



UNITED NATIONS  
INDUSTRIAL DEVELOPMENT ORGANIZATION  
Progress by innovation



Vienna Convention  
**MONTREAL PROTOCOL**



**Multilateral  
Fund**  
for the  
Implementation of  
the Montreal Protocol



# SUSTAINABLE COOLING FORUM

8-10 April 2026 | Vienna, Austria



International Institute for  
Applied Systems Analysis



INSTITUT INTERNATIONAL DU FROID  
INTERNATIONAL INSTITUTE OF REFRIGERATION



**Speakers' biographies**



**Agenda**



UNITED NATIONS  
INDUSTRIAL DEVELOPMENT ORGANIZATION

Progress by innovation



SUSTAINABLE  
COOLING  
FORUM



## Session 5

Business model innovation

## SESSION 5: Business model innovation



**Mr. Oluyomi Banjo**  
UNIDO



**Ms. Ayse Frey**  
Energy Changes



**Mr. Krzysztof Grzegorzczak**  
PROZON



**Mr. Dimitris Karamitsos**  
BASE



UNITED NATIONS  
INDUSTRIAL DEVELOPMENT ORGANIZATION

Progress by innovation



## Circularity in cooling

Collection, reclamation and sound management of used and waste refrigerants

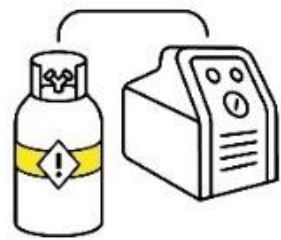
**PROZON**

THE FOUNDATION FOR CLIMATE PROTECTION

## SESSION 5: Business Model Innovation

### Definitions

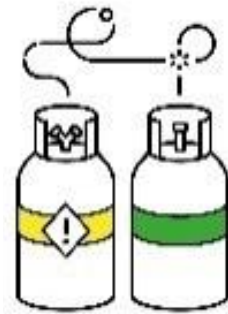
**REGULATION (EU) No 517/2014 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 April 2014 on fluorinated greenhouse gases and repealing Regulation (EC) No 842/2006**



#### Recovery

“means the collection and storage of fluorinated greenhouse gases from products, including containers, and equipment during maintenance or servicing or prior to the disposal of the products or equipment;”

**Evacuation of refrigerant from AC or HP or refrigeration unit**



#### Reclamation

“means the reprocessing of a recovered fluorinated greenhouse gas in order to match the equivalent performance of a virgin substance, taking into account its intended use;”

**Removing impurities above AHRI 700 standards**

RECYCLING

#### Recycling

“recycling’ means the reuse of a recovered fluorinated greenhouse gas following a basic cleaning process;”

**Basic cleaning process** (not tested result)

#### Destruction

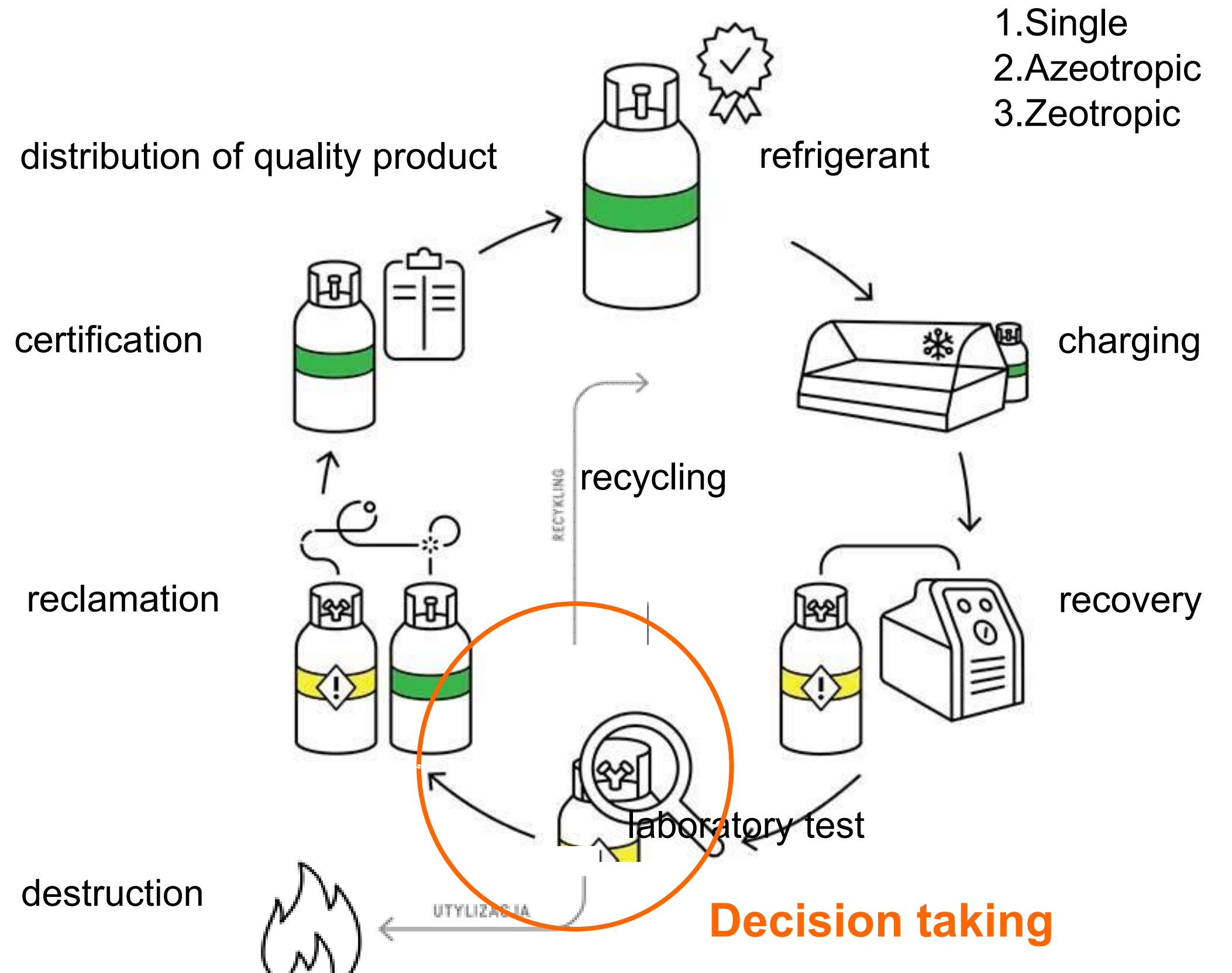
“means the process of permanently transforming or decomposing all or most of a fluorinated greenhouse gas into one or more stable substances that are not fluorinated greenhouse gases”, **Incineration or**

**plasma destruction**



## SESSION 5: Business Model Innovation

### Life-Cycle Refrigerants Management



## SESSION 5: Business Model Innovation

### **PROZON Foundation. The Beginning in Poland**

#### **The main objective was to meet the commitment of The Montreal Protocol to have a 3R network (1996)**

- The Recovery, Recycling, and Reclamation network of service companies was created (3R)
- Reclamation Center was created with a specialized laboratory
- More than 1000 contracts with R&AC services were signed
- 2500 RAC personnel were trained and received the „Green Card” – 1998/1999 r.
- The main financing for the equipment was by Global Environmental Fund (World Bank),

