



Technician qualification and formal certification in the cooling sector

The pathway from setting up certification schemes to practical implementation.

MOP35 in Nairobi

25.10.2023, 13.00 – 15.00

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Agenda

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Agenda Item	Speaker
Cool Up Programme Overview and Activities in the Area of Technician Training and Certification	Jan Grözinger , Guidehouse
Why is formal technician certification needed? Insights from EU experience	Felix Heydel , Öko-Recherche
Certification on natural refrigerants in the Netherlands - transition to government regulation	Martijn Hildebrand , Sr. Advisor Fluorinated GHG and ozone layer depleting substances, The Netherlands
Country example and experience from Türkiye	Dr. Veysel Selimoğlu , Engineer NOU Türkiye, Directorate of Climate Change
Improving technician qualification and challenges to formal certification.	Madi Sakande , - 3ARC Union of Associations of African Actors in Refrigeration and Air Conditioning

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Cool Up Programme Overview and Activities in the Area of Technician Training and Certification.

Jan Grözinger, Guidehouse & Felix Heydel, Öko-Recherche

25.10.2023



Upscaling sustainable cooling

Programme introduction
26 October 2023



Programme Summary of Cool Up

Upscaling sustainable cooling

Funding:

Supported by:



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

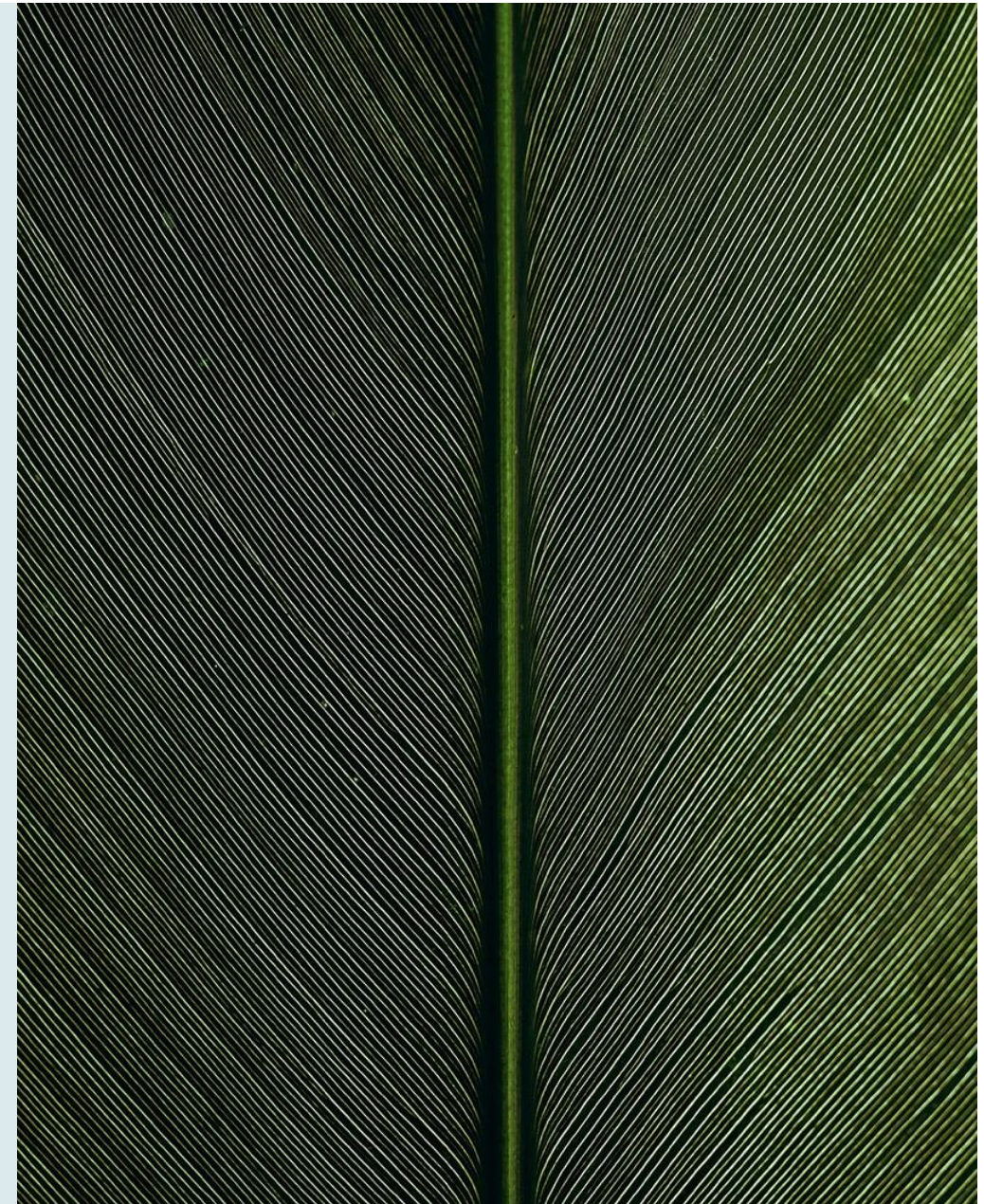
IKI INTERNATIONAL
CLIMATE
INITIATIVE

based on a decision of
the German Bundestag

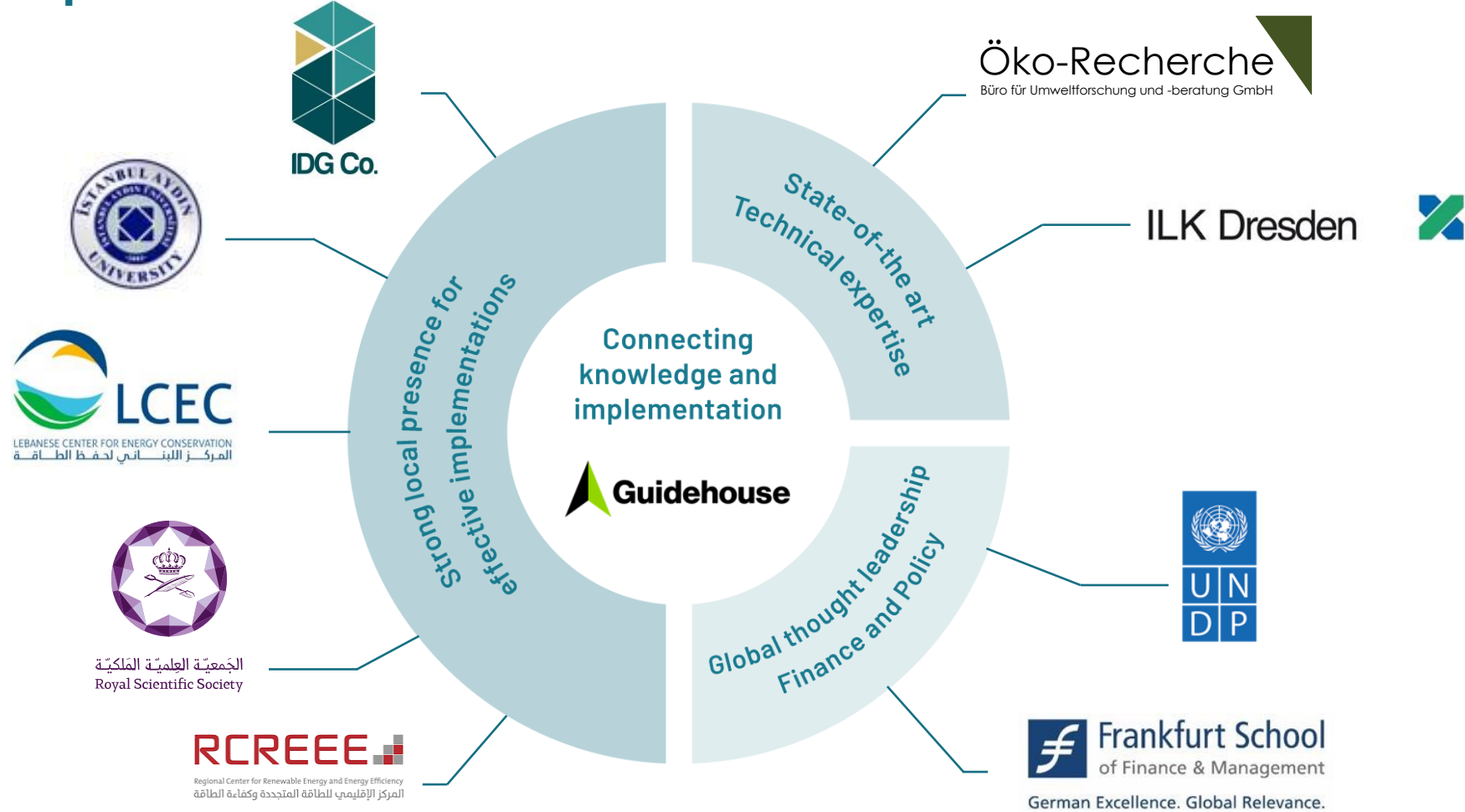
Duration: December 2020 – January 2027

MENA countries face a range of energy challenges against the visible effects of **climate change** due to rapidly growing urbanisation, and heavily strained energy infrastructure.

In the region, **cooling** constitutes a major source of energy consumption, and it is expected to grow further. The Cool Up programme promotes accelerated **technological change** in cooling demand reduction, and early implementation of the **Kigali Amendment** and Paris Agreement in **Egypt, Jordan, Lebanon** and **Türkiye**.



The Cool Up Consortium



Four partner countries as action hubs



Four targets:



Support **reducing cooling demand**;



Support the **phase-down of HFCs**;

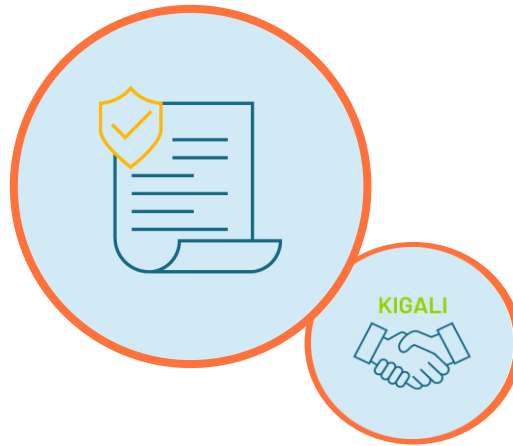


Support **replacing and safely disposing inefficient cooling appliances and refrigerants**;



Support **improving cooling appliance operation and maintenance, training, and awareness**.

