

Cool Up Regional Conference: Realising Opportunities in Sustainable Cooling

28-29 September 2022

Istanbul, Türkiye

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Regional Opportunities in Sustainable Cooling

11:30-12:30 CET | Ballroom 3

Simultaneous session

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Agenda



Introduction:

Moderator: **Ahmed Abdelrasoul**, Senior Environmental Specialist, RCREEE, Egypt

Panel presentations:

Marwa Mostafa Khalil, Operations Officer, *IFC Upstream Infrastructure*, Africa, Egypt

Riadh Bhar, Associate Director, *Guidehouse*, Germany

Süleyman Yılmaz, Director, *UNIDO Center for Regional Cooperation*, Türkiye

Panel discussion

Cool Up Regional Conference

Regional Opportunities for Sustainable Cooling

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Istanbul, Türkiye - 29 September 2022

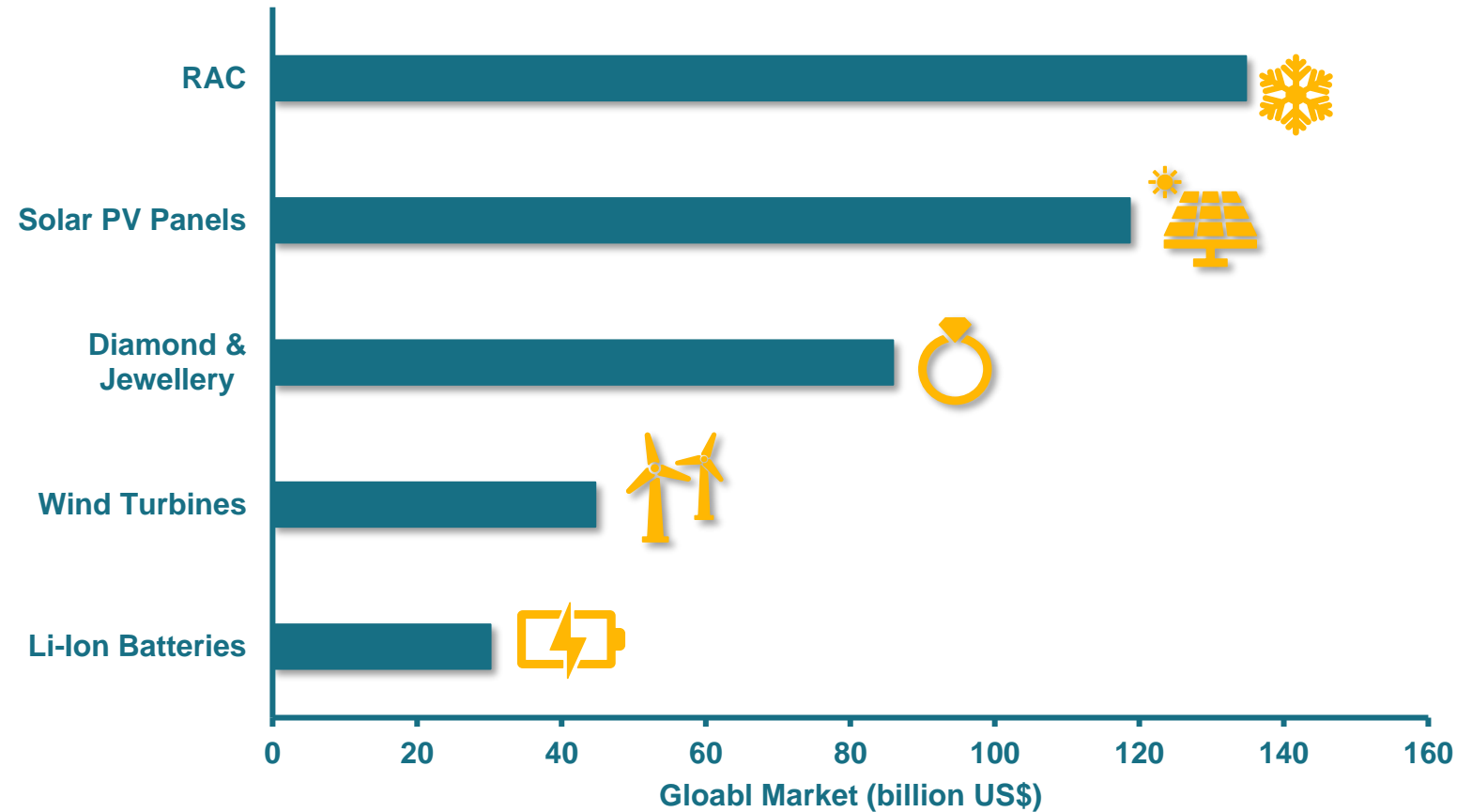
Agenda



- Market Overview of Cooling Technologies
- Necessity of Green Cooling Technologies
- Regional Commitments towards Climate Change
- Regional Trade of Cooling Technologies
- Financing the Green Transition
- Best-Available-Technologies
- Regional Cooling Status Report

Market Overview

A Global Perspective



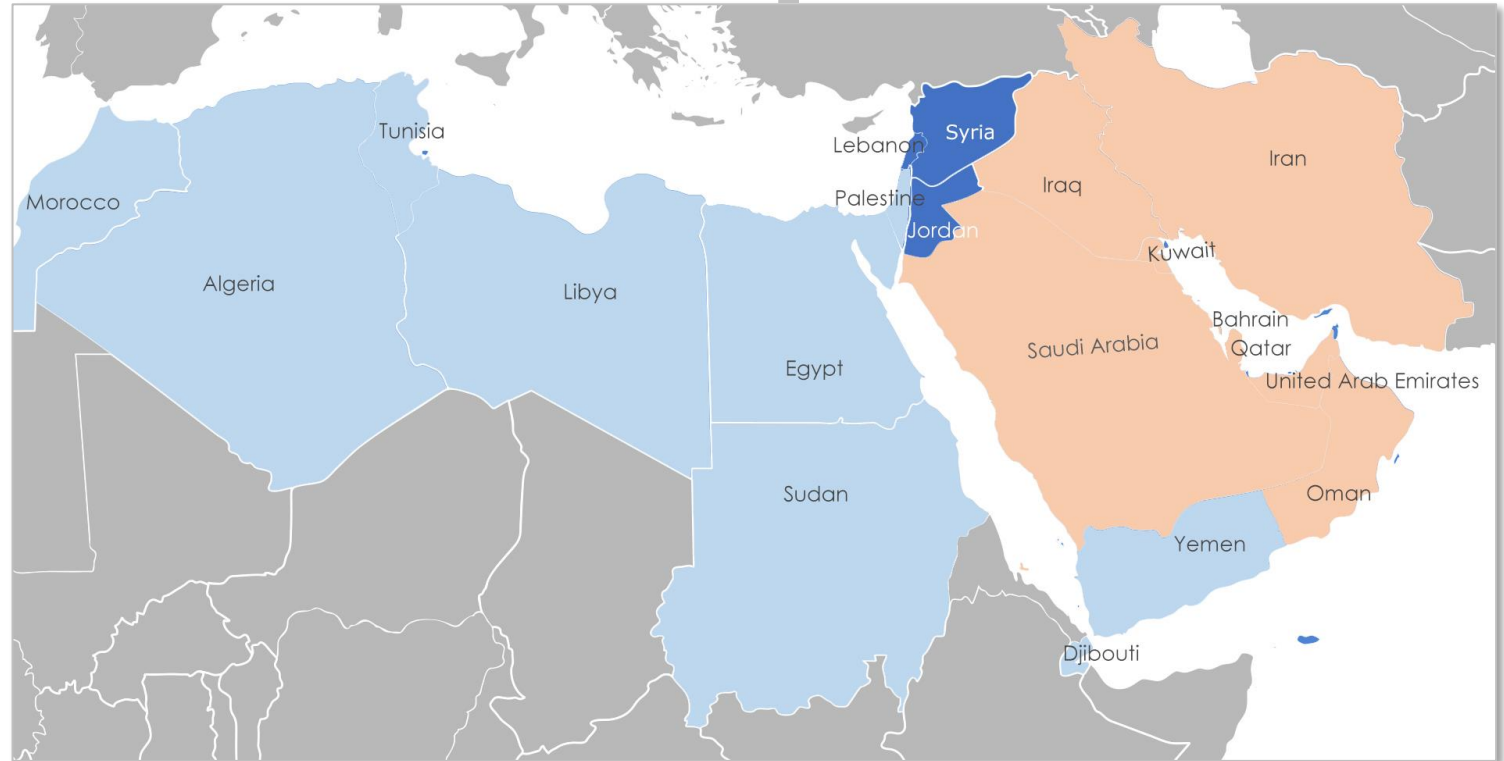
- Refrigeration and Air Conditioning (RAC) global market value versus some selected sectors for the year 2018.
- Global RAC market value was approx. US\$ 135bn compared to US\$ 119bn for solar PV.