Founders: *Air Products, Linde, Schiessl Polska*



## SESSION 5: Business Model Innovation

### Context of the RRR Model in Poland.

Recovered refrigerants (CFC, HCFC, HFC, HFO) - dangerous waste 14 06 01\*

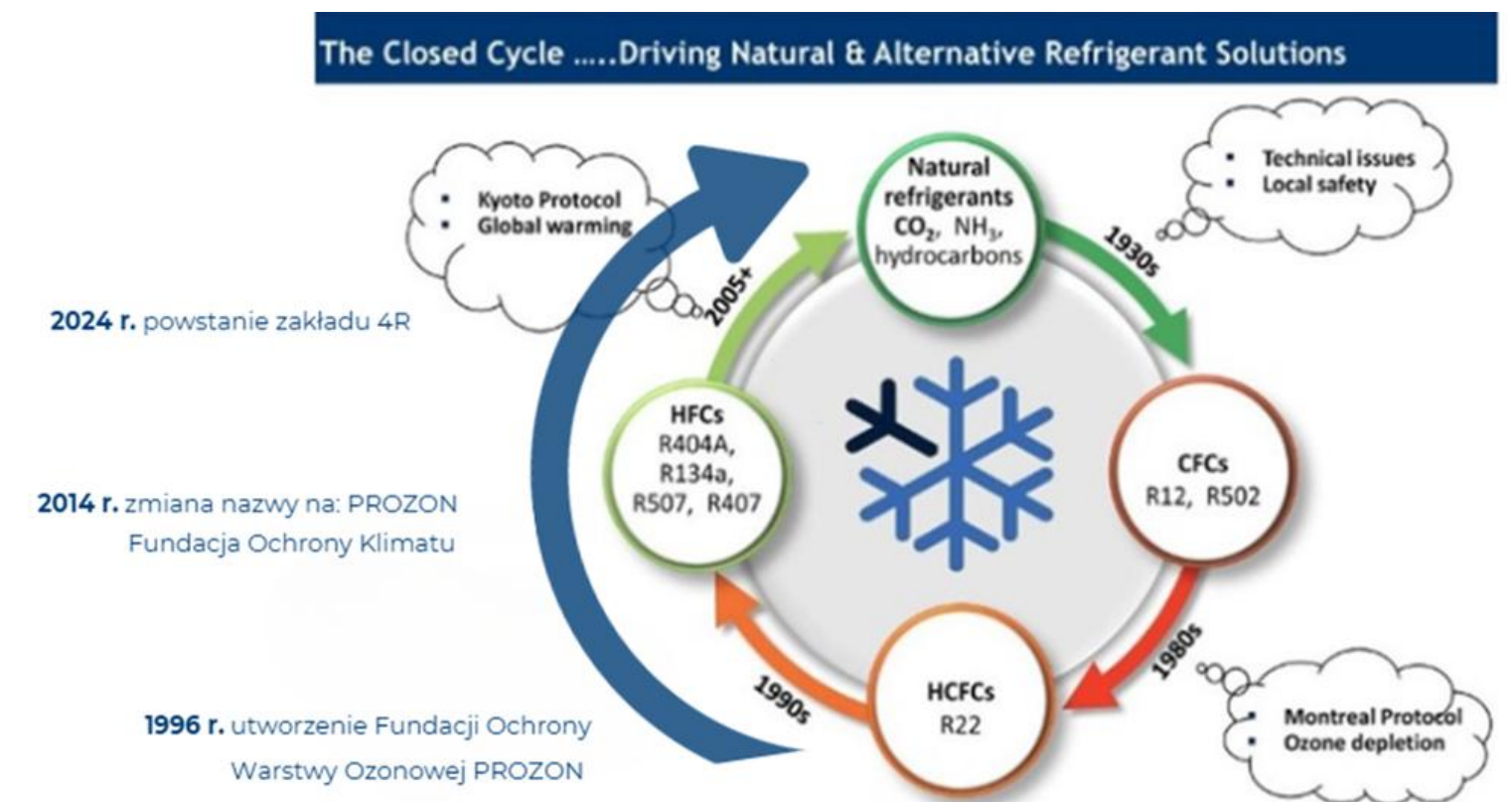
Emission is subject to an environmental fee of EUR 10/kg

Online registration is compulsory for every service activity and F-gas volume change in an RAC installation

The F-gas personnel certification system is in place, compulsory for service technicians

Environmental inspection verifies that companies follow the rules

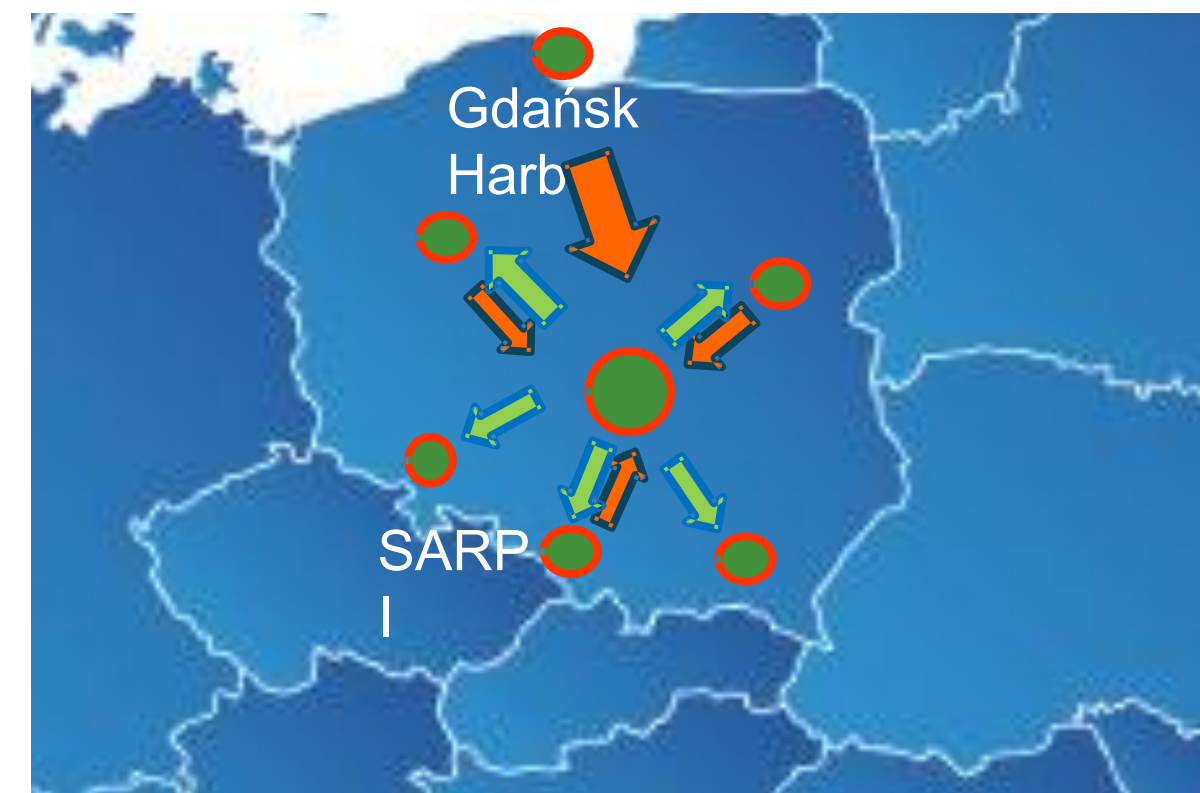
All waste transportation is subject to registration upfront in the waste registry



## SESSION 5: Business Model Innovation

### PROZON Foundation. Model in Poland

- 1.Recovery of refrigerants are based on RAC service companies  
Supported by PROZON's own service teams for large installations
- 1.Collection in central Reclamation Center (RC) in Warsaw  
Supported by 10 collecting points (Schiessl)
- 1.Until F-gas Regulation services pay to RC for the disposal ( EUR 4/kg)  
while the end-user is charged by the service
- 1.Since F-gas Regulation (2014), services are paid for reclaimable F-gases by RC (EUR 0 – 15/kg)
- 2.RC is also providing reclamation services for customer products
- 3.Service companies quite often recycle themselves recovered refrigerants instead of reclaiming



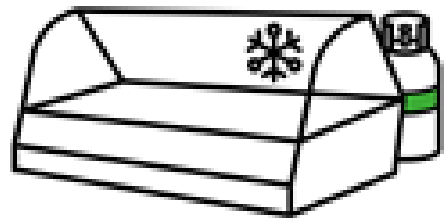
## SESSION 5: Business Model Innovation

### What are the benefits of RRR system

1. Less emission of greenhouse gases
2. Mitigating climate change
3. Protecting the ozone layer
4. Meeting global and local agreements
5. Extra volume of refrigerants without virgin production
6. Extra volume above the quota or licence systems
7. Part of environmental education
8. Recovery of refrigerants is an expression of social responsibility and environmental care.

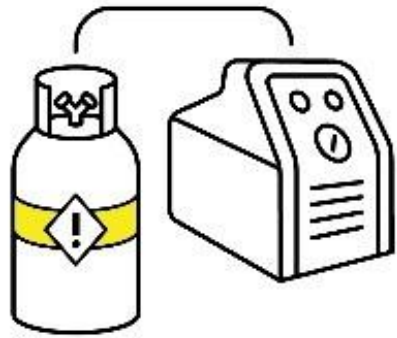


## SESSION 5: Business Model Innovation





## SESSION 5: Business Model Innovation





## SESSION 5: Business Model Innovation



## SESSION 5: Business Model Innovation



## SESSION 5: Business Model Innovation

### Minimum requirements for RRR

Refrigerant Reclaim Center		
Quantity	Description	Purpose
2 unit	Refrigerant Identifier	Verification of incoming refrigerant
10 units	1000 l. storage tanks	Storage of refrigerant for destruction
50 units	27 l. storage cylinders	General storage use
1 Unit	Reclaim Station	Reclaim Station incl filters for 1 year use
1 Unit	Filter Chiller	Accessory for Reclaim Station (high ambient temps)
1 set	Karl-Fisher or Shaw testing eqt.	Moisture testing, other AHRI 700 parameters
1 Unit	Fork Scale 1500 kg	For above Storage Tank
1 Unit	Gas Chromatograph (microGC)	Refrigerant Certification
2 Units	Vac Pumps	Evacuation of cylinders before refilling
4 Units	Recovery Units for HCFC & HFC	Empty cylinders and partly refill
1 Unit	Electric liquid Transfer Pump Including Scale	Cylinders filling to be re-distributed.
2 Sets	Leak detector and accessories	General refrigerant handling including tools
1 off	Installation and Training	Installation and 2 days on site training + study tour
1 off	Transportation costs	DDU Final Destination

## SESSION 5: Business Model Innovation

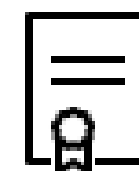
### PROZON The Foundation for Climate Protection