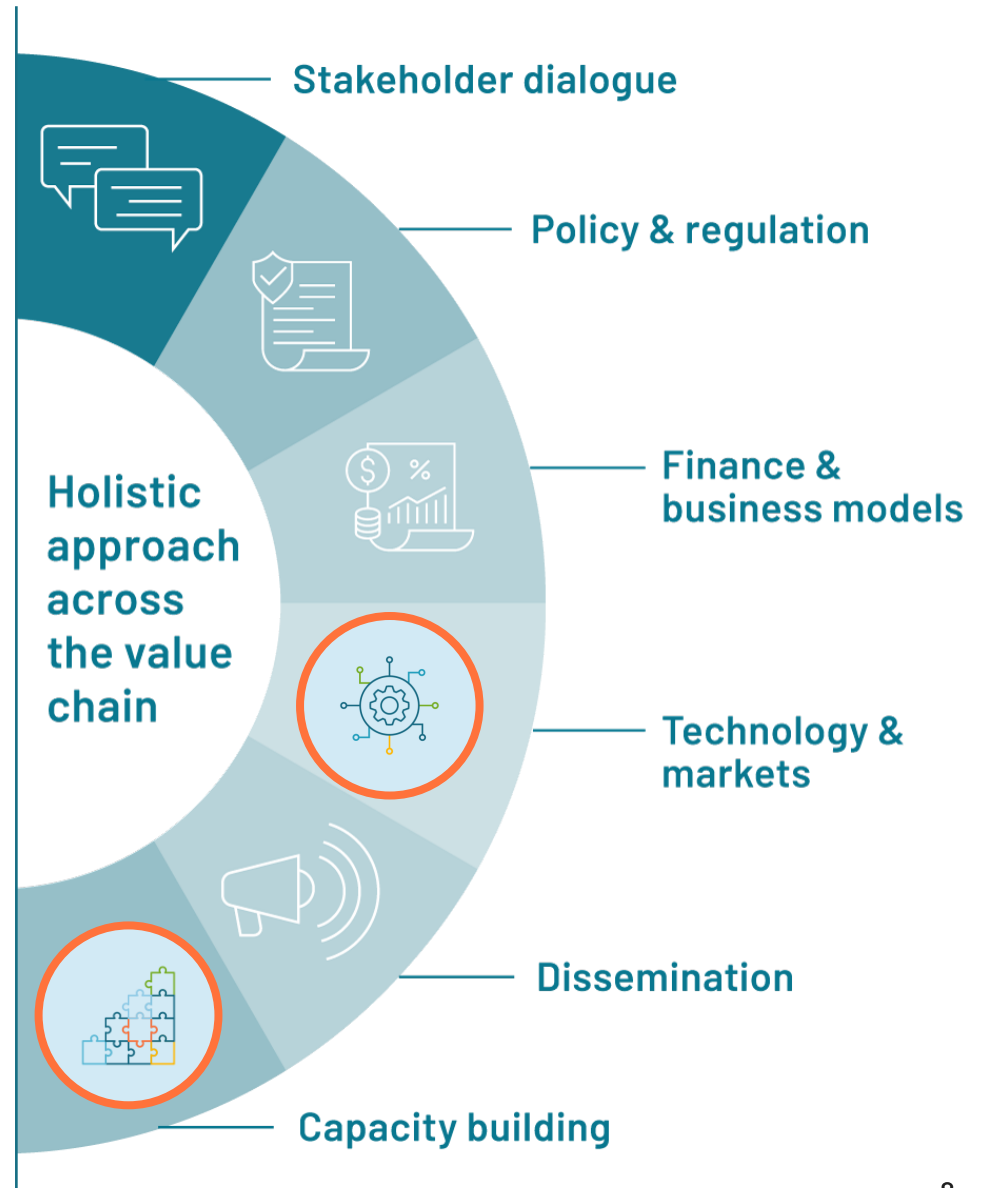
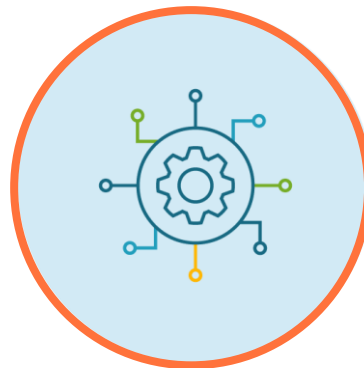
Policy: Support implementation of **Paris Agreement** (through NDCs) and **Kigali Amendment** objectives



Finance: Develop financial models to boost **sustainable cooling**



Technology: Enable **natural refrigerants** and **energy efficient solutions** to mitigate the rising cooling demand



Target group trainings

Particular focus on sustainable cooling technologies, specifically natural refrigerants



RAC Industry

Training-of-trainers

~15 participants (2-4 per country, 5 days long)

40 onward trainings
(3-4 per ToT trainee)

600 participants
(10 trainings per country, 1 day-long approx. with 16 participants each)



Finance

10 trainings