Market Overview

A Regional Perspective

- MENA Region includes 20 countries: Algeria, Bahrain, Djibouti, Egypt, Iran, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Palestine, Qatar, Saudi Arabia, Sudan, Syria, Tunisia, United Arab Emirates, and Yemen.
- Total market size of RAC technologies within the MENA region has reached US\$ 7.8 billion in 2018 (w/o Turkey).
- An expected annual growth rate of 5% till 2024 is estimated by market research studies.

RAC market size in Turkiye reached €1.2billion in 2018 with 29% declined sales in 2019



Market Overview

Brands Dominating the Regional Markets - OEMs / Assemblers

Carrier

Trane

**Johnson
Controls**

Daikin

Hitachi

LG

MIDEA

Gree

Sharp

Toshiba

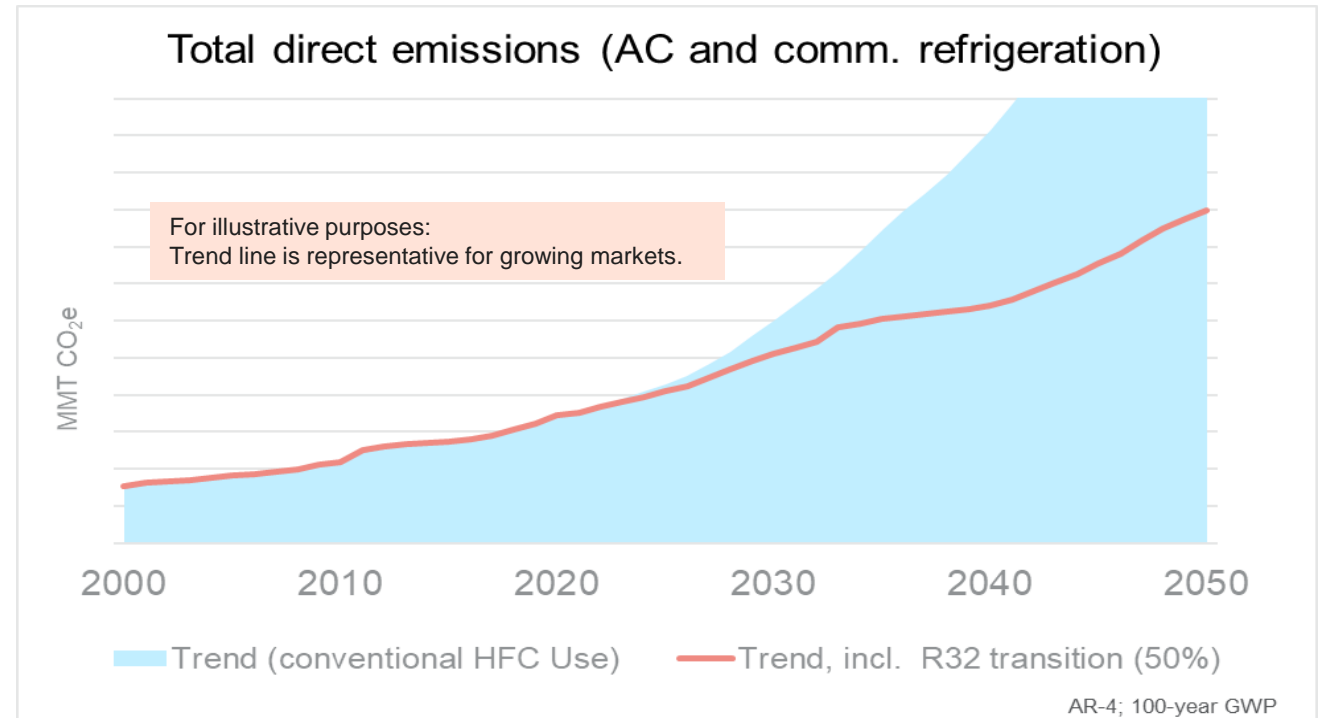
Zamil

PETRA

Necessity of Green Cooling Technologies

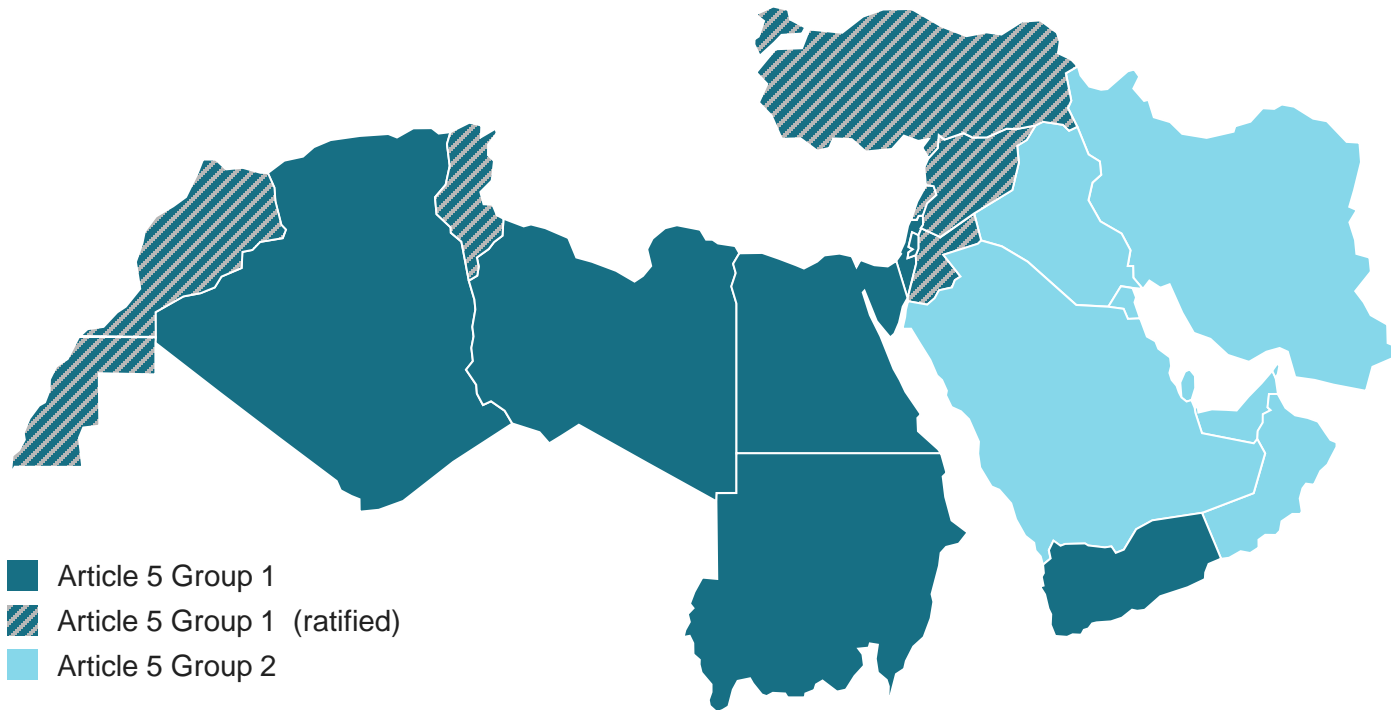
High Growth and Large Market Potential

- Strong increase in refrigerant demand.
- Strong increase in direct emissions.
- Market growth may outweigh HFC demand and emission reductions from a (partial) transition to low GWP / natural refrigerants.
- Early actions that are necessary and inline with the forecasted market growth:
 - Reducing **leakage** rates.
 - **Scrapping** of old RAC units and **recycling** of refrigerants.
 - Use equipment with **low GWP**.