Self-financed, non-government organization (NGO),

An enterprise working in the refrigeration, air-conditioning & energy sector (for 30 years), reporting to the Ministry of Climate and Environment



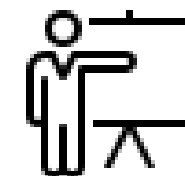
20.000 special cylinders in the market



6300 osób personnel trained for certification



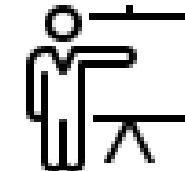
6000 partners



2700 accredited for F-gas certificate



2.500 tons of refrigerants collected



300 accredited for SF<sub>6</sub> certificate



SUSTAINABLE  
**COOLING FORUM**

**Thank you**

Krzysztof Grzegorzczak

PROZON The Foundation for Climate Protection

Warsaw, POLAND

[PROZON@PROZON.ORG.PL](mailto:PROZON@PROZON.ORG.PL)



UNITED NATIONS  
INDUSTRIAL DEVELOPMENT ORGANIZATION

Progress by innovation



SUSTAINABLE  
COOLING  
FORUM

# Demystifying carbon markets: opportunities for ozone depleting substances and HFC

A project developer's perspective



## SESSION 5: Business Model Innovation

### Outline

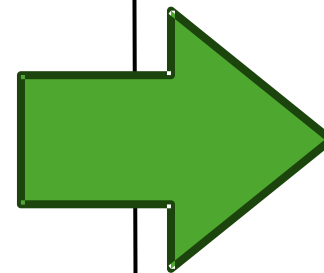
- Setting the context
- About Energy Changes
- What is carbon finance
- Safeguards and integrity
- Refrigerant carbon project types
- Innovative business models
- Closing



## SESSION 5: Business Model Innovation

### The **Challenge:**

- **Refrigerant emissions are an estimated 3–4% of global GHG emissions**
  - Compared to cement (3%), aviation (1.9%), and shipping (1.7%)
- **Cooling demand is rapidly increasing**
- **Strained government budgets** in A5 countries and little financial incentive for LRM practices, especially end-of-life & waste



### The **Opportunity:**

- High-integrity carbon markets are cost-effective pathway for tackling emissions
- **Article 6 of the Paris Agreement** enables high-integrity markets and new innovative LRM business models
- Carbon markets monetize **emissions reductions**, reducing the financial burden on governments
- **Flexible participation:** governments, private sector, or both

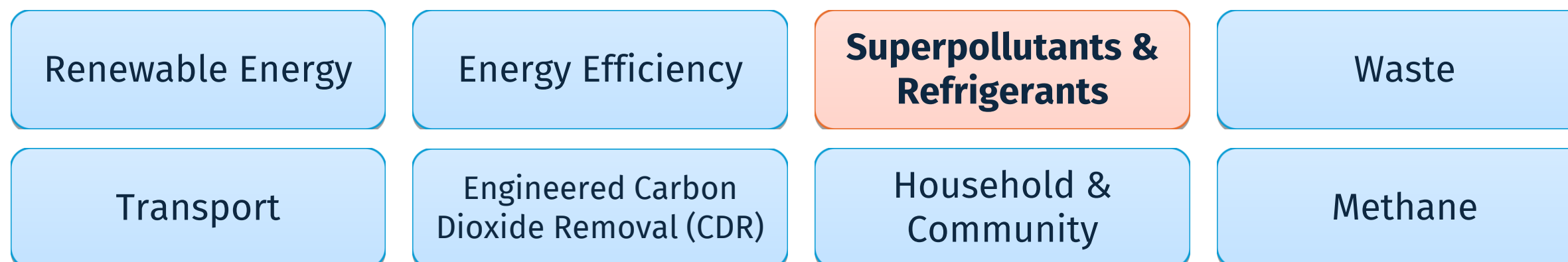
## SESSION 5: Business Model Innovation

### About Energy Changes

- Climate and sustainability advisory and carbon project developer in Vienna
- Founded in 2006, our three core services are:

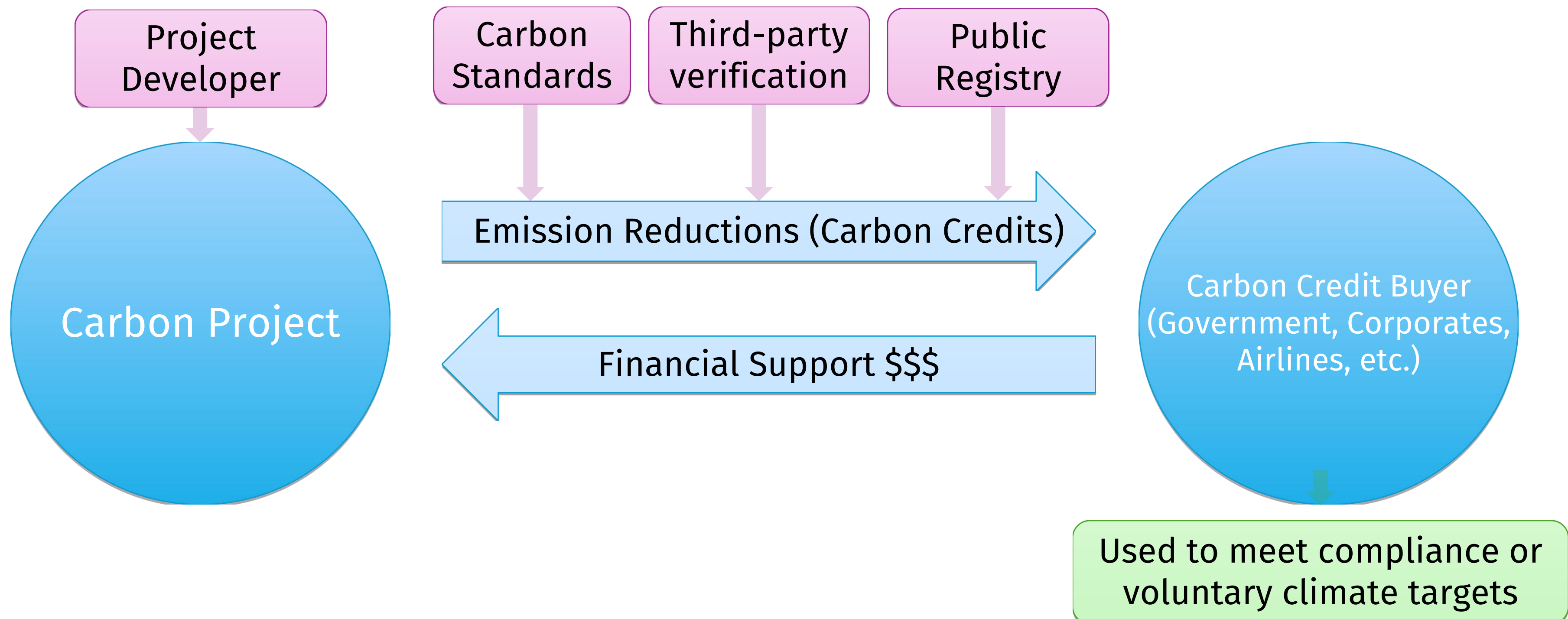


- Development of 80+ technology-based carbon projects in sectors such as:



## SESSION 5: Business Model Innovation

### What is carbon finance?



## SESSION 5: Business Model Innovation

### Safeguards and integrity:

- Ensuring integrity in carbon markets is crucial
- Lessons learned CDM |?| appropriate safeguards in accounting methodologies
- For refrigerant projects, these include:

#### **Detailed protocols**

e.g. sampling, collection, analyses, monitoring, chain of custody documentation

#### **Conservative baseline setting**

e.g. perverse incentives, legislative framework, policy and market trends

#### **Conservative calculation of emission reductions**

e.g. conservative default values & coefficients, uncertainty, alignment with national accounting, fractionation, leaks

#### **Detailed definitions and applicability criteria**

e.g. waste, end-of-life, accreditations, technologies

## SESSION 5: Business Model Innovation

### Main refrigerant carbon project types across lifecycle

**Upstream**  
(production)

**Midstream**  
(in use)

**Downstream**  
(end-of-life)

**Leak Detection**

**ODS Destruction**

**HFC Destruction**

**HFC Reclamation**

**Transition to Green Cooling**

## SESSION 5: Business Model Innovation

### Innovative business models

**Carbon markets leverage finance for LRM activities** that would otherwise not be financially sustainable



**Blended finance:** carbon finance can be combined with other finance sources (MLF Funding, commercial loans, subsidies, taxes, green finance, private capital) to scale or increase the ambition of LRM initiatives

### Innovative policies

Carbon markets can empower governments to adopt policies that drive LRM by leveraging carbon finance, reducing financial burden on governments

## SESSION 5: Business Model Innovation

### Closing

- **Carbon markets can unlock finance to address refrigerant emissions across value chain** and support both climate and ozone goals
- Robust tools already exist, and continue to evolve, to ensure high-integrity crediting of climate impacts that are scalable
- Co-benefits: refrigerant carbon projects also help establish collection and reclamation/destruction infrastructure, robust MRV systems, training of technicians, and reporting systems



SUSTAINABLE  
**COOLING FORUM**

**Thank you**

Dr. Ayse Frey  
Managing Director  
Energy Changes  
[ayse.frey@energy-changes.com](mailto:ayse.frey@energy-changes.com)



UNITED NATIONS  
INDUSTRIAL DEVELOPMENT ORGANIZATION

Progress by innovation



SUSTAINABLE  
COOLING  
FORUM

## Cooling as a Service

Enabling access to clean and energy efficient cooling



*Driving investment in  
climate solutions*

## SESSION 5: BASEL AGENCY FOR SUSTAINABLE ENERGY

- **Who we are**

- BASE is a Swiss non-profit foundation, established in 2001 as an initiative of UN Environment with the support of the City of Basel.
- Our vision is a world where markets embrace sustainable practices and climate solutions are the norm, not the exception.

