

TA 6563: Regional Support to build Disease Resilient and Energy efficient Centralized Air-conditioning Systems

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Overview of Refrigerant Management for Centralized Air-conditioning Systems

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Dr. Yashkumar Shukla
ADB TA 6563

Why Refrigerant Management is Important

ADB

DRAWDOWN
ACT UP!

DRAWDOWN SOLUTION #1
Refrigerant Management

DRAWDOWN
ACT UP!

57.75 GIGATONS CO2 EQUIVALENT REDUCED / SEQUESTERED (2020–2050)	\$-629.25 BILLION \$US LIFETIME NET OPERATIONAL SAVINGS
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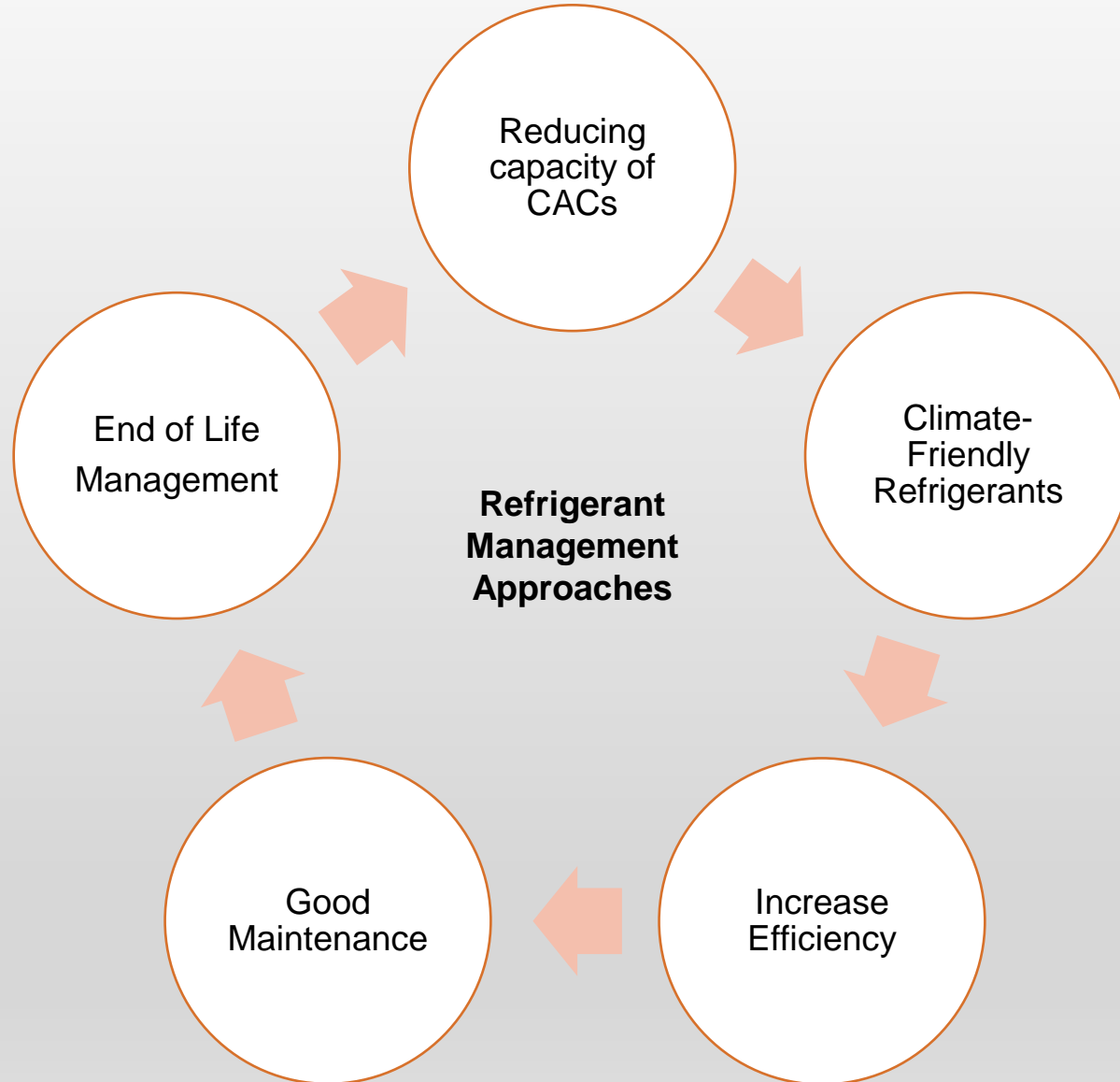
Image Reference: [drawdown_solution1_activity.pdf](#) (insidethegreenhouse.org)