80 participants



Policy

10 trainings

50 participants

Trainings, short term



Vocational education - Training of Trainers

INDUSTRY - Training of Trainers

Participants from
Cool Up action
hubs



REAL Alternatives
learning
programme



30%
theoretical



70%
practical

Sixteen (16)
candidates:

- Experienced
- Able to carry out brazing practice
- English skills

Multiplying impact
through onward
trainings



Training materials
provided in **local
languages**

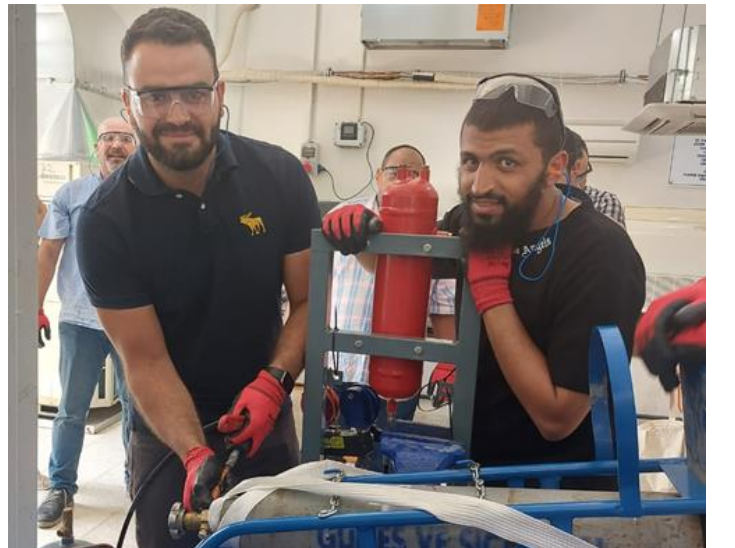


Impressions from the Cool Up trainings

ToT in Istanbul, Türkiye



Technician training in Izmir, Türkiye



RAC Certification scheme in Jordan

Current state

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Certification scheme in Jordan