- **What we do**

- To achieve this, we drive systemic market transformation by developing innovative financial strategies and market-driven solutions that unlock investment in sustainable energy and address climate change.
- We also create the enabling conditions and engage stakeholders to ensure these models are successfully implemented.

## SESSION 5: BASEL AGENCY FOR SUSTAINABLE ENERGY

### • Who we work with

- BASE works with a variety of players and acts as a bridge between the public and private sector.
- Our partners include: multilateral development banks, national banks, financial institutions, development agencies, intergovernmental and philanthropic organisations.





## SESSION 5: BASEL AGENCY FOR SUSTAINABLE ENERGY



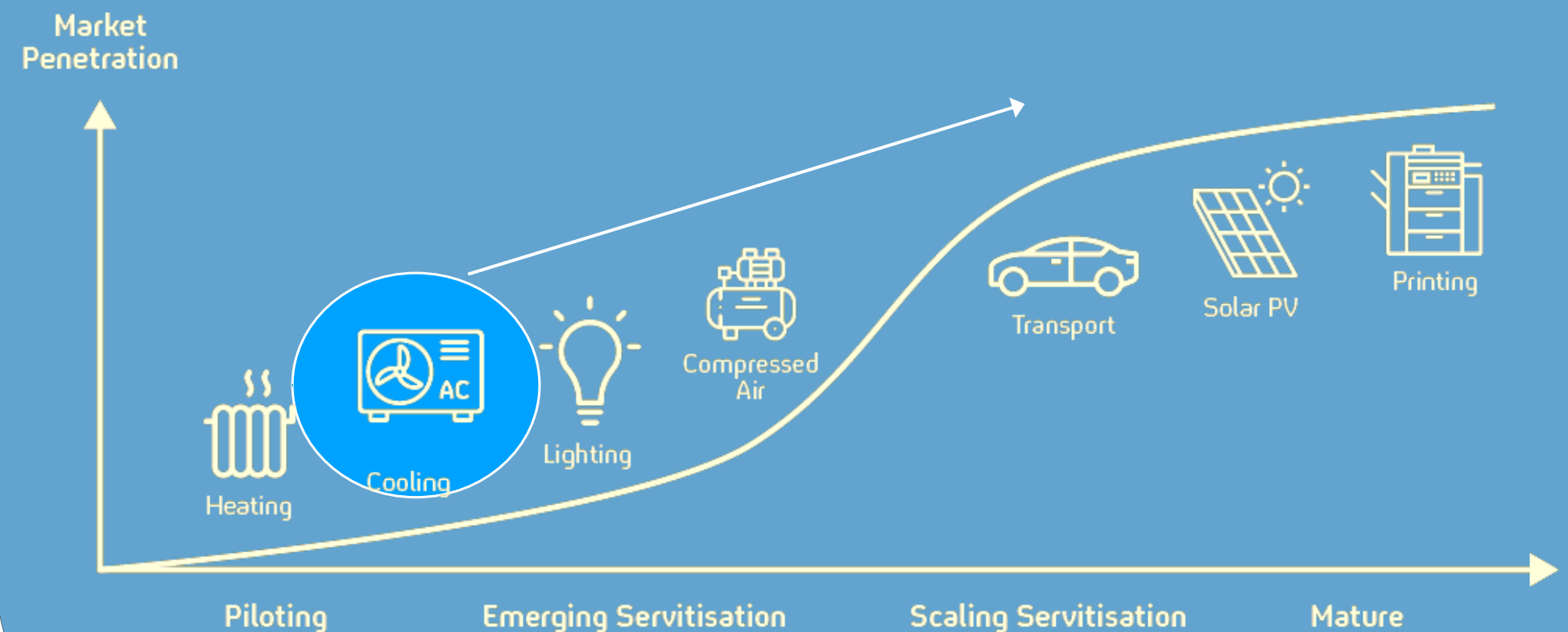
## SESSION 5: Cooling as a Service (CaaS)

### • Tackling Key Market Barriers

- Higher upfront cost of efficient technology (competing against cheap and inefficient tech)
- Lack of trust in performance
- Investment priorities in core business
- Maintenance overlooked and/or spare parts not available

*Investment decision is sensitive to purchase price in traditional sales business models.*