Regional Commitments

Climate Change - Ratification Status of Kigali's Amendment



Country Group	Article 5 Group 1
Countries	Algeria, Djibouti, Egypt, Israel, Jordan, Lebanon, Libya, Sudan, Syria, Tunisia, Turkey, Yemen
No. of countries	13
Ratification requirements	Reduction steps not anticipated earlier than 2024
Ratification complete	6 Jordan, Lebanon, Morocco, Syria, Tunisia, Turkey

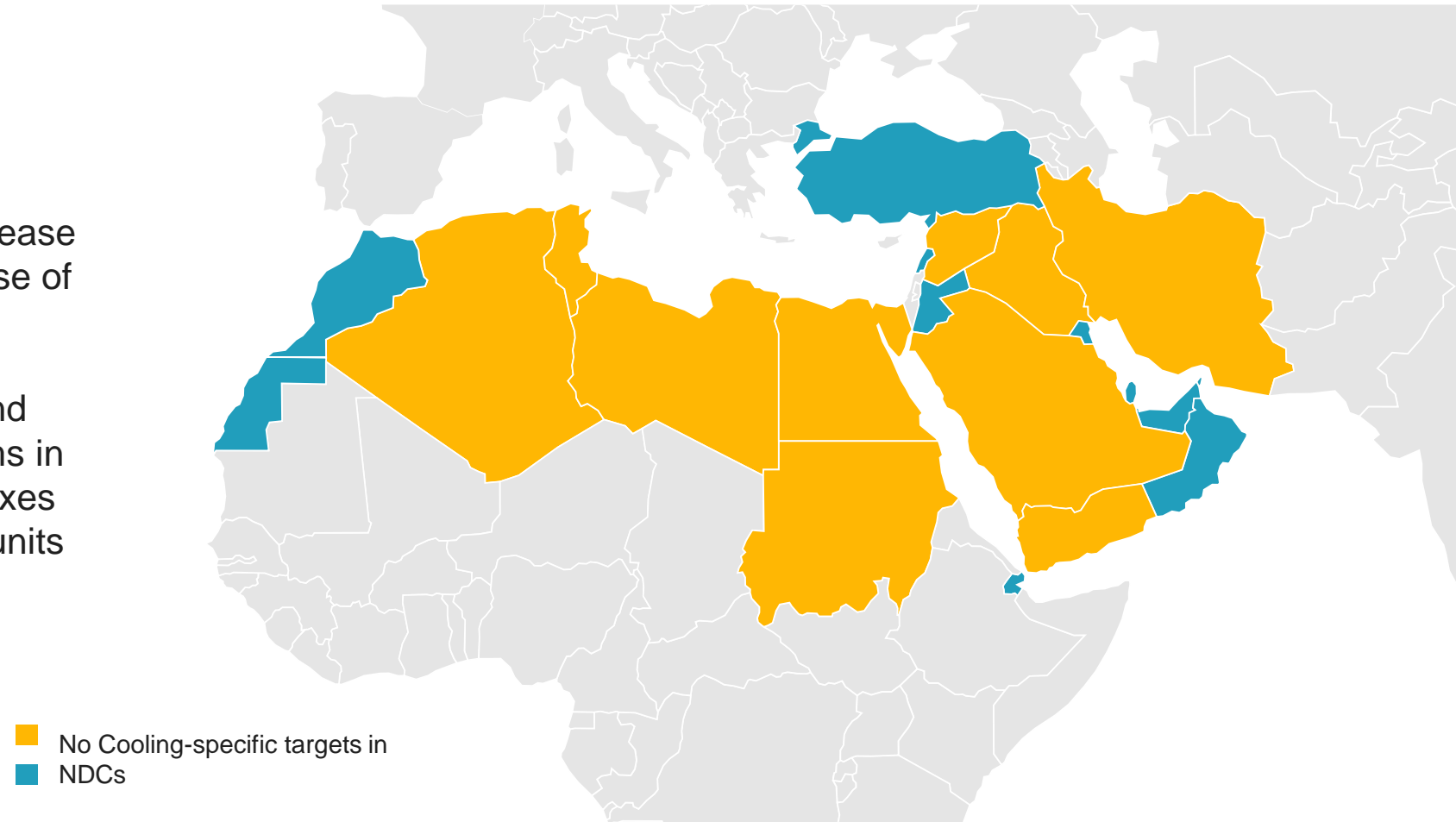
Country Group	Article 5 Group 2
Countries	Bahrain, Iran, Iraq, Kuwait, Oman, Qatar, Saudi Arabia, United Arab Emirates
No. of countries	8
Ratification requirements	Reduction steps not anticipated earlier than 2028
Ratification complete	0

Regional Commitments

NDCs - Cooling Specific Targets

Turkiye

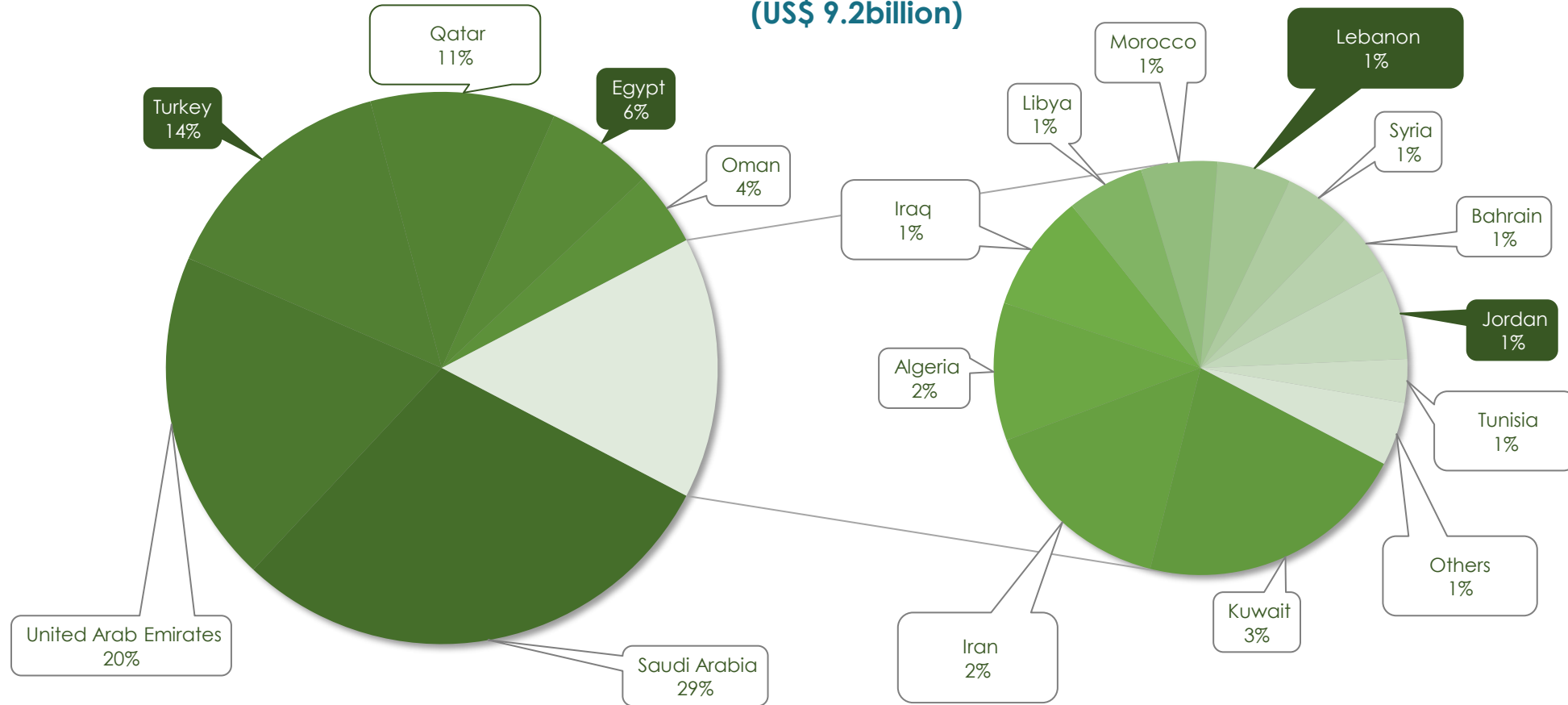
NDC Set goals to increase energy savings and use of renewable energy for heating & cooling by switching to central and district heating systems in mass housing complexes and large settlement units



