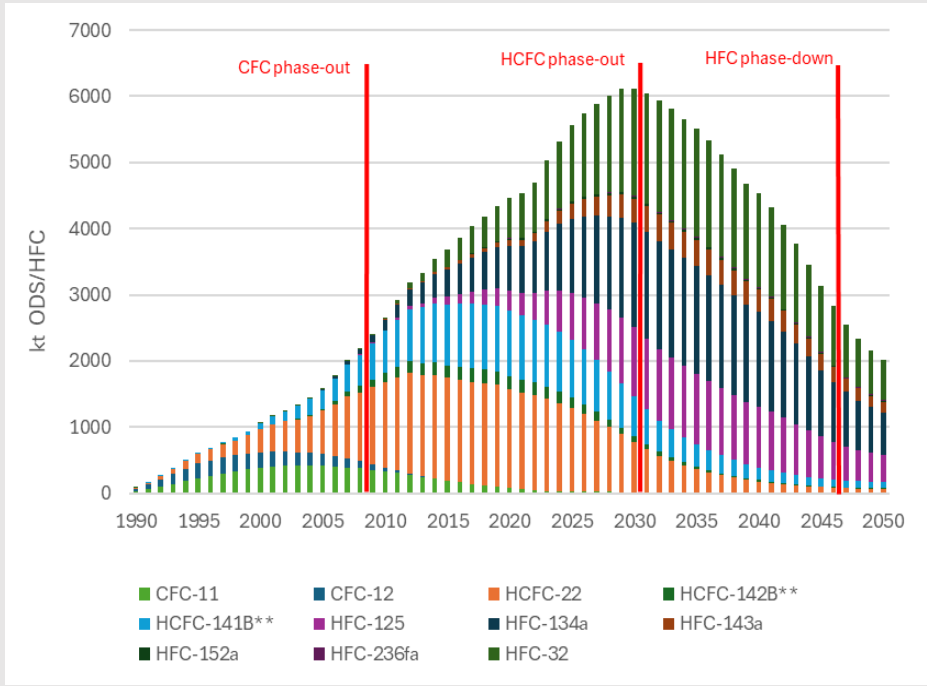


Source

Global Banks of ODS and HFCs,

GIZ 2025

Developing economies Balancing compliance + leapfrogging opportunities



HFC phasedown framework

1987 Montreal Protocol

2006 First F-gas regulation

2015 Second F-gas regulation

2016 Kigali Amendment (2016)

2024 Third F-gas regulation

Circular Refrigerant Management

Recover

Collect and remove refrigerants from existing equipment, such as chillers, air conditioners, and heat pumps, to prevent their release into the atmosphere.

Recycle

Process recovered refrigerants to remove contaminants and restore their original properties, allowing them to be reused in the same or similar equipment.