### Mega trend growing across equipment industries

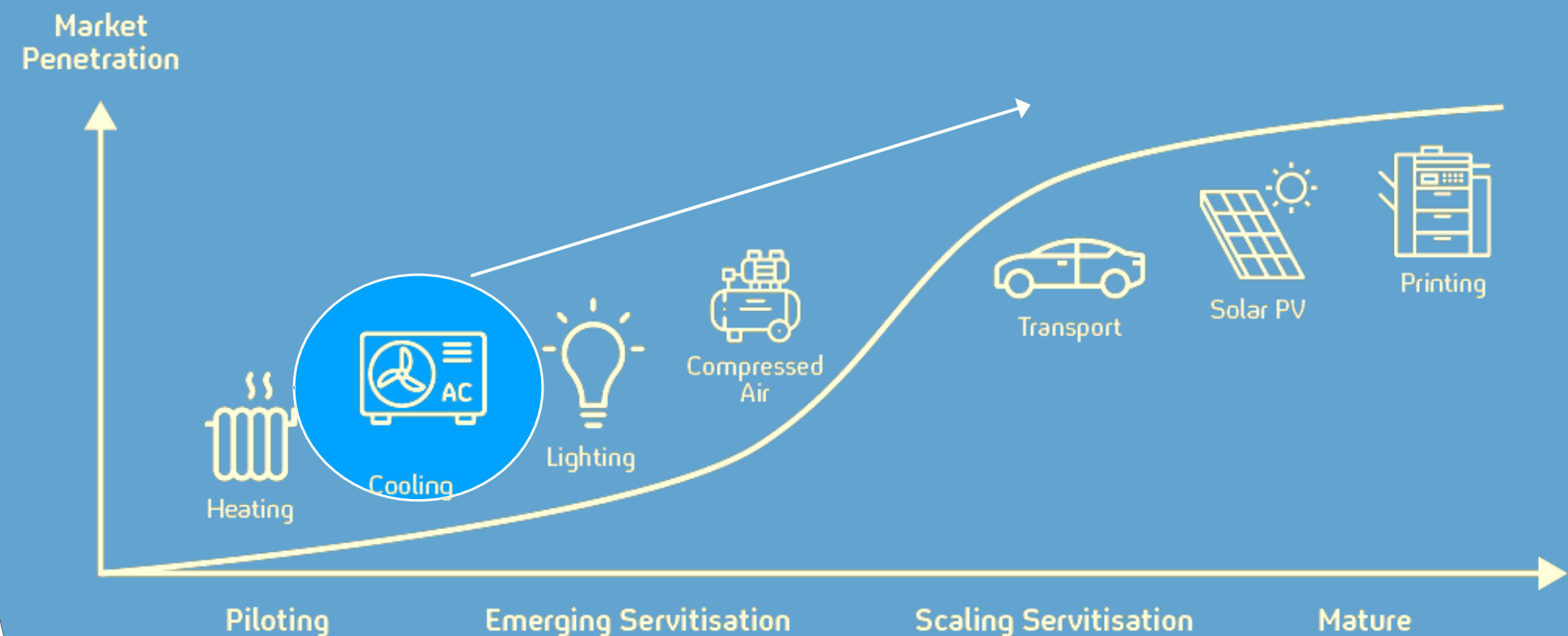


## SESSION 5: Cooling as a Service (CaaS)

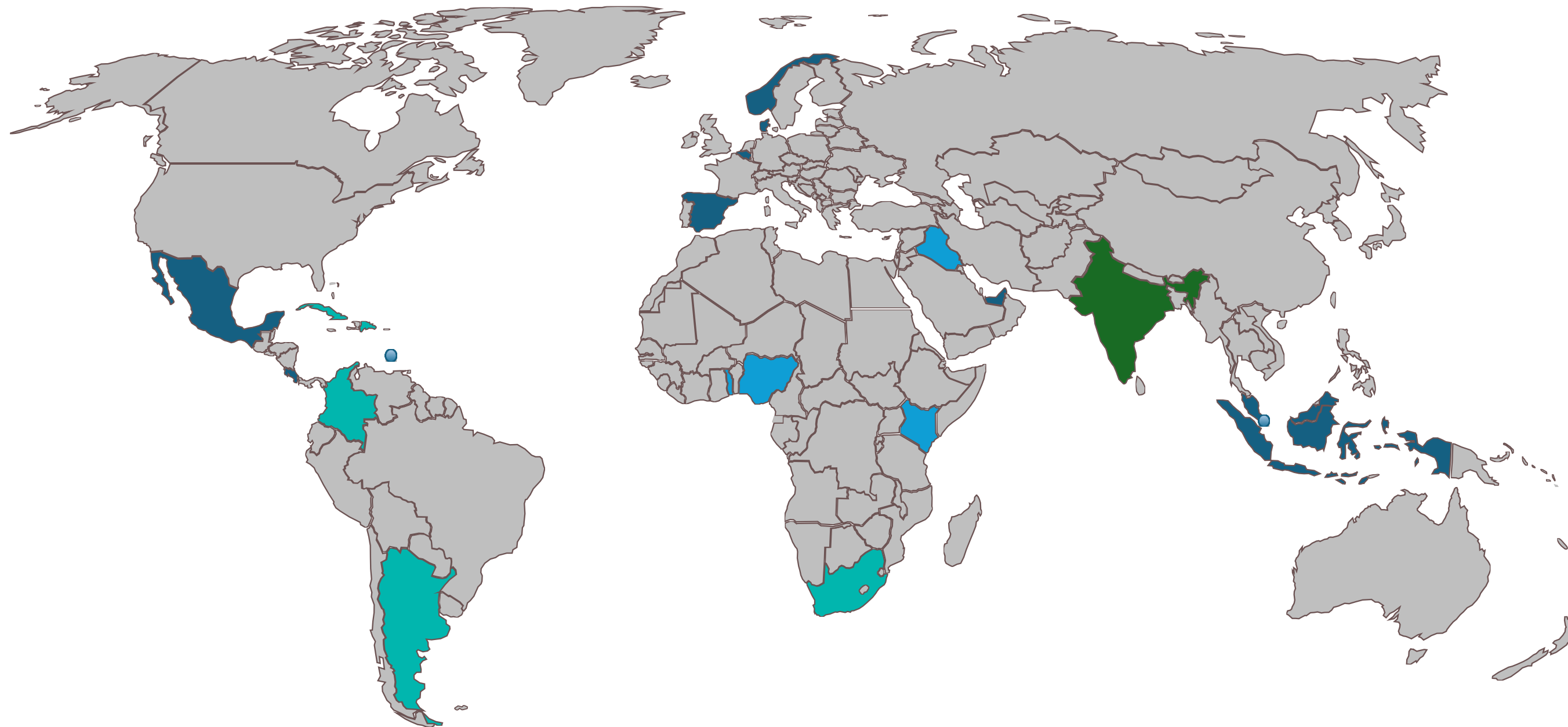
### • CaaS – A Market Transformation

- Innovative & disruptive pay-per-use model
- Providers own equipment
- Customer CAPEX to OPEX
- Aligns incentives for efficient production and efficient consumption
- Makes lower life-cycle cost of efficient cooling tangible
- Recapitalisation of assets for CaaS providers (SPV, sale-leaseback)

### Mega trend growing across equipment industries



## SESSION 5: Cooling as a Service – Growing across sectors & regions



*From Africa, to Asia, Europe and Latam – CaaS is replicable and scalable*

● Industrial/commercial

● Cold Storage

● Industrial/commercial & cold storage

## SESSION 5: Cooling as a Service in Industry



*“Not having to invest a huge amount of capital, as well as the cost savings, has enabled us to complete the entire project.”*

Erkan Yagar Project Manager – Dr. Oetker

### CaaS for Food & Beverage Producer by Energy Partners, South Africa

**Context:** Plant expansion requiring more refrigeration.

**Solution:** Three-stage ammonia refrigeration plant (1,671kW (475.2TR) total cooling) supplying cooling to the process areas, process fluids, blast freezers, holding freezers and cold rooms at the new production facility in Johannesburg (South Africa). Reclaimed heat from the plant has been included in the solution to generate hot water for the site.

**Benefits:** The client benefits of a plant optimised for operational efficiency and redundancy while achieving the lowest possible carbon footprint.

- **Decreased energy consumption by 20%**
- **Saving at least 1,200 CO2 annually considering energy savings and refrigerant leakage**

## SESSION 5: Cooling as a Service in Real Estate



### Commercial real estate complex Pune, India

**Context:** Customer HVAC system near end-of-life, in need of retrofit. Selling point - reduce energy consumption, remove complexity and be renewable.

**Solution:**

- CaaS contract (flexible contract with buyout clause)
- Chilled water HVAC system – 700TR
- Circular water cooling plant – fully solar powered
- Price: Only variable component

**Benefits:**

- 25% Energy savings
- 100% renewable energy

**Financing:**

- Local KAER subsidiary

## SESSION 5: Cooling as a Service in Agriculture



<https://yourvcca.org/>

[www.caas-initiative.org/case-studies](http://www.caas-initiative.org/case-studies)

### CaaS & Coldtivate for Off-Grid Agriculture with ColdHubs , Nigeria



**Context:** Off-grid refrigeration for agriculture products provided “as-as service” with IoT enabled technologies.

**Solution:** Thick insulated cold room with a floor made of stainless steel, containing approximately three tons of perishable food arranged in 150 units in 20kg (44lbs) plastic crates stacked on the floor (3TR (10.6kW) per cold room). The refrigerant used is R-290 (propane), and the power is generated by solar panels. Payments are done daily & upon usage from the farmers on a CaaS model. Operations & sales are optimised through BASE’s Coldtivate mobile app.

**Benefits:** Famers benefit form a high-quality & clean refrigeration, while drastically reducing waste and raising revenues.

- Decreased food waste by 50%, and increased wages by 50%
- Saved 460 tons of CO2 with an annual energy consumption reduction of 547kWh
- In 2019, 24 hubs saved 20,400 tons of food from spoilage.
- Market place sales enabled through Coldtivate.

## SESSION 5: Cooling as a Service – The SET Alliance

SET **ALLIANCE**



AND GROWING....



SUSTAINABLE  
COOLING FORUM

**Thank you**

Dimitris Karamitsos  
Senior Sustainable Finance Specialist & Team lead  
The Basel Agency for Sustainable Energy (BASE)  
[Dimitris.Karamitsos@energy-base.org](mailto:Dimitris.Karamitsos@energy-base.org)



UNITED NATIONS  
INDUSTRIAL DEVELOPMENT ORGANIZATION

Progress by innovation



SUSTAINABLE  
COOLING  
FORUM



# Questions and Answers

## SESSION 5: Business model innovation



**Mr. Oluyomi Banjo**  
UNIDO



**Ms. Ayse Frey**  
Energy Changes



**Mr. Krzysztof Grzegorzczak**  
PROZON



**Mr. Dimitris Karamitsos**  
BASE



SUSTAINABLE  
COOLING  
FORUM

## Session 6

Adaptation in cooling: building resilience and closing the gap

## SESSION 6: Adaptation in cooling: building resilience and closing the gap



**Mr. Alois Mhlanga**  
UNIDO



**Ms. Eleonora Gatti**  
UNIDO



**Mr. Leslie Smith**  
National Ozone Office  
Grenada



**Ms. Simran Singh**  
BASE



**Ms. Giorgia Pasqualetto**  
Sustainable Energy for All



**Mr. Joris De Nocker**  
Afrigeration SARL



UNITED NATIONS  
INDUSTRIAL DEVELOPMENT ORGANIZATION

Progress by innovation



## Cooling as an adaptation solution: building resilience and closing the gap

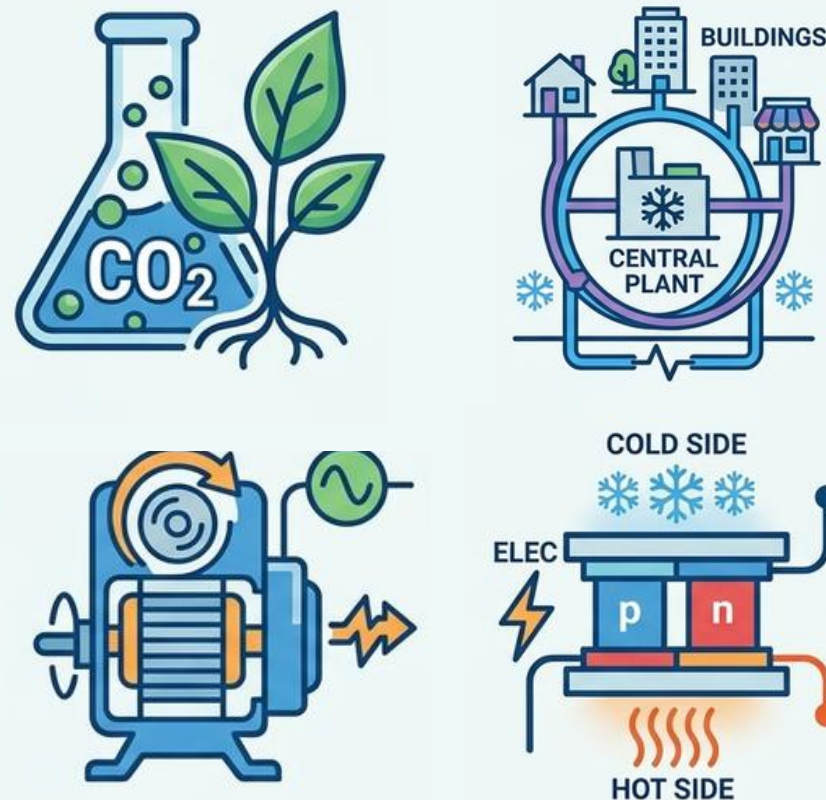
Adaptation and cooling: framing the challenge