Regional Trade of RAC

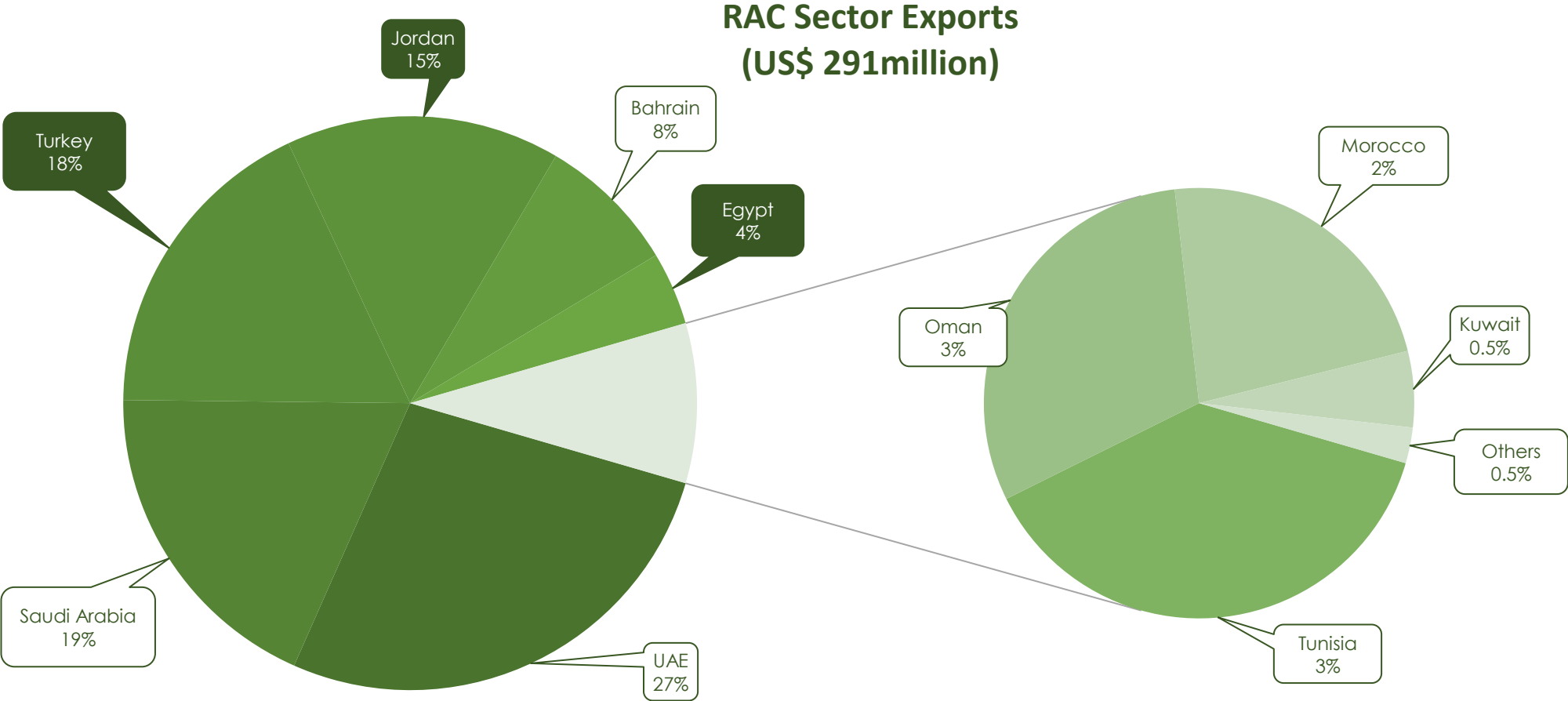
Regional Market Size

RAC Sector Market Size
(US\$ 9.2billion)