Direct Impact of Refrigerant Management on SDGs



Image Reference: Sustainable Development Goals kick off with start of new year – United Nations Sustainable Development

What is Refrigerant Management in CACs?



Reducing Capacity of CAC Systems

Approaches to minimize the capacity (size) of Centralized Air Conditioning Systems

Envelope Design

- Reduce heating and cooling gains inside buildings
- Wall, Roof, Window Design suitable for climate
- Envelope Leakage

Passive Strategies

- Use of Thermal Mass
- Ventilation or Free Cooling / Heating
- Flexible Design with occupant

Alternate/Hybrid Systems

- Non-refrigerant based low-energy cooling systems (evaporative cooling)
- Hybrid Systems
- Variable Speed Components
- Personalized Systems

Use of Climate-Friendly Refrigerants in CACs

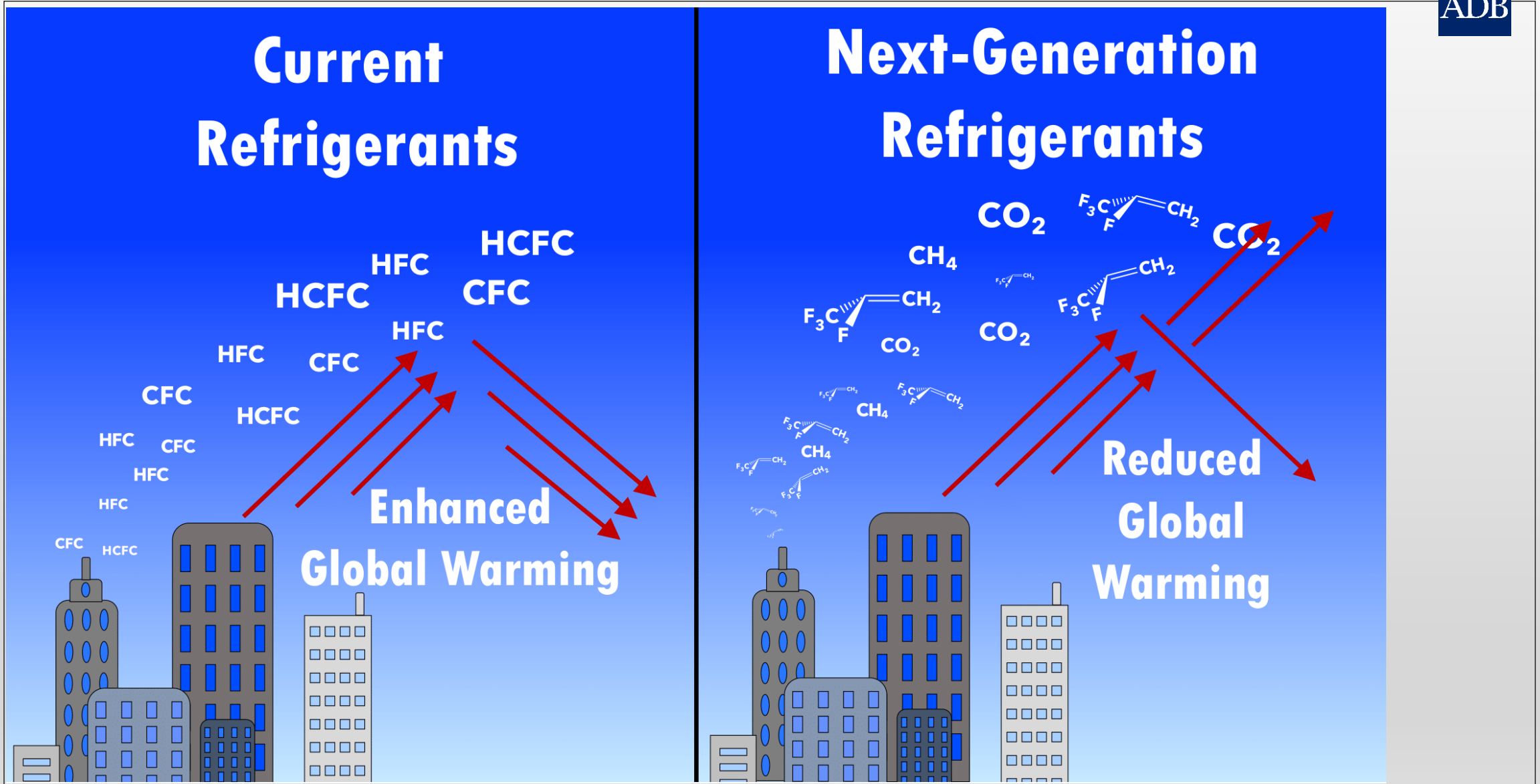


Image Reference: Wolf, Martin & Meier, Adam & Nyland, Bridget & Youn, Sejong & Jacobs, Wendy. (2020). Institutions and Governments Can Slow Climate Change by Regulating and Reducing Halocarbon Refrigerant Use. MIT Science Policy Review. 1. 39-43. 10.38105/spr.575mrlgdjw.