# SESSION 6: Cooling as an adaptation solution: building resilience and closing the gap

## Protecting People, Productivity and Resilient Development through sustainable cooling

### Mitigation Solution

"Efforts to reduce emissions and enhance sinks" (UNFCCC)



### Adaptation Solution

"Adjustments in ecological, social, or economic systems in response to climatic stimuli and their effects" (UNFCCC)



Sustainable Cooling

**Cooling as an adaptation strategy**  
 Ensuring **thermal safety** and **resilience** to current and future heat stress through accessible, affordable, equitable and scalable cooling services and systems, including **passive cooling, resilient cold chains for agriculture, green infrastructure for factories.**

Its purpose is to **reduce exposure** and vulnerability to heat, **protect health and well-being**, and **sustain essential services, livelihoods and economic activity** under climate stress. (IPCCC, 2022, World Bank, 2019, UNEP, 2023)

Increased Cooling Demand

↑ Rising heat ↓

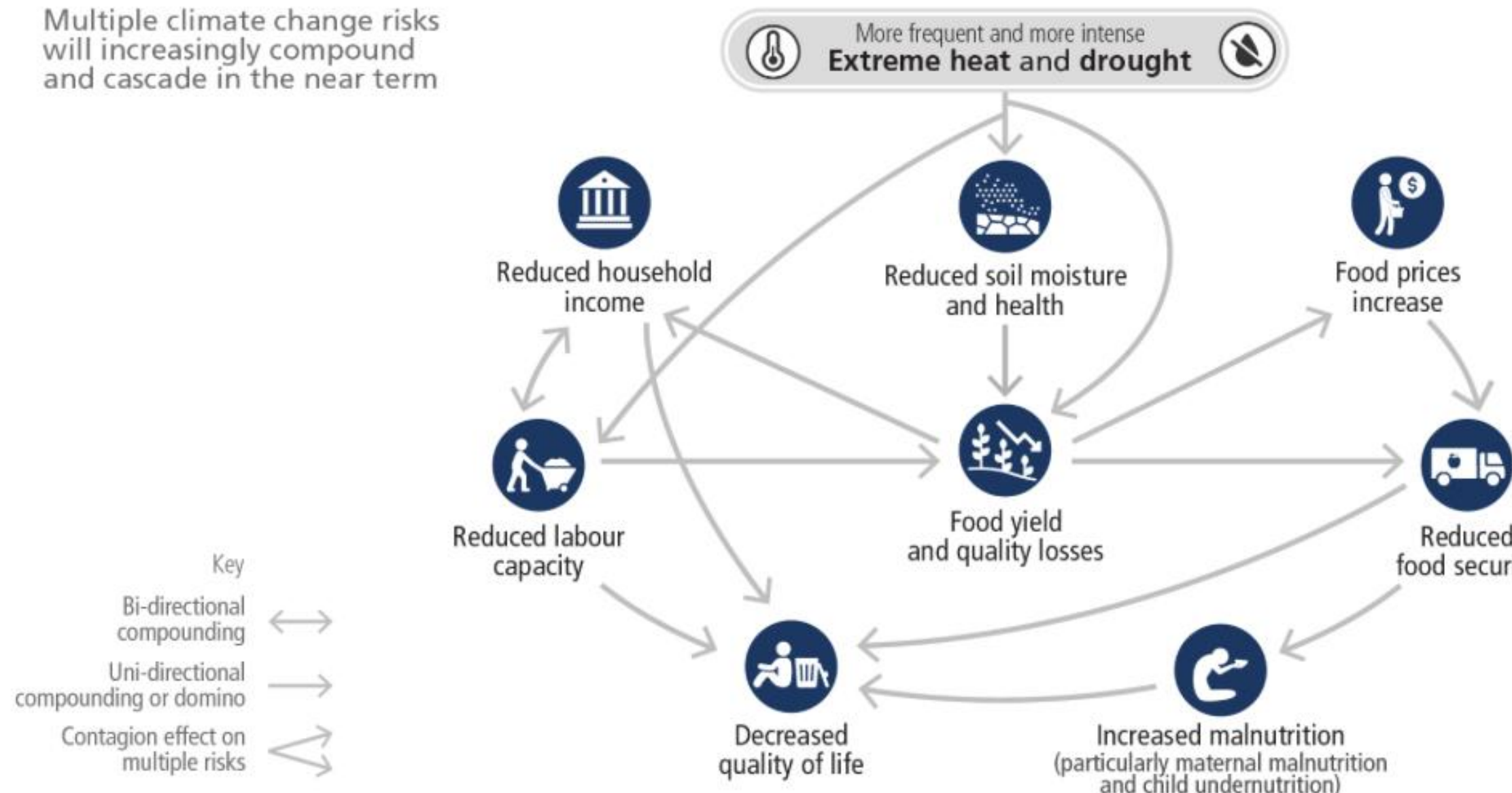
Increased Adaptation Needs

## SESSION 6: Cooling as an adaptation solution: building resilience and closing the gap

### Heat stress increasingly disrupts entire value chains and industries globally

#### c) Example of complex risk, where impacts from climate extreme events have cascading effects on food, nutrition, livelihoods and well-being of smallholder farmers

Multiple climate change risks will increasingly compound and cascade in the near term



**2.41 billion workers** (71% of the global workforce) is exposed to excessive heat each year. (ILO, 2024)

**80 million jobs** by 2030, heat stress could reduce total working hours worldwide by 2.2%, equal to 80 million full-time jobs.

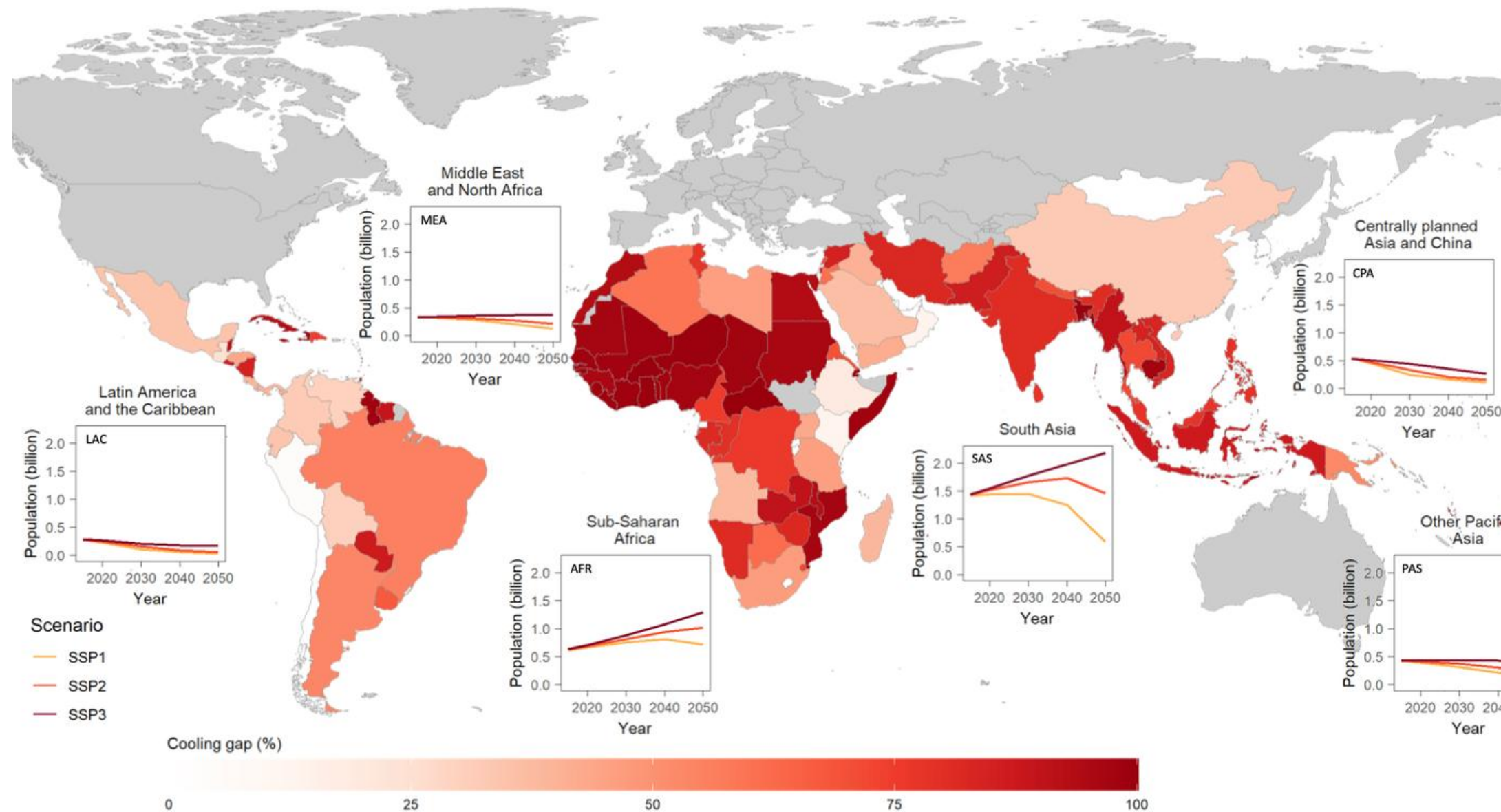
**512 billion work hours** were lost globally in 2023 across **agriculture, construction, manufacturing** and **services** due to heat exposure. (Lancet, 2024)