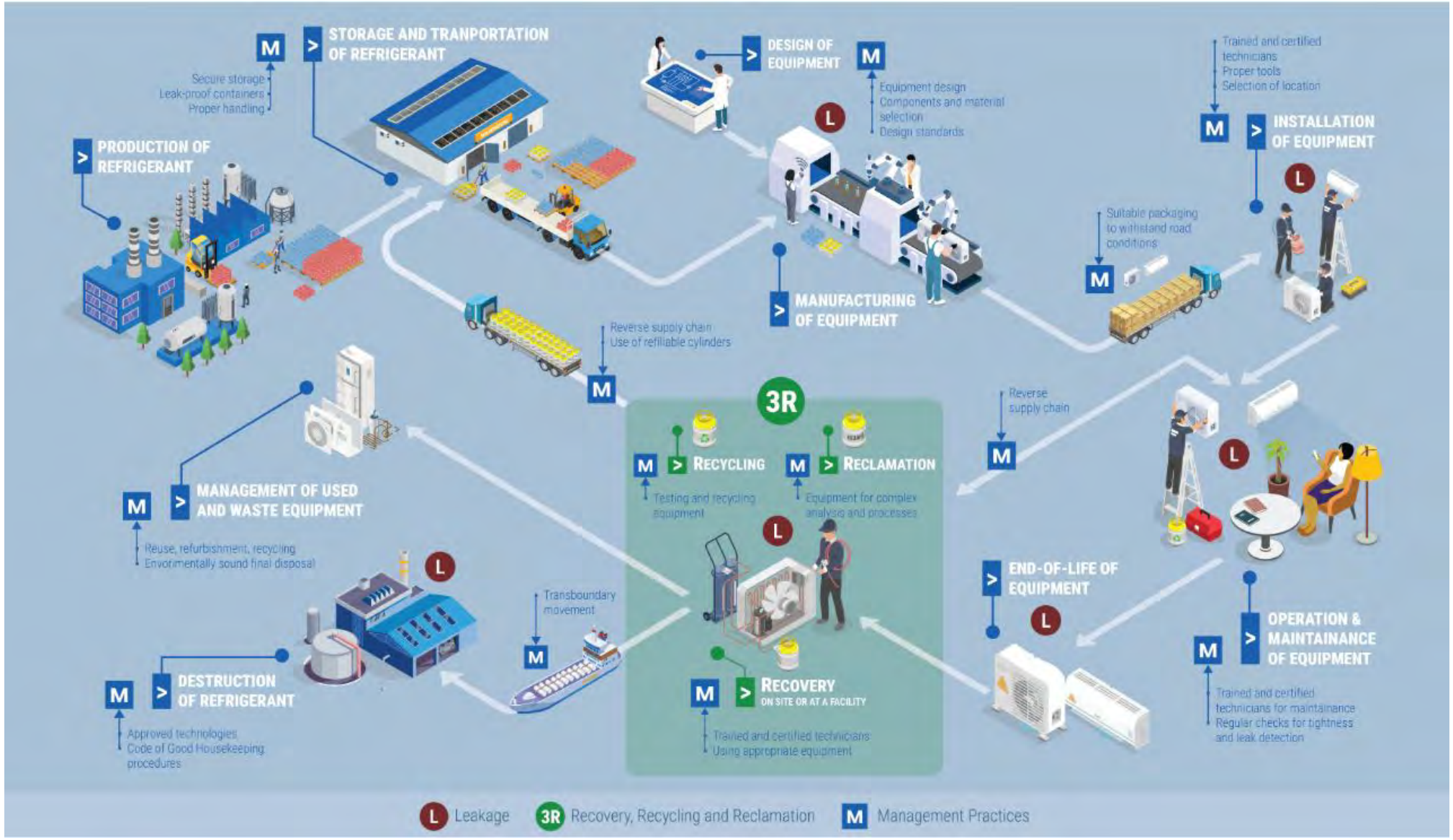
Reclaim/Regenerate

Purify and restore recovered refrigerants to a near-new condition, enabling them to be used as a replacement for newly produced refrigerants.

Responsible Destruction

Ensure the safe and environmentally sound disposal of refrigerants that cannot be recovered, recycled, or reclaimed, preventing their release into the atmosphere.