Regional Trade of RAC

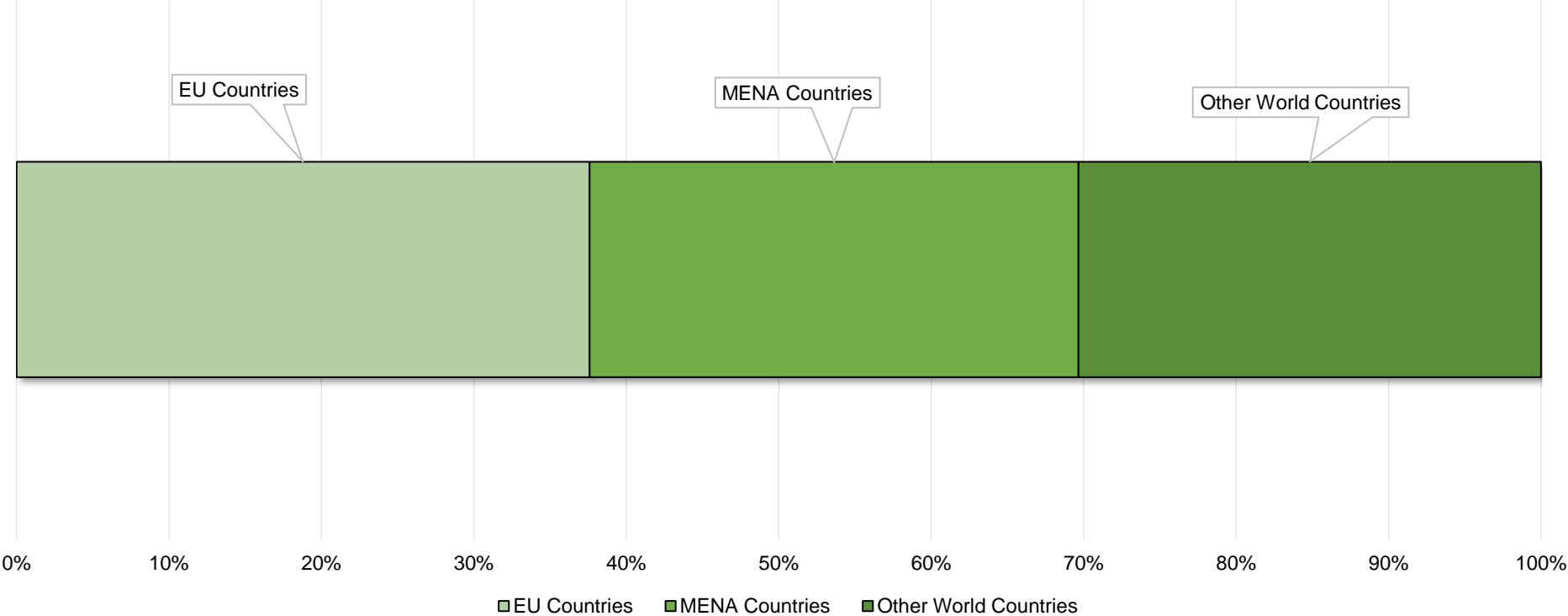
Regional Exports



Regional Trade of RAC

Trade Routes - The Case for Turkey

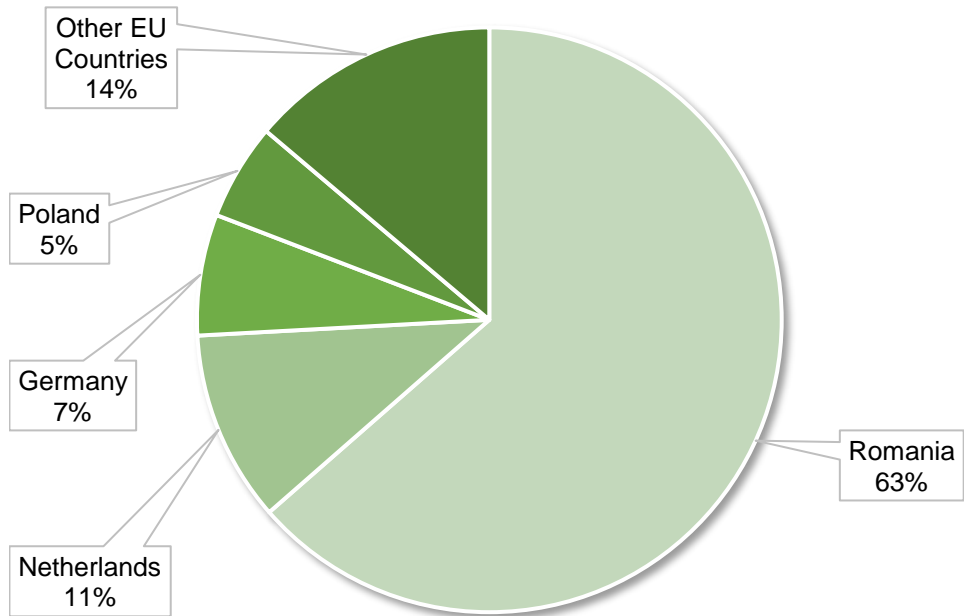
Turkey Exports (US\$ 69.5m)



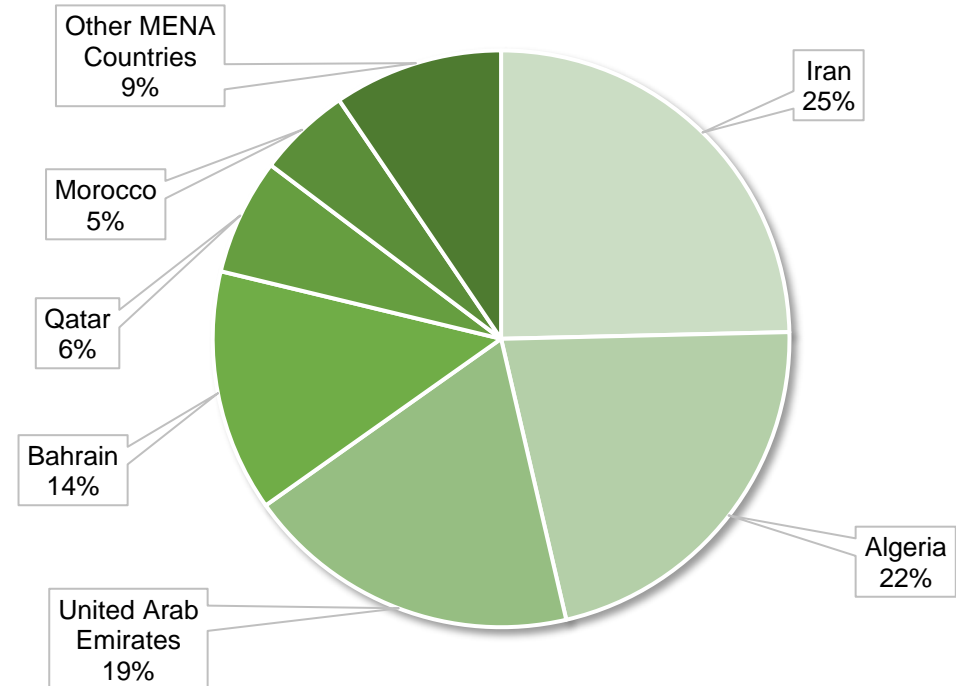
Regional Trade of RAC

Trade Routes - The Case for Turkey

Turkey Exports to EU Countries
(US\$ 26.1m)



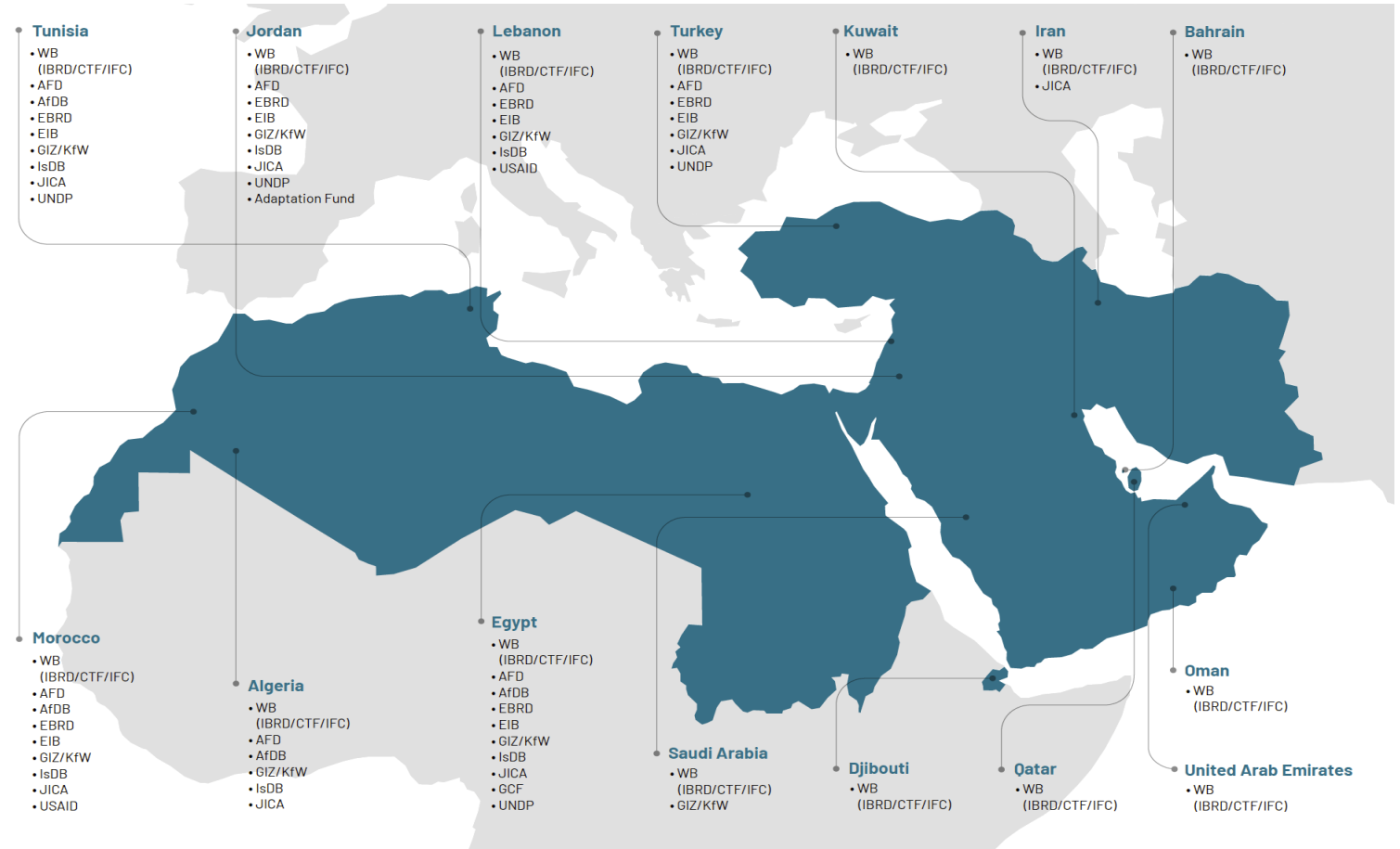
Turkey Exports to MENA Countries
(US\$ 22.3m)