**Up to 4.6% GDP loss** by 2060, total global economic losses from extreme heat

**Africa (92%), the Arab States (83%) and Asia (74%)** are the regions with the **highest workforce exposure to excessive heat**

## SESSION 6: Cooling as an adaptation solution: building resilience and closing the gap

### The cooling gap is an equity gap



**Figure 1. Map:** Share of population lacking access to cooling where needed (cooling gap) in 2015.  
**Line plots:** evolution of the cooling gap for different regions of the global South in SSP1-3.

IPCC (2023), Figure 4.3, IR6 Synthesis Report

**At the individual/household level** the cooling gaps can be defined as the difference between the population requiring cooling for basic thermal comfort and the population with access to cooling.

Estimated with **1.9 billion to 5.1 billion people lacking access to basic thermal comfort by 2050.** (IIASA, 2022)

**At the productive level / industrial level** the cooling gap can be defined as the difference between the level of cooling required for safe, resilient and productive economic activity and the level of cooling systems and technologies actually affordable and accessible to enterprises, farms, processors and supply chains. (World Bank, 2022, UNEP 2023, FAO 2020)

## SESSION 6: Cooling as an adaptation solution: building resilience and closing the gap

### Examples of sustainable cooling as climate adaptation in action



#### Climate-proofing coastal cold chain for fisheries in West Africa

**Losses can range from 20% to 50%** where cooling and storage are weak

**Solution:** combination of active cooling, improved passive cooling in processing, ice and storage systems, cooling as a service for cooling rooms rental and quality management practices to extend the safe handling window under high heat conditions



#### Agricultural pack-house / aggregation cooling hubs

**470 million farmers lack access to a reliable cold chain;** heat and weak electricity accelerate produce loss.

**Solution:** combine an insulated receiving and pack-house area, pre-cooling chambers or forced-air cooling units, short-term buffer cold storage, while aggregating cooling demand to reduce loss and improve resilience.



#### Passive rooftop cooling retrofits + cooled recovery spaces for the garment industry

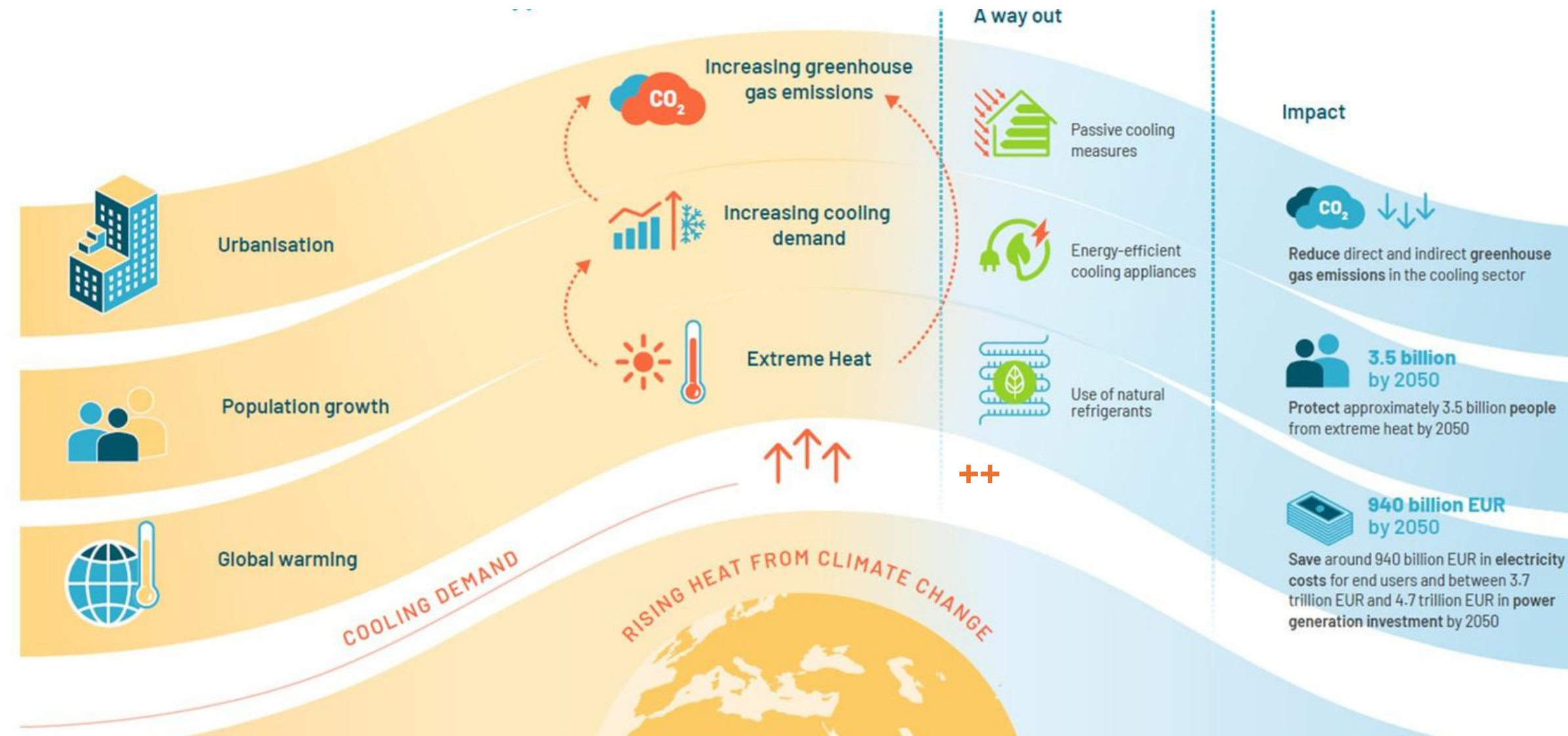
By 2030, heat stress in the apparel industries could cause up to **\$65.8 billion in lost export earnings and 1 million fewer jobs.**

**Solution:** passive building retrofits; improved natural or mechanical ventilation; targeted local active cooling; cooled recovery rooms for heat breaks; hydration and rest protocols; heat monitoring using temperature and humidity; adjusted schedules during peak heat.