Hydrofluorocarbons Phase-Down Timeline - Kigali

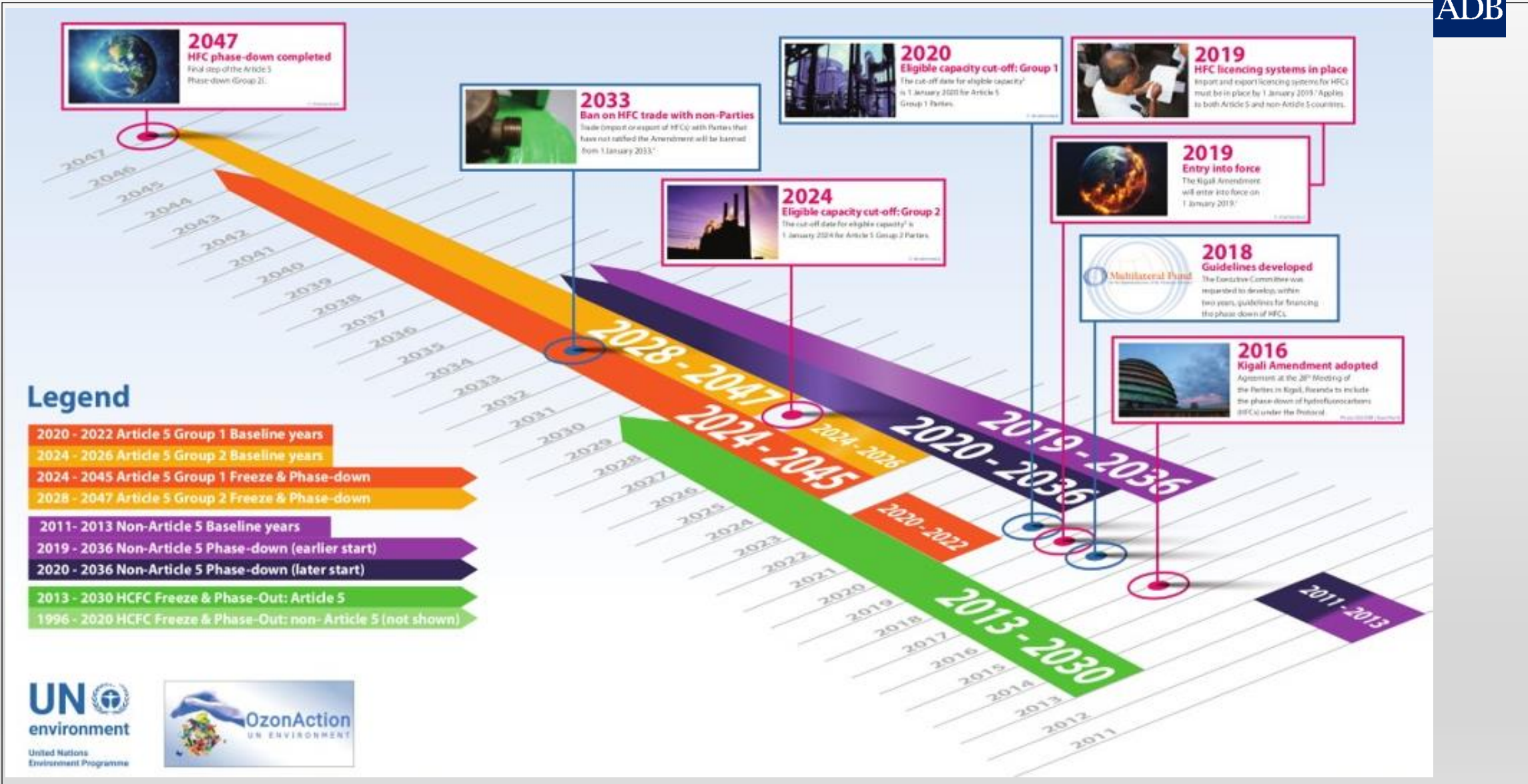
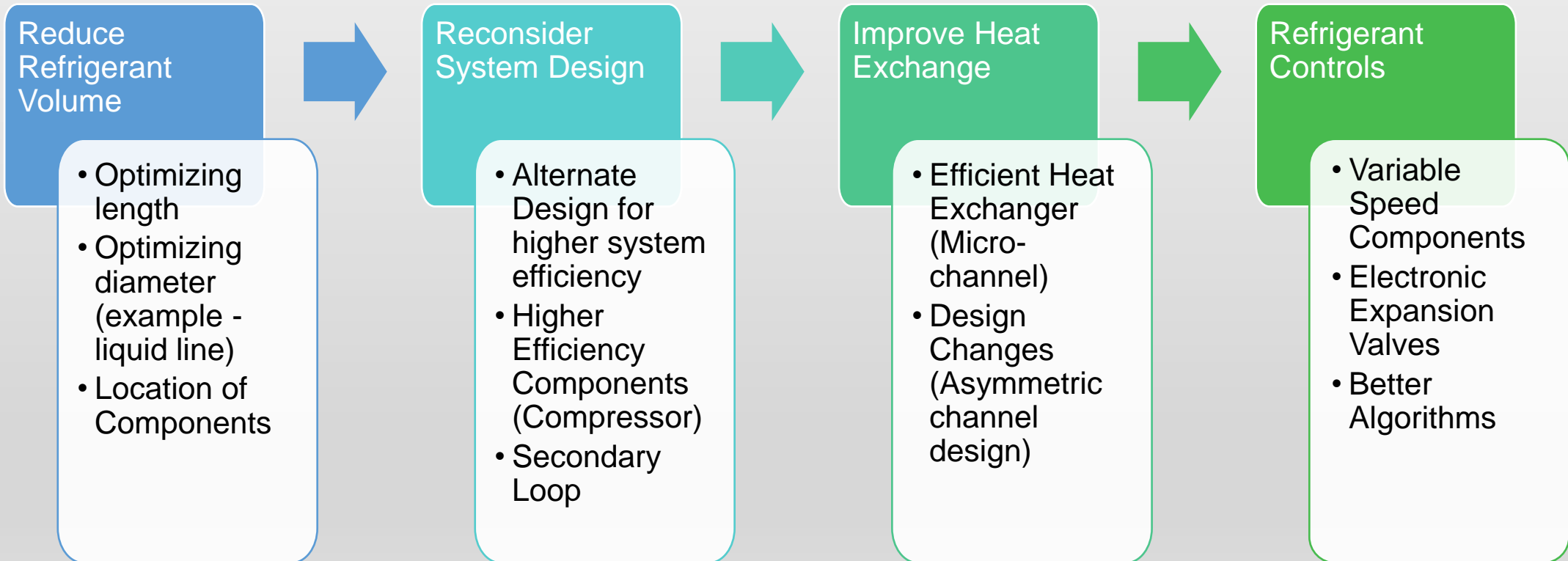