Finance Landscape

Finance Landscape - IFIs

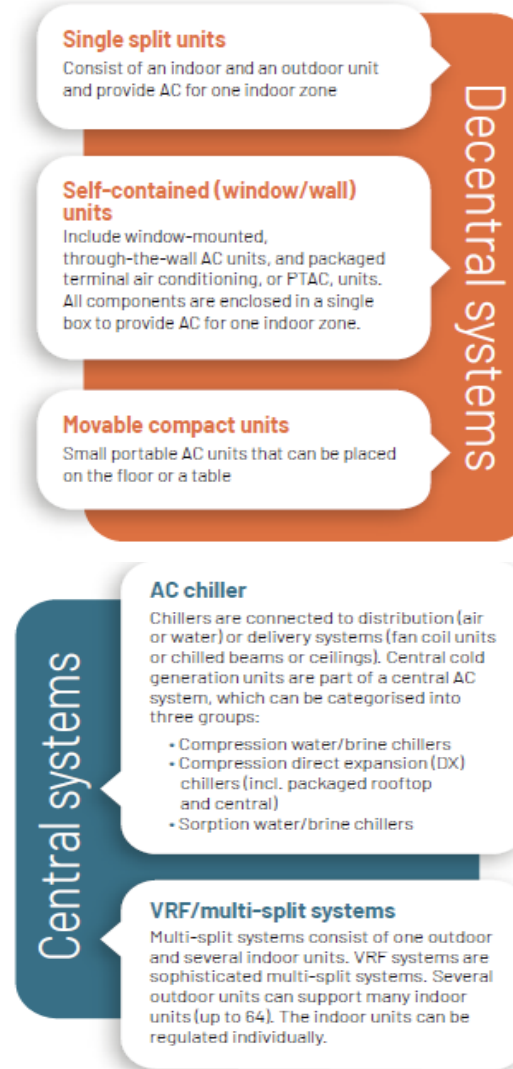
- The MENA region is a crowded donor space due to its peculiar conditions and climate-sensitive geography.
- A variety of donors, France, Germany, the Netherlands, Sweden, and Japan, also channel their support to climate change mitigation and adaptation initiatives through the EBRD, the EIB, and multilateral climate funds such as the GCF, and the GTF.
- The GCF has supported three projects in Morocco for a total of EUR 90 million, two projects in Egypt with EUR 172 million, and one in Bahrain with EUR 2.1 million.
- The EBRD supports climate mitigation and adaptation technologies, it launched its Green Financing Facilities in several countries, facility allocation has reached Euro 2 billion and 750 million in Turkey (TurSEFF + MidSEFF) and Egypt (GEFFs), respectively.



Technology Landscape

Best-Available-Technologies

- The International Energy Agency (IEA) estimates that space cooling may account for more than 15% of the building sector’s electricity consumption globally.
- District cooling technologies are gaining momentum in terms of interest and the number of projects, with several local manufacturers providing integrated services around the system.
- Early front runner technologies in MENA include indirect evaporative coolers, variable flow chillers, modular-central stations, and small-scale thermal storage systems with a few pilot projects in Dubai, Egypt, and Saudi Arabia.



Building type	Dominant cooling technology
Commercial	Chillers (AHUs, FCUs), VRF
Offices	AHUs, FCUs, VRF, Indirect Evaporative Coolers
Hospitals	Packaged AHUs, Chillers, FCUs
Hospitality	AHUs, FCUs, VRF, Chillers
Industrial	Chillers (85% air cooled units, 15% water cooled in food)
Residential	Split ACs (70% fixed speed)
Educational	VRFs, Packaged AHUs
New districts / Urban areas	District systems

Regional Cooling Status Report

What to expect?



Policy landscape

International agreements such as the Kigali Amendment to the Montreal Protocol provide the framework for national cooling targets, which are already underway in some countries of the MENA region.



Market landscape

The total market size of RAC technologies in the region was estimated at around EUR 8 billion in 2018 with an expected annual growth rate of 5% until 2024.



Technology landscape

Variable Refrigerant Flow (VRF) systems are currently the dominant cooling solution for countries in the MENA region.



Finance landscape

Financing institutions and programmes offer new products in the sustainability field that, in part, promote sustainable cooling solutions in some countries.

Go to:

<https://www.coolupprogramme.org/knowledge-base/reports/mena-region-cooling-status-report-issue-1>



This MENA Region Cooling Status Report is the first of a series of regional reports!

Thank you for your attendance

Looking forward to your questions.

Contact

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Cool Up Regional Conference

Regional Opportunities in Sustainable Cooling

The Finance Outlook

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Istanbul, Turkey
September 29th 2022

IFC: A MEMBER OF THE WORLD BANK GROUP



WORLD BANK GROUP

IBRD

International
Bank for
Reconstruction
and
Development

Loans to
middle-income
and credit-worthy
low-income country
governments

IDA

International
Development
Association

Interest-free loans
and grants to
governments
of poorest
countries

IFC

International
Finance
Corporation

**Solutions in
private sector
development**

MIGA

Multilateral
Investment
Guarantee
Agency

Guarantees of
foreign direct
investment's
non-commercial
risks

ICSID

International
Centre for
Settlement of
Investment
Disputes

Conciliation
and arbitration
of investment
disputes

IFC: WHAT WE DO

Integrated Solutions, Increased Impact

LOANS	<ul style="list-style-type: none">▪ Project and corporate financing▪ On-lending through intermediary institutions
EQUITY	<ul style="list-style-type: none">▪ Direct equity investments▪ Private equity funds
DERIVATIVES & STRUCTURED FINANCE	<ul style="list-style-type: none">▪ Derivative products to hedge interest rate, currency, or commodity-price exposures of IFC clients
TRADE & COMMODITY FINANCE	<ul style="list-style-type: none">▪ Guarantee of trade-related payment obligations of approved financial institutions
SYNDICATIONS	<ul style="list-style-type: none">▪ Capital mobilization to serve developmental needs▪ Over 60 co-financiers: banks, funds, DFIs
BLENDED FINANCE	<ul style="list-style-type: none">▪ Using donor funds to crowd in private financing

Sustainable Cooling

Why Sustainable Cooling matters

- Cooling is essential for economic development, productivity, human health, and food security, but it also has significant climate impacts.
- With cooling demand rising rapidly, TechEmerge – an IFC program - aims to accelerate the adoption of affordable, **energy-efficient solutions** that provide cooling for all while mitigating greenhouse gas emissions.
- IFC finds District Cooling a promising sector which can contribute to adaptation and mitigation benefits.

Source: <https://live-techemergem.pantheonsite.io/about-us/>



6 Initiatives

SUSTAINABLE COOLING

TechEmerge Sustainable Cooling Hospitality India

Assess Source Select Match Pilot Scale

Pilots Announced Jan, 2022

SUSTAINABLE COOLING

Assess Source Select Match Pilot Scale

Pilots Announced Jul, 2021

TechEmerge Sustainable Cooling Temperature-Controlled Logistics...

SUSTAINABLE COOLING

Assess Source Select Match Pilot Scale

Pilots Announced May, 2021

TechEmerge Sustainable Cooling – Latin America

SUSTAINABLE COOLING

Assess Source Select Match Pilot Scale

Pilots Started May, 2022

TechEmerge Sustainable Cooling Temperature-Controlled Logistics...