# SESSION 6: Cooling as an adaptation solution: building resilience and closing the gap

## Building the enabling ecosystem for sustainable cooling solutions

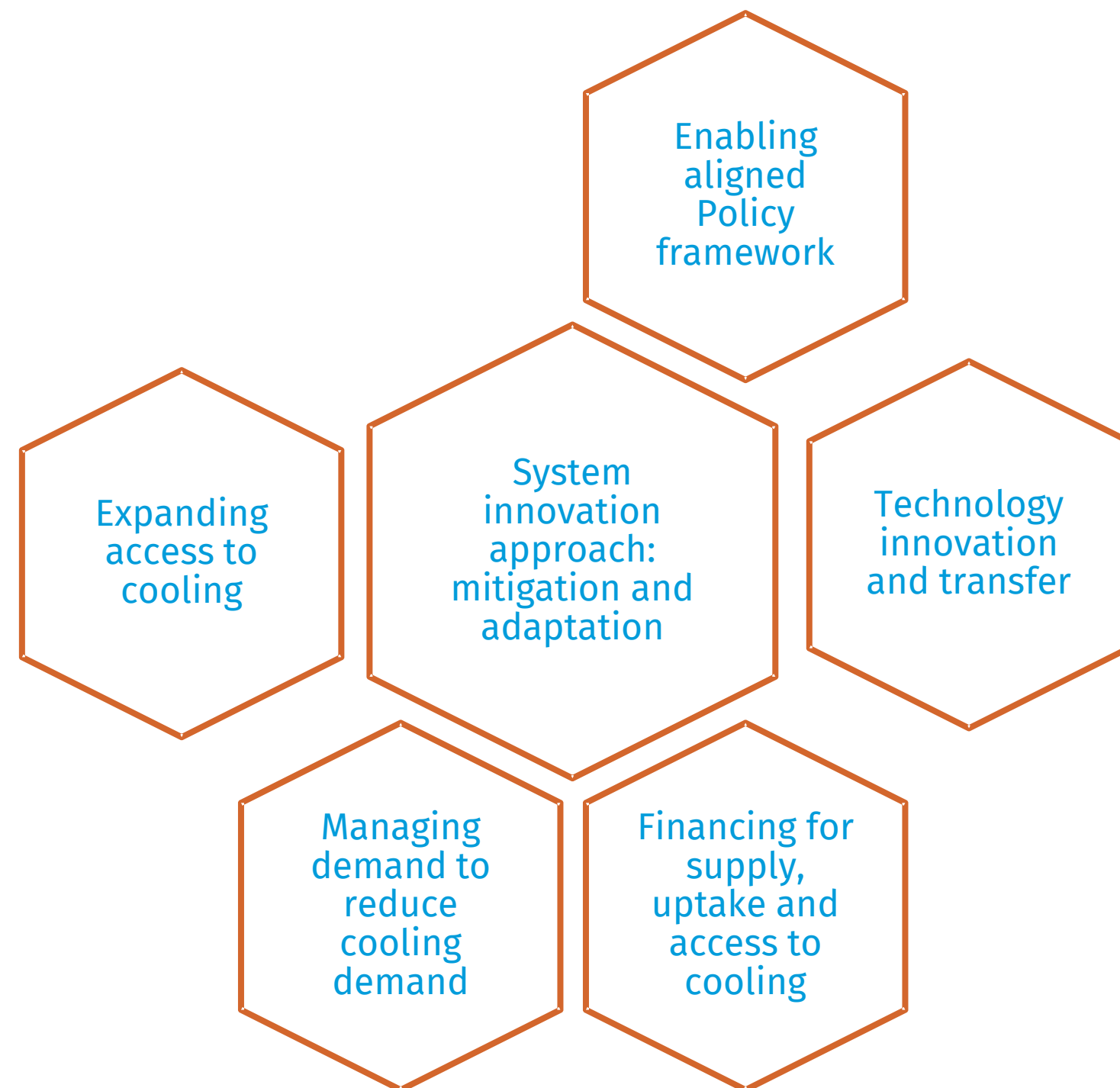
- Policy Gap
- Finance Gap
- Infrastructure Gap
- Capacity Gap



MENA Region Cooling Status Report, CoolUp, 2022

## SESSION 6: Cooling as an adaptation solution: building resilience and closing the gap

### UNIDO's added value to Member States and Partners



UNIDO's role is to support Member States turn sustainable cooling into a systems innovation agenda for industrial development, by linking mitigation and adaptation through six mutually reinforcing functions:

1. Align policy frameworks for sustainable cooling
2. Expand access to cooling as an enabler of resilience and development
3. Promote passive-first and energy-efficient approaches to manage cooling demand
4. Facilitate technology innovation, transfer and industry implementation
5. Unlock financing for supply, uptake and access to cooling
6. Build partnerships to deliver a systems innovation approach linking mitigation and adaptation



SUSTAINABLE  
COOLING FORUM

**Thank you**

Eleonora Gatti  
Head, Climate Technology Innovation Unit  
TCS/CMP/CTI UNIDO  
[e.gatti@unido.org](mailto:e.gatti@unido.org)

## SESSION 6: Adaptation in cooling: building resilience and closing the gap



**Mr. Alois Mhlanga**  
UNIDO



**Ms. Eleonora Gatti**  
UNIDO



**Mr. Leslie Smith**  
National Ozone Office  
Grenada



**Ms. Simran Singh**  
BASE



**Ms. Giorgia Pasqualetto**  
Sustainable Energy for All



**Mr. Joris De Nocker**  
Afrigeration SARL



SUSTAINABLE  
COOLING  
FORUM

**Session 7**

Engaging private sector and partnerships  
for sustainable cooling

## SESSION 7: Engaging private sector and partnerships for sustainable cooling



**Mr. Akos Koeszegvary**  
UNIDO



**Mr. Hamed Beheshti**  
Boreal Light GmbH



**Ms. Barbara Kreissler**  
Independent Consultant



**Ms. Anastasia O'Rourke**  
Carbon Containment Lab



**Ms. Hilde Dhont**  
Daikin



**Ms. Almut Bühling**  
Femmes Chefs d'Entreprises  
Mondiales



UNITED NATIONS  
INDUSTRIAL DEVELOPMENT ORGANIZATION

Progress by innovation

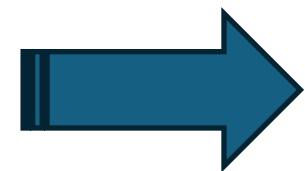


## Engaging the Private Sector for Sustainable Cooling

From compliance to collaboration – key industry insights & what it takes to scale

## Why the Private Sector is critical

- The cooling ecosystem is largely private-sector driven
  - Technology providers and manufacturers
  - Component suppliers
  - Cold chain operators and logistics providers
  - Data Center operators
  - Municipal planners & District Cooling providers
  - Servicing and maintenance companies
  - Financial institutions and investors
  - Real estate and developers



**No transformation without business – but no result without guardrails!**

## From Compliance to Market Creation and Transformation

- **Leverage from Montreal Protocol Framework & Kigali Amendment**
  - Strong regulatory foundations
  - Clear signals for technology transition
  - Proven model for industry conversion
- **Next phase: from compliance-driven to deployment at scale and market transformation**
  - Policy alignment
  - Systemic private sector engagement
  - Large scale replication and deployment of solutions
  - New business models & innovation

## Industry Interviews – approach & methodology

- **Targeted interviews with key industry players**
  - 11 deep-dive conversations across the global value chain
  - OEMs (Daikin, Danfoss, Godrej, Haier, Johnston Controls, Midea, MOON-TECH, Trane Technologies)
  - Financing / business model experts (BASE, KAER, IKEA Foundation)
- **Objective**
  - Identify market opportunities
  - Understand bottlenecks & scaling barriers
  - Identify practical entry points for partnerships
- **What we hear from industry is both encouraging – and very clear**
  - No lack of solutions – but we need to make the system work

## Industry Reality Check : why Sustainable Cooling is NOT scaling

### 1. Finance

- CAPEX versus OPEX
- "Accounting Conundrum": Strict accounting rules make "As-a-Service" models difficult to move off-balance sheet
- Subsidized electricity disincentives efficiency

### 2. Policy

- New technologies available but gaps between policy ambition and implementation capacity
- Lack of unified technical standards (market fragmentation)

### 3. Skills

- Lack of trained servicing workforce
- Safety & standards gap (e.g. flammable refrigerants)
- Weak servicing ecosystem

Cooling is not scaling  
because the system is not  
aligned



Finance, policy,  
technology, and skills are  
not moving together



## What Industry is telling us



“The real barrier to scaling is complexity”

“We are transitioning from selling boxes to selling services”

“Servicing skills are the hidden bottleneck”

“Cooling is the backbone of an organization”

“We are optimizing upfront cost, not lifecycle cost”

“UNIDO is a critical partner for low carbon demonstration projects”

“We do not have a technology problem. We have a market design problem”

“Policy helps but does not ensure adoption”

“Move cooling from basement to boardroom”

## Action Pillars for Unlocking the Sustainable Cooling System Transformation

### 1. Aligning the Economics: Finance & Business Models

- Shift from CAPEX to lifecycle value
- Enable scalable service models (e.g. CaaS)
- Circular technology exchange & end of life management

### 2. Leveraging the Public Sector as a Market Maker

- Procurement as a strategic lever
- Global harmonization of standards (e.g. Green Supplier certification)
- Municipal heat maps

### 3. Strengthening Ecosystem & Technical Infrastructure

- Servicing sector as critical infrastructure
- District cooling
- Digitalization (predictive maintenance & end-to-end traceability, e.g. Cold Chains Clouds)

## Possible Models for UNIDO Private Sector Engagement

1. Policy-to-market bridge
2. Pre-competitive thematic working groups around specific bottlenecks
3. Technology demonstration in National Cooling Action Plans
4. Funding demonstration projects – UNIDO Foundation
5. Servicing Ecosystem Integration – build certified training networks
6. Business Model Incubator – de-risk innovation in CaaS or leasing

**→ moving from policy ambition to market delivery – at scale**



SUSTAINABLE  
COOLING FORUM

**Thank you**

Barbara Kreissler  
Senior Private Sector Engagement Expert  
UNIDO  
b.kreissler@unido.org  
b.Kreissler@gmail.com



UNITED NATIONS  
INDUSTRIAL DEVELOPMENT ORGANIZATION

Progress by innovation



SUSTAINABLE  
COOLING  
FORUM

# Questions and Answers

## SESSION 7: Engaging private sector and partnerships for sustainable cooling



**Mr. Akos Koeszegvary**  
UNIDO



**Mr. Hamed Beheshti**  
Boreal Light GmbH



**Ms. Barbara Kreissler**  
Independent Consultant



**Ms. Anastasia O'Rourke**  
Carbon Containment Lab



**Ms. Hilde Dhont**  
Daikin



**Ms. Almut Bühling**  
Femmes Chefs d'Entreprises  
Mondiales



UNITED NATIONS  
INDUSTRIAL DEVELOPMENT ORGANIZATION

Progress by innovation



SUSTAINABLE  
COOLING  
FORUM



## Session 8

Way forward and closure