Life Cycle Refrigerant Management System



Source

Techno Economic Assessment Panel

UNEP, 2024

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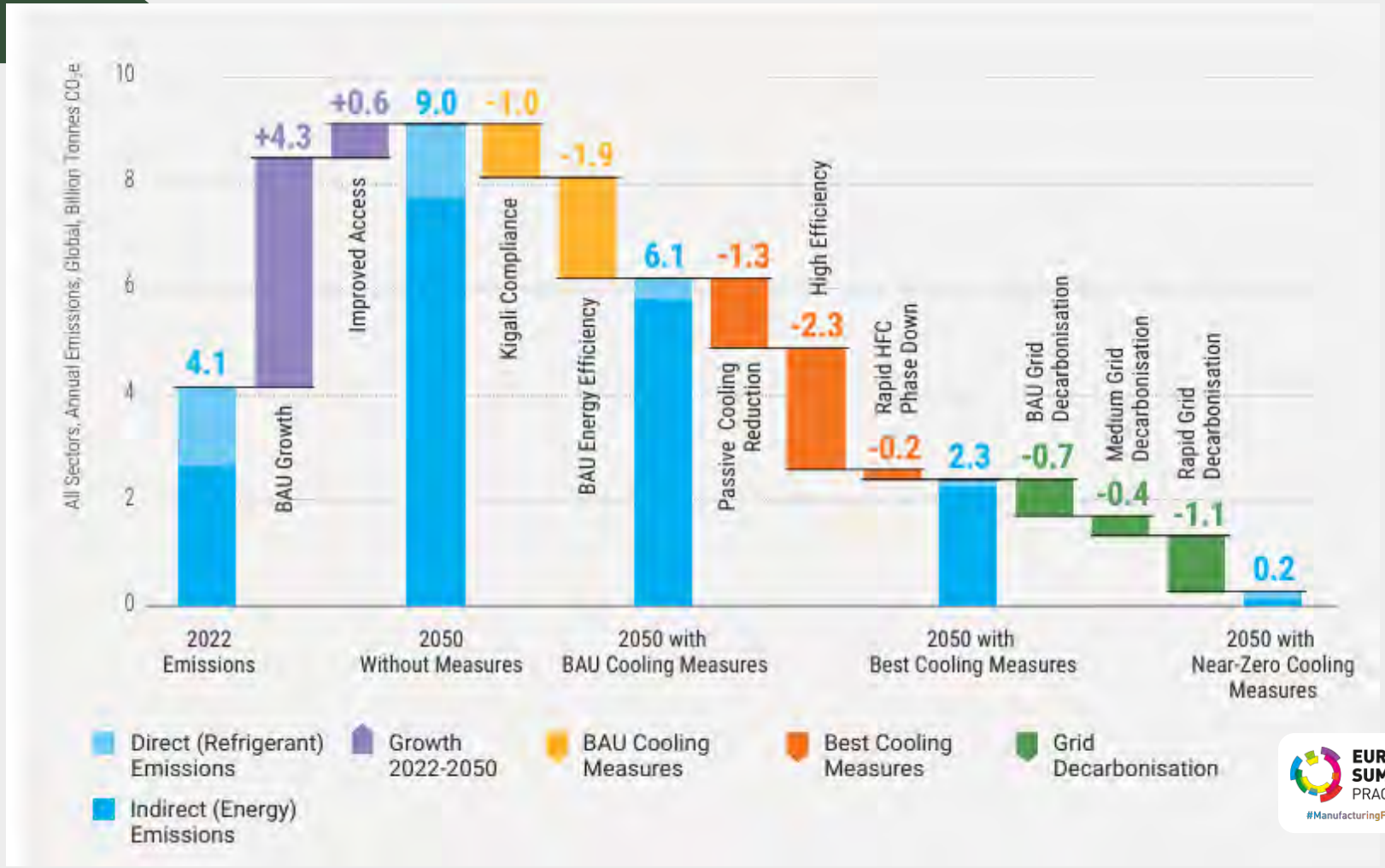
Benefits of Circularity

Climate Mitigation

Resource Efficiency

Resilience



Source

Keeping it chill

UNEP, 2023

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Country/Regional Models – Circularity in Action

European Union

Quotas
Recovery
Destruction obligations
Technician certification
Annual reporting

United States (AIM Act)

Quota allocation,
Sector restrictions
Recovery & recycling programs

Chile

Pilot centers
Techno-economic studies
Incentives for national system

Grenada

Techno-economic studies
National regeneration center launched
Small market proves viability with coordination + financing

Scaling Circular Refrigerant Management

Financing Models	Policy Alignment	Technician Training and Certification	Value Chain Collaboration
Develop innovative financing mechanisms that make recovery and destruction of refrigerants viable in all regions, overcoming economic barriers.	Strengthen policy frameworks to ensure global trade and compliance move in the same direction, promoting circular refrigerant management practices.	Provide ongoing training and certification programs for HVACR technicians, as they are key to implementing effective refrigerant recovery and handling.	Foster closer collaboration across the entire HVACR value chain, including manufacturers, service companies, policymakers, and end-users, to align incentives and drive circular practices.