SUSTAINABLE COOLING

Assess Source Select Match Pilot Scale

TechEmerge Sustainable Cooling Retail Cold Chains South Asia

SUSTAINABLE COOLING

TechEmerge Sustainable Cooling Harnessing Waste Cold

DISTRICT COOLING (“DC”)

- DC is increasingly recognized as a development priority, especially in emerging economies located in tropical zones.
- **DC is a scalable technology that is known to reduce energy consumption and GHG emissions by up to 50% as compared to stand alone cooling systems.**
- IFC’s first DC project with Tabeed .. IFC anticipates that Tabreed would contribute to faster market adoption of DC technology in the Asian countries by successfully demonstrating the commercial viability of the "cooling as a service" business model.
- IFC’s US\$ 25 million equity investment (FY22) in Tabreed is an important step forward in proving the concept.
- India will be the initial geographical focus, and other Asian and African countries may be targeted at a later stage.

POINTS FOR DISCUSSION

- Policies should advocate for the adoption of DC
- Energy efficiency and economic Benefits for DC
- Business models for DC
- Financing pilot DC projects
- Rollout of DC in developing countries

Thanks

Marwa M. Khalil
Operations Officer – Africa Infrastructure
International Finance Corporation (IFC)



BUILD_ME

Accelerating 0-emission building sector ambitions in the MENA region project



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Introduction to the BUILD_ME Project



1. Phase: 2016 - 2019 / 2. Phase: 2019 - 2022

Supported by:



based on a decision of the German Bundestag



Problem statement

The lack of a baseline hindering the assessment of low energy buildings

Lack of enforcement and/or
availability of EEBCs

Lack of data about “Business as
Usual” BaU constructions

No benchmarking of buildings’
energy performance

NO

energy consumption baseline

Bottleneck

To finance energy efficient buildings

Our Integrated Solution

Define own baselines and develop tailored energy labelling scheme for new buildings

- Data from real constructions not older than 3 years
- At least 5 cases per building type covered in each country building typology
- Data from subsidy programs, literature, interviews with relevant stakeholders, permits documents etc.
- BEP tool based on ISO 52016, fed with local data used as calculation engine.
- Researched buildings in building typology represents baseline, which is shown in the BEP Tool as default value.

Reference Buildings and Building Typology

BUILD_ME Building Energy Performance Calculation tool

Classification of buildings compared to baseline

Unit	XXX kWh/(m²a)	Baseline kWh/(m²a)	Delta kWh/(m²a)
Space heating	4.51	6.45	-1.94
DHW	5.95	7.02	-1.07
Space cooling	18.98	24.60	-5.62
Lighting	7.95	7.95	0.00
Auxiliary energy	0.42	1.92	-1.50
Total	37.80	47.90	-10.10
Total incl. PV	37.81	47.94	-10.13

	Current	Baseline	Delta
Investment	50 €/m²	41 €/m²	9 €/m²
Replacement	7 €/m²	7 €/m²	0 €/m²
Residual	-9 €/m²	-7 €/m²	-1 €/m²
Energy	31 €/m²	40 €/m²	-8 €/m²
Inspection & Maintenance	1 €/m²	1 €/m²	0 €/m²
Global cost (total)	80 €/m²	81 €/m²	-1 €/m²

Logic of the BUILD_ME tool

Customisable, transparent, adapted to the MENA region



Performance of
energy efficiency
measures & RE



Calculation of
monetary savings



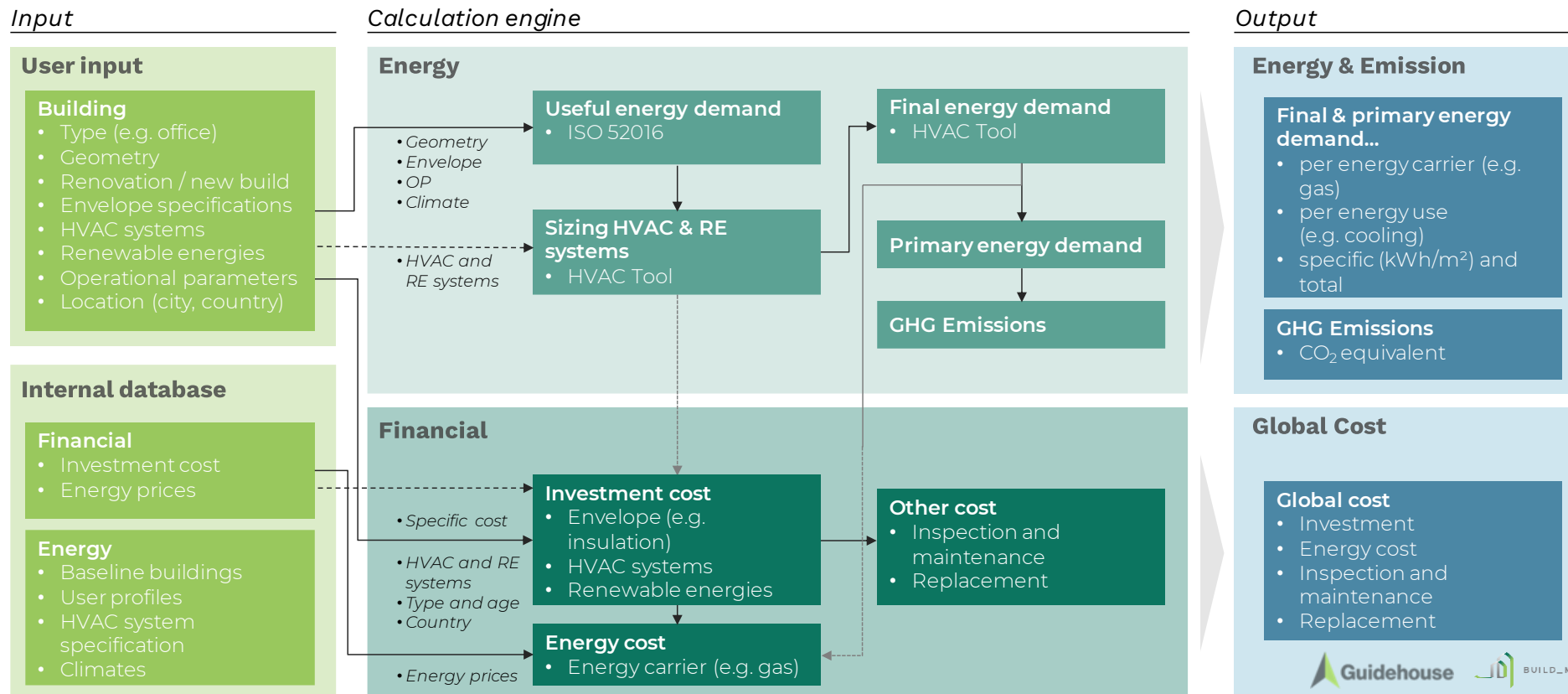
Free web application



Proven methodology

How does it work?

