

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.

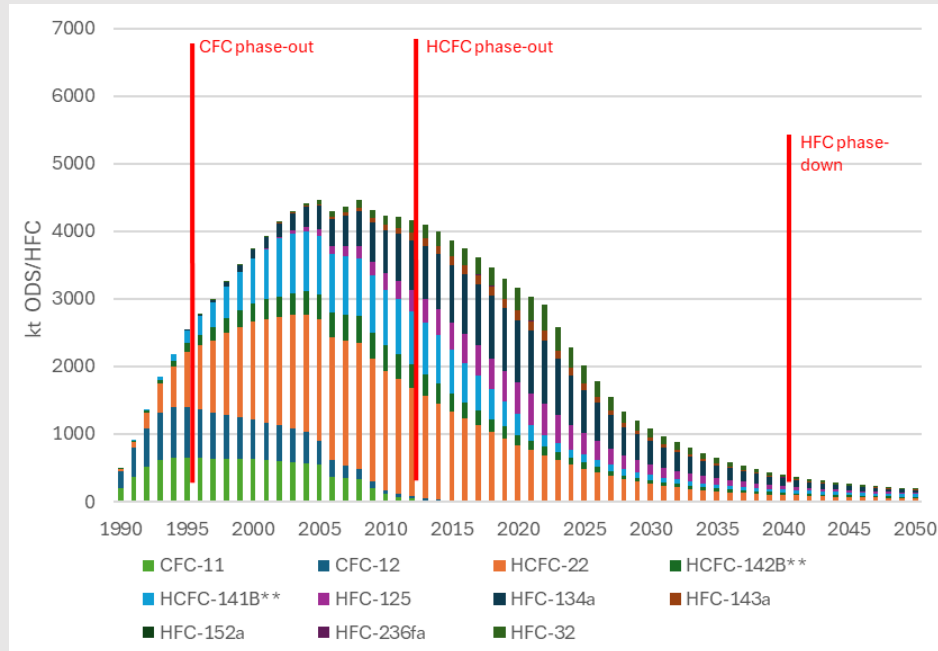
Global Perspective – Where We Are Now

Developed economies

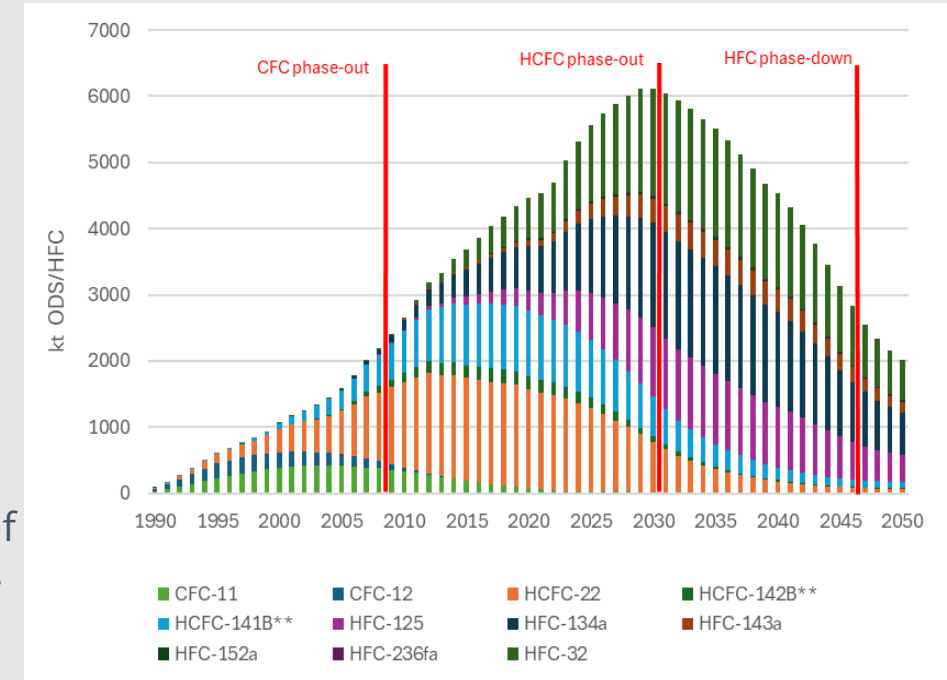
Strong regulation,
advanced alternatives