Key Takeaways

Circular refrigerant management is a cornerstone of sustainability in the HVACR industry

Recovering, recycling, reclaiming/regenerating, and responsibly destroying refrigerants are crucial to mitigating climate impact, improving resource efficiency, and building resilience.

Diverse models of circular refrigerant management are being implemented worldwide

Examples include quota systems, recovery and destruction obligations, and national regeneration centers - showing that this is not just theory, but happening on the ground.

Scaling circular refrigerant management requires financing, policy alignment, and value chain collaboration

Effective models need sustainable financing, aligned regulations, trained technicians, and close cooperation across manufacturers, service providers, policymakers, and end-users.

Circular refrigerant management is a critical part of the HVACR industry's sustainability journey. By embracing this approach, we can build a more resilient, efficient, and innovative sector that contributes to a lower-carbon future.

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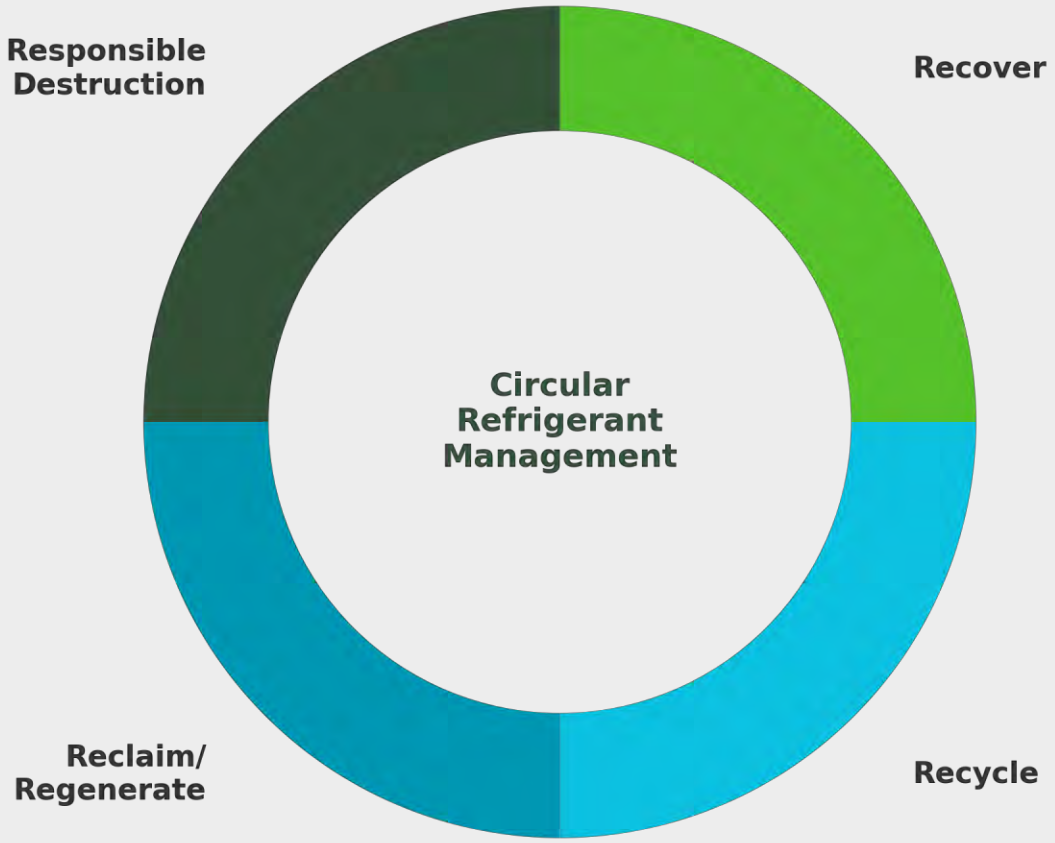
Refrigerants are an integral part of the circularity story, and managing them effectively unlocks innovation, sustainability, and competitiveness for the HVACR industry.

By adopting circular practices like recovery, recycling, reclamation, and responsible destruction, we can mitigate climate impacts, improve resource efficiency, and build resilience for the future.



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