Complex calculation engine based on international norm resulting in hourly results



Online Web App – Results detail

Example of an output derived by the BUILD_ME tool

1| Quick overview

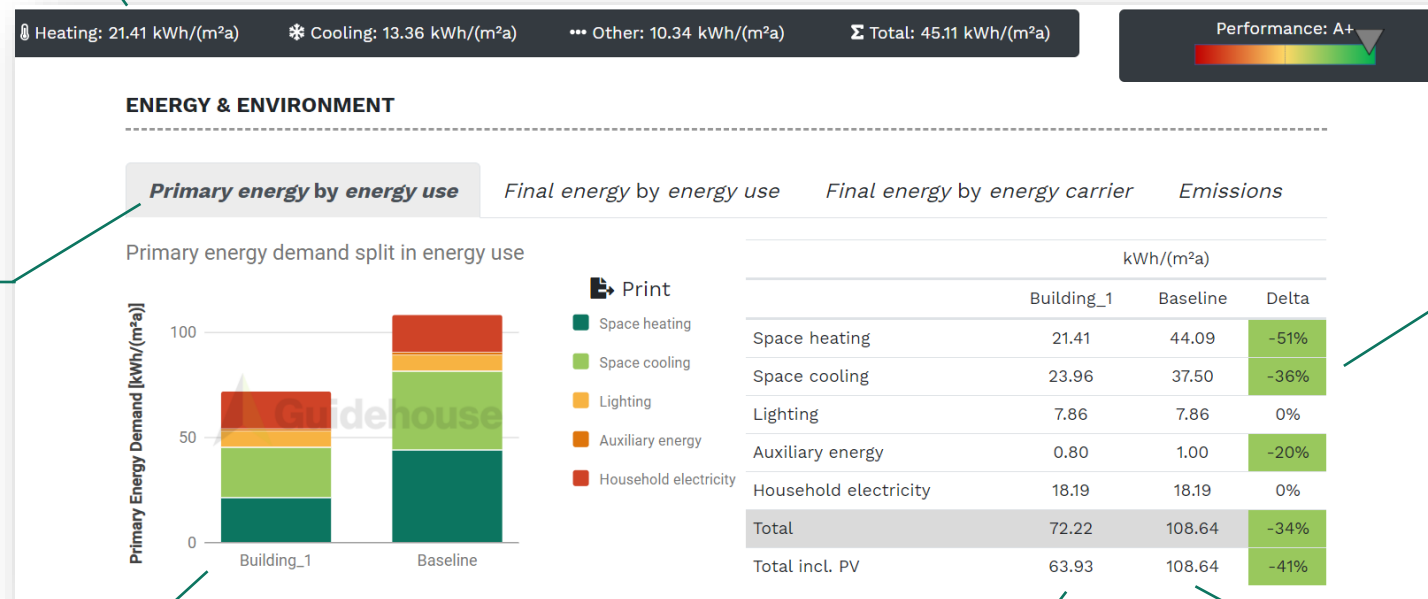
The main facts.

2| Output selection

4 tabs to select the energy performance indicator.

3| Overview chart

Comparison to the baseline building.



4| Results table

Detailed results in numbers.

7| Performance rating

C = equal to baseline

6| Comparison

Difference to the baseline buildings.

5| Baseline building

Detailed results of the baseline building.

What is the added value for (I)FIs

Customisable, transparent, adapted to the MENA region



MENA Specific

Up-to-date baseline in the 3 countries

Up-to-date cost data and prices based on market analysis

Updated energy consumption patterns for building types



Easy/Simple to use

No modelling needed

No advanced in-depth knowledge required



Allows for Editable Inputs and Third Variants' Addition

Can compare with codes/rating systems

Useful for analysing the retrofitting option



Provides Detailed Explanation of the Results

Can convert to primary energy outputs

Can show the distribution of CO2 savings per energy consumer

Thank you for your attendance

Looking forward to your questions.

Contact

RIADH BHAR

Associate Director | Energy, Sustainability and Infrastructure

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Check out our project website and test the BUILD_ME tool

<https://www.buildings-mena.com/info/building-energy-performance-tool>



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Cool-Up Regional Conference

- **UNIDO**
- **Cold-chain and Food-lose**

Suleyman YILMAZ,
UNIDO Country Director,
27.09.2022 'stanbul



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Why is this project in Turkiye?



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Background: Agro industry and energy needs in Türkiye

- dependent on **fossil energy sources**
- needs **transition to reliable and competitive food-systems.**
- needs for **technical assistance** for end users to identify **energy savings investment opportunities in the sector.**
- **nationally generated, evidence-based knowledge to de-risk sustainable energy technology interventions along the value chains**



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Background: Policies&Regulations

- **Barriers: Insufficient policies and coordination** on energy & agriculture
- **Needs:** data-driven assessment of **energy demand** focusing on **cooling in the agro-industries** to lay the **evidence-based** foundation for policy and regulations.
- **No action plans:** on the **role of energy efficiency** and **decentralised renewable energy solutions** to support the **food-systems transition** or national **sustainable cooling strategy**.



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Background: Subsectors & food loss level



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- **Requires: Sub-sector specific action plans and incentives** required to assist private sector's transformation
- **low-carbon energy opportunities** in agricultural and food sectors (e.g., **cooling optimization in beverage, dairy, frozen food subsectors**).
- **Consumes at least 30%** of the energy usage for **Industrial cooling in agro industries**



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Background: Food loss level & System Optimization

- **Food loss in Turkiye: 25% to 40% (estimated) due to storage and transportation problems on cold chains (based on the research of the national refrigeration associations; SOSIAD, ISKAV and ISKID).**
- **Solutions: cooling and refrigeration system optimization on sustainable energy in agriculture**
- **Technology: Current state-of-the-art technology and best practice know-how: energy savings of more than 15% with none or minimal capital investments.**



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What is the UNIDO's Role?



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UNIDOs Role

- **Some companies have achieved more than 30% of energy savings through cooling system optimization**
- Such savings offer numerous, and often indirect, benefits including increased **competitiveness, system reliability, reductions in workplace safety hazards and an overall elimination of harmful pollutants.**



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What are the Outputs?



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Project Outputs

1. Decarbonization of the agro-industry and enhance food security

- adoption of low-carbon technologies
- increased efficiency of the energy use

(e.g., optimization in industrial cooling and cold chains) and

2. Smart farming practices

- reduced soil cultivation, digitization of farming equipment, solar assisted cold tanks, irrigation, and drying systems etc.

3. Accelerates the shift to a sustainable and inclusive food system.

4. Enhances the sector's resilience against energy prices thus economic competitiveness of the sector will be enhanced.



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Coordinations & Partners ?





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Coordination Group

- **Establishment of Special Coordination Group:** for institutional capacity building and supporting policy and regulations under the responsibility of different ministries for transformation across sub-sectors
- **Ensures effective coordination** with other relevant Ministries and agencies (**Presidency of Strategy and Budget, Ministry of Environment, Urbanisation and Climate Change, Ministry of Energy and Natural Resources, Ministry of Industry and Technology**).
- **Chaired by the MoAF.**



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Partners: Private sector

- **Private sector Associations** (e.g., dairy, beverages, fish etc.), local development agencies, **SOSIAD - Association of Refrigeration Industry Business People, Turkish Bioenergy Association** and similar where relevant.
- **MoAF facilitates:** coordination with the **local stakeholders**, such as **farmers, SMEs, agriculture and agro-industry associations**, to extend the project's outreach and leverage additional resources.



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Partners: Governments & Private S. & Local Finance Ins.

- **Government Agencies**, MoAF, other ministries, National Development Agencies, Directorate of Strategy and Budget and other related governmental stakeholders
- **Private sector representatives** (private sector associations and federations, SME Organization (KOSGEB), SOSIAD - Association of Refrigeration Industry Business People
- **Local Finance Institutions & Investors** (Credit Guarantee Fond (KGF), Development an Investment Bank (KYB), TSKB, Development Investment Bank of Turkiye, among other public and private banks etc.)



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Partners: Technology & Academia & Financial Institutions

- **Technology and solution** (e.g., cooling optimization, digital service) providers
- **Academia and research institutions**
- **Financial institutions** (e.g., IFC, KfW, AfD, EBRD, EIB, FMO, WB etc.) and green investment funds (national and international) or adaptation funds in all areas of the project's interventions



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Thank you!!
s.yilmaz@unido.org

Suleyman Yilmaz
IN
UNIDO Country
Representative in Turkiye

Slido – Questions from the audience

Wrap-Up



Thank you for joining the session

Cool Up is part of the International Climate Initiative (IKI). The Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) supports this initiative on the basis of a decision adopted by the German Bundestag.



Supported by:



Federal Ministry
for the Environment, Nature Conservation,
Nuclear Safety and Consumer Protection

based on a decision of
the German Bundestag