Developing economies

Balancing compliance +
leapfrogging opportunities



Source
Global Banks of
ODS and HFCs,
GIZ 2025



**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.

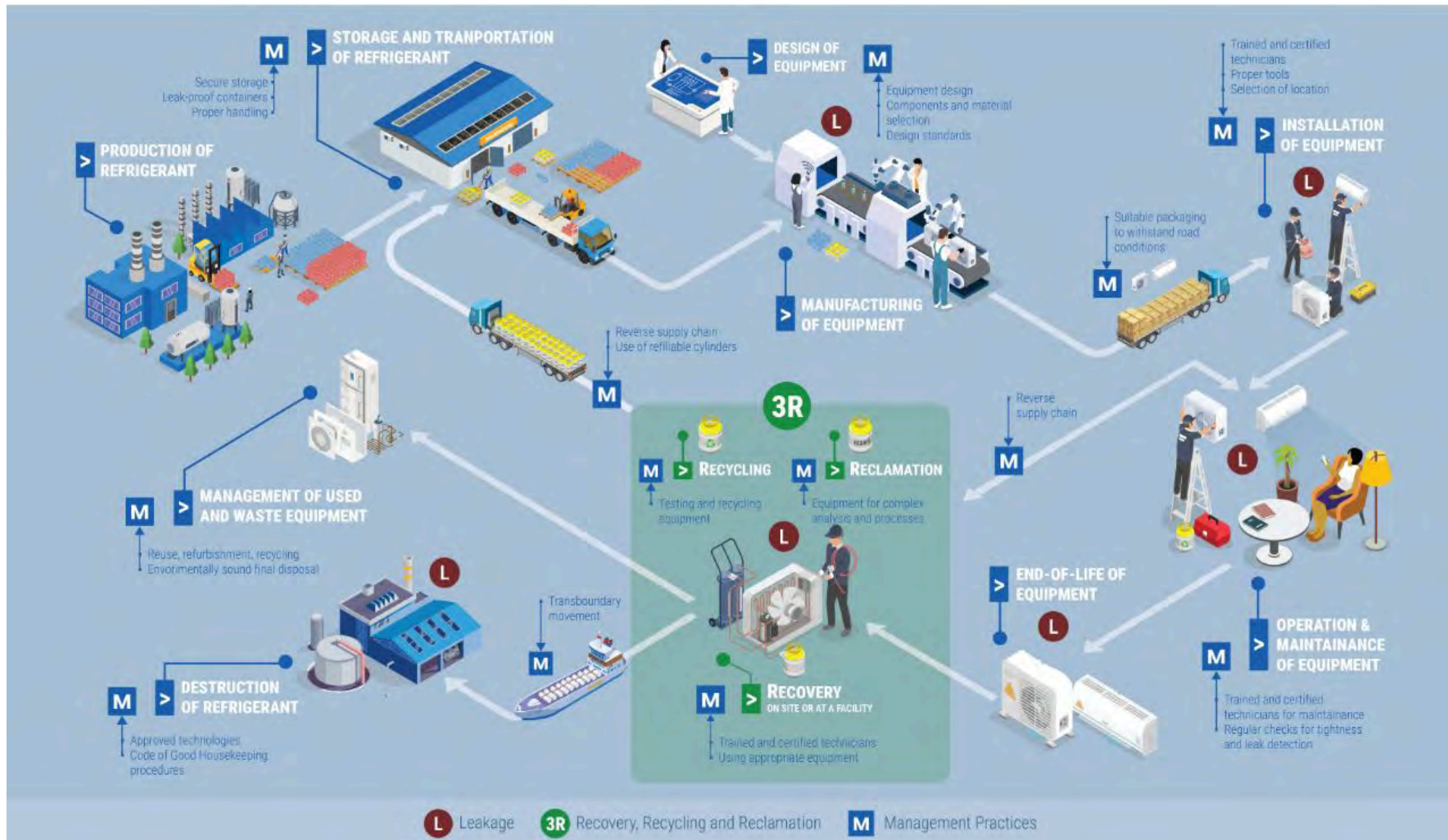
Reclaim/Regenerate

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

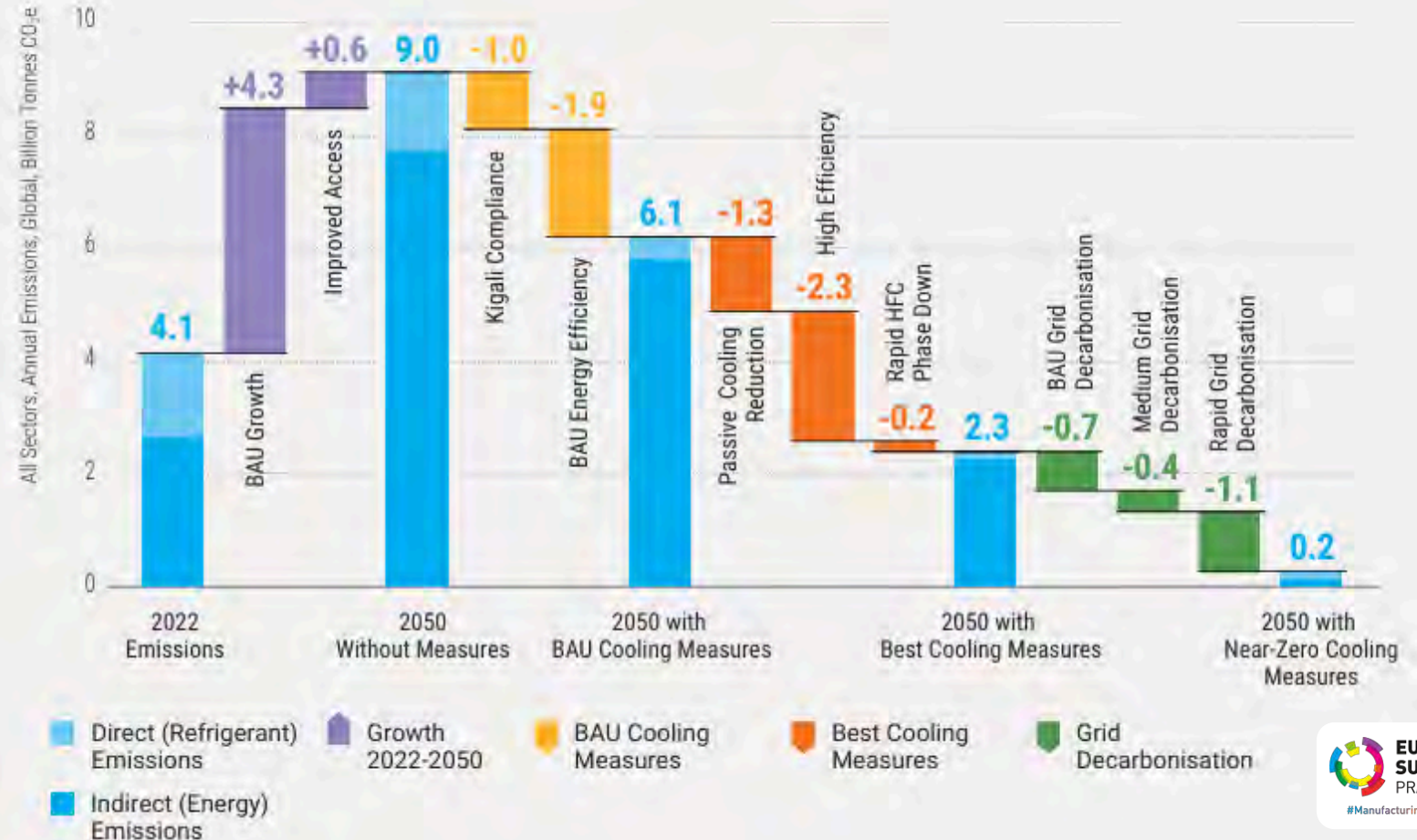
Benefits of Circularity