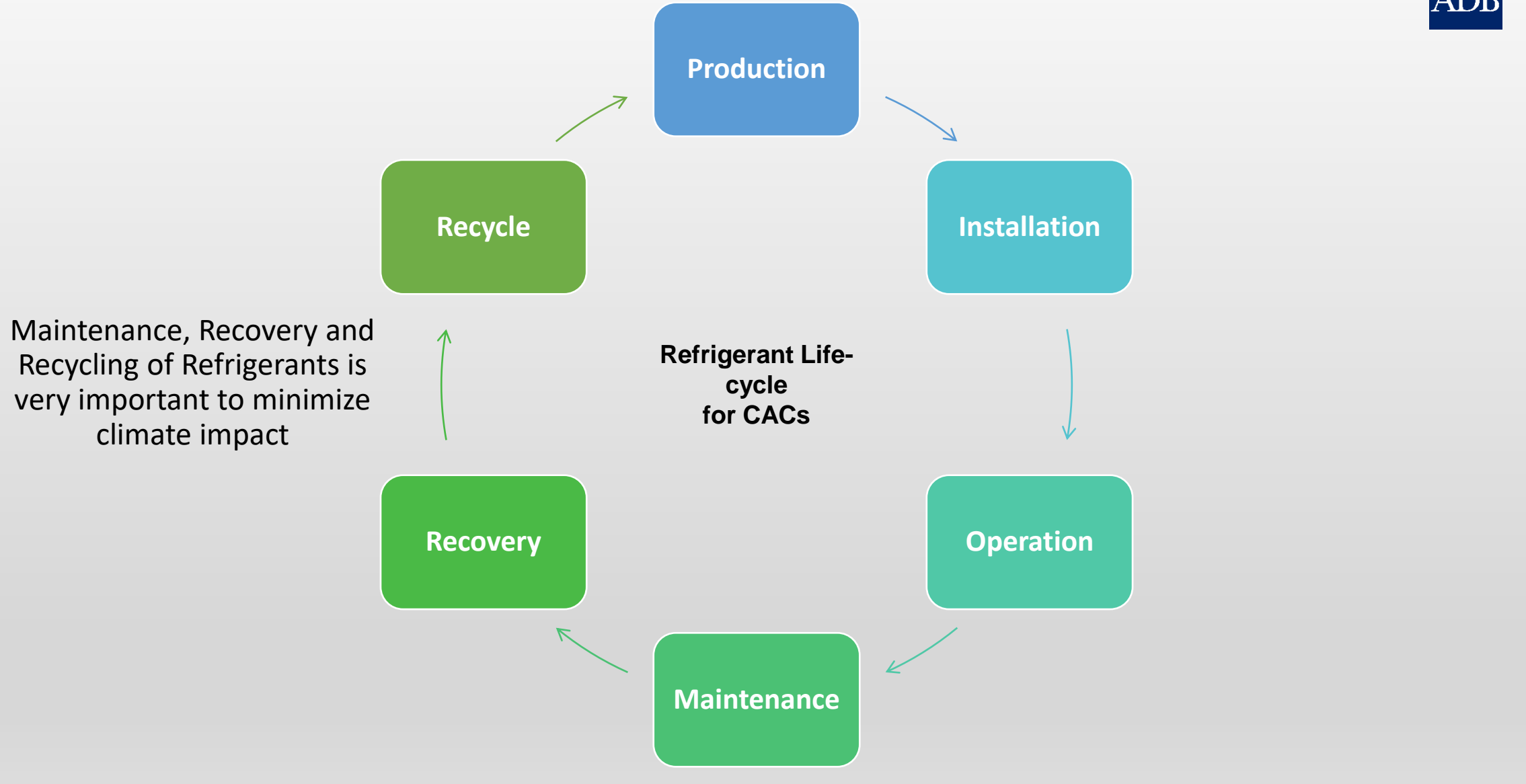
Image Reference: About Montreal Protocol (unep.org)