Climate Mitigation

Resource Efficiency

Resilience

Source
Keeping it chill
UNEP, 2023



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

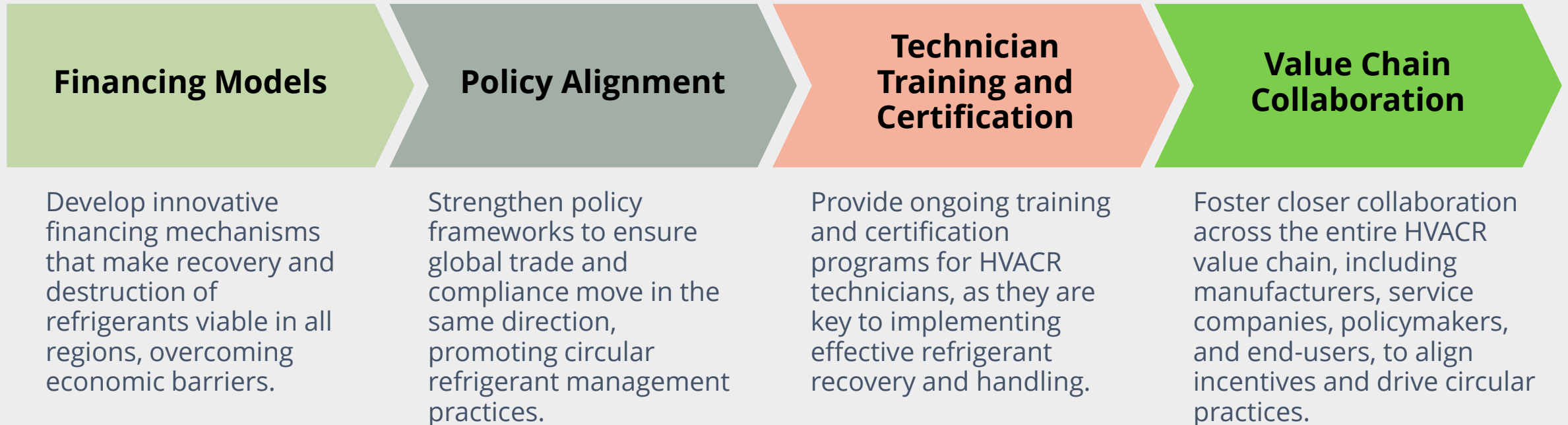
Chile

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



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.

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.