Increasing Refrigeration Efficiency

Approaches to reduce refrigerant volume in Refrigeration Systems



Refrigerant Life-Cycle in CACs

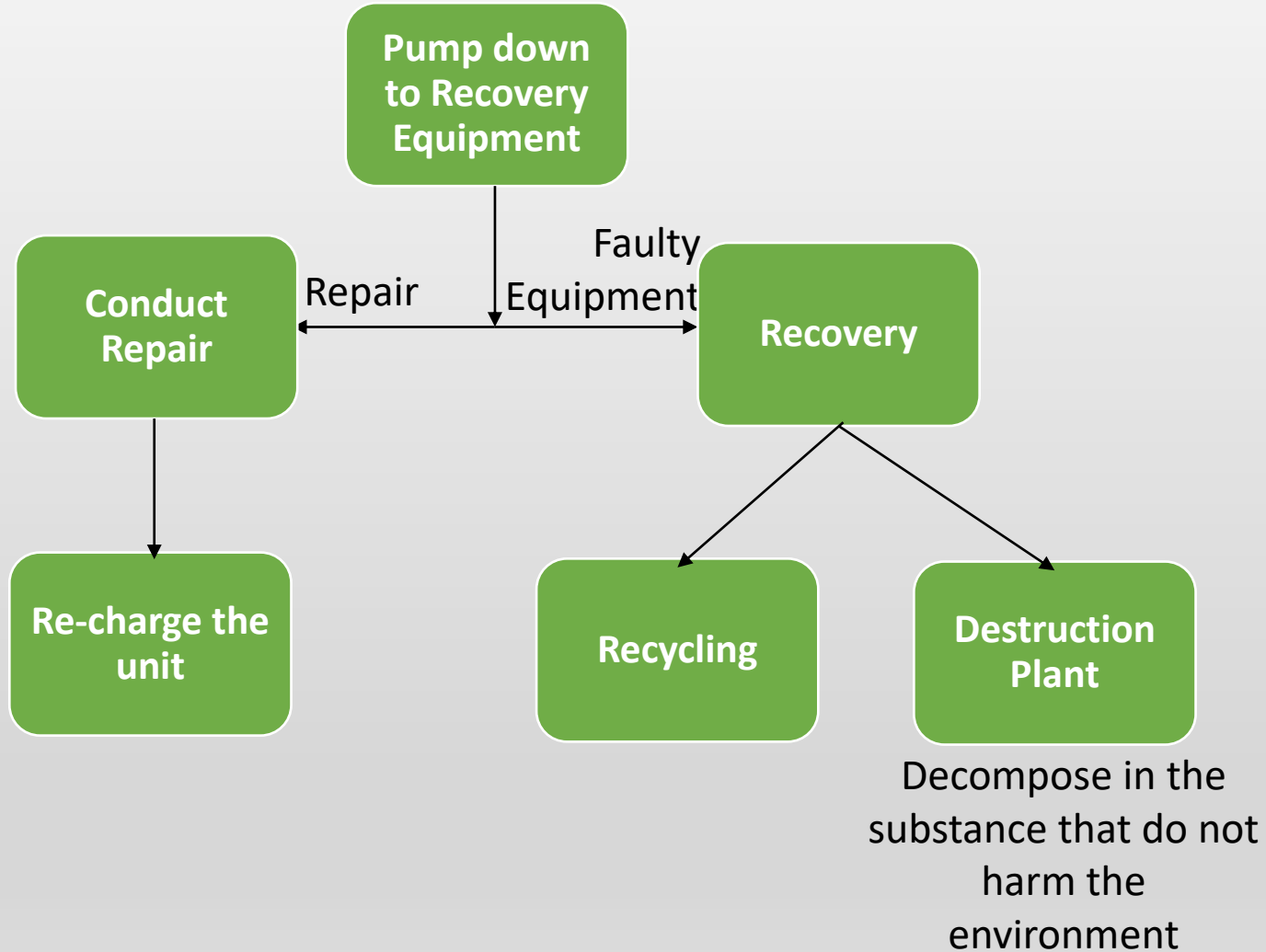


Reducing Leakage Rate in CACs through Maintenance



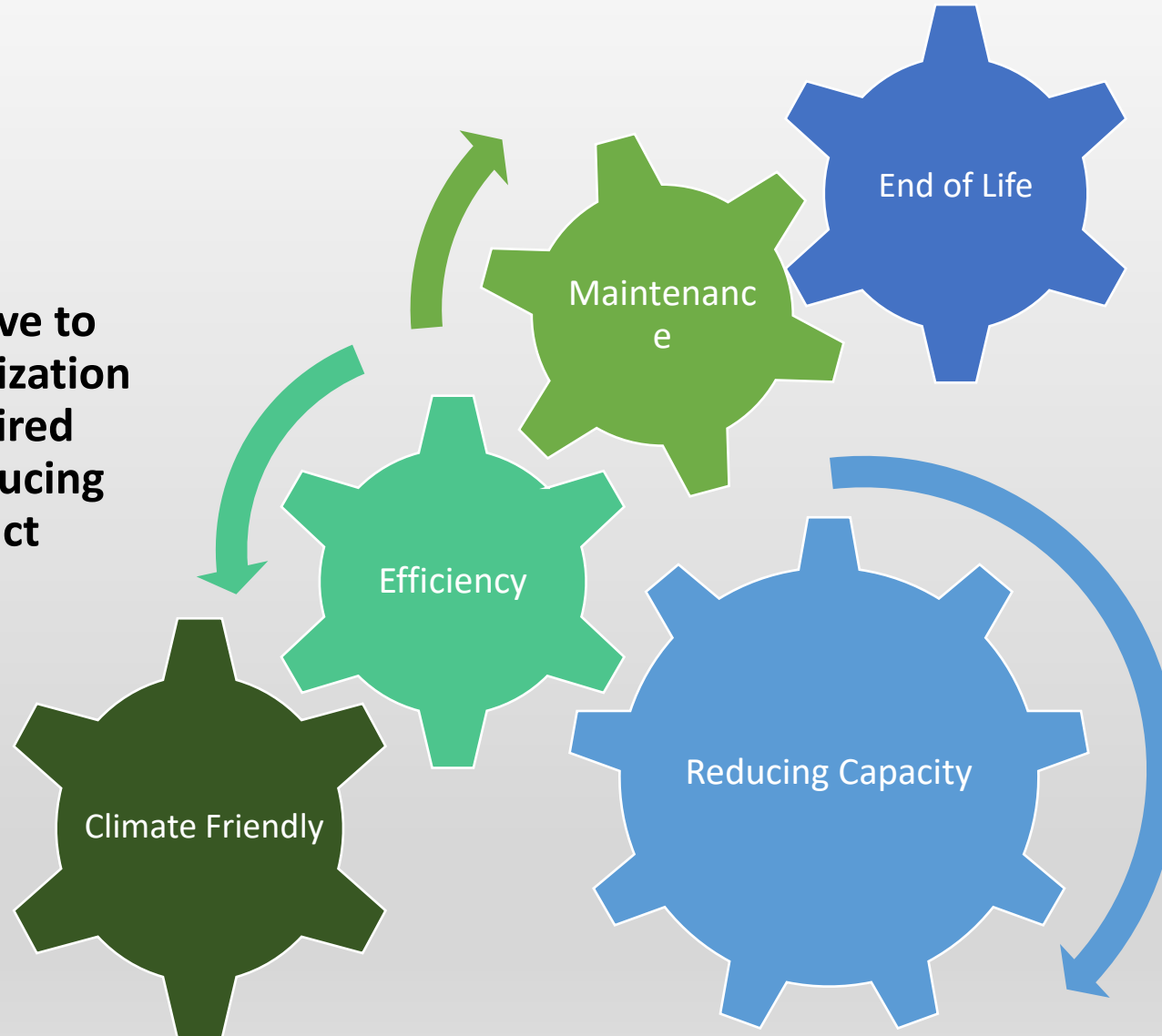
Key Performance Indicators:
Leak Rates (%)
Identification
Repair Time
Responses Time

Recovery and Destruction of Refrigerants for CACs



Refrigerant Management in CACs

All elements have to work in synchronization to achieve desired outcome on reducing climate impact



Thank you

Dr. Yashkumar Shukla, ADB TA 6563