- **Status**
 - Legislative framework exists
- **Objective** of current Cool Up activities:
 - Adjustments of the existing legislative framework, including:
 - **Requirements** for personnel, and company certification, and for
 - Concerned **certification** and **evaluation bodies**.



Technical and Vocational Skills Development Commission (TVSDC)

Mandate & objectives

- **TVSDC** established in 2019 under Article 31 of the Jordanian Constitution, governed by Law No. (9) / 2019
- The **mission** of TVSDC:
 - Empowering Skill Development
 - Diversifying Learning Pathways
 - Enhancing Technical and Vocational Education and Training (TVET) Quality
 - Expanding Financing Horizons
 - Championing Lifelong Learning



Certification Schemes

Collaborative Efforts and Initiatives

Updating of minimum requirements

- Assessment of technician accreditation processes through extensive discussions held with TVSDC
- Adaptation to accommodate the **rapid advancements** in the field, specifically
 - Inclusion of requirements concerning natural refrigerants (i.a. flammability) and energy efficiency issues
- Special focus on integrating **natural refrigerant** technologies into training programs



Certification Schemes

Collaborative Efforts and Initiatives

Integration of RAC technician personnel in a national Technician Platform

- Collaboration with an ongoing development of a comprehensive technician platform in Jordan
- Designed to encompass technicians from diverse fields, including those skilled in natural refrigerants



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Why is formal technician certification needed?

Felix Heydel, Öko-Recherche

25.10.2023

Activities concerning training & certification

Review & adaptation

- Review & adaptation of existing **qualification & training programmes** should be carried out to enhance the skill level of the work force to:
 - Ensure **emission prevention**
 - Assure **safe handling** of existing and new cooling equipment
 - Especially when switching to environment-friendly alternatives to F-gases.
 - **Further promote** the safe & efficient use of existing and new cooling systems.



Photograph: Andrew Aitchison/In Pictures via Getty Images

From qualification towards certification

Establishment & integration

- Establishment of **minimum requirements** for personnel and companies
- **Integration:** minimum requirements to be based on **agreement** of a wide range of stakeholders in the sector (state, industry, associations, end-users)
- Set-up of a **formal scheme** to attain qualification at national or regional level, inclusion is national legislation



Photograph: JusProfi

Formal certification schemes

Benefits 1/2

- **Provide certainty** that certified personnel has certain **skills & knowledge** (comparability, formalisation of skills)
- **Confirmation** of skills and knowledge held by technical personnel
 - Proof of enhanced qualification level in the servicing sector
- **Create confidence** at end-users/clients' side.
- Provision of **increased accessibility**: Training not only provided through (one) private providers/institutes but also state entities. Formally nominated certification bodies take the exams.



Formal certification schemes

Benefits 2/2

- Technicians are **trusted advisors** on changes to and replacements of systems
- Technicians are **taking the lead** in bringing awareness about maintaining EE
- **Including EE ensures sustainability** of initiatives during HPMP and KIP



Outlook for the MENA region

Regional certification schemes

- Allowing for **mutual recognition** of certificates from several countries would:
 - Allow to conduct **company internal trainings** and provide certificates across national borders
 - Provide the opportunity to address **shortage of skilled workers**, especially for:
 - **Natural refrigerants**, where this is constraining uptake of natural refrigerants)
 - Technically **sophisticated installations** (e.g. centralised CO₂ systems)



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EU Experience

Felix Heydel, Öko-Recherche

25.10.2023

EU F-gas Regulation – Main elements



Measures to avoid the use of F-gases



Measures to prevent leakage of F-gases

Legislative basis in the European Union

- **First** EU F-gas Regulation EC 842/2006 focused on **avoiding leakages** of F-gases
- **Second** EU F-gas Regulation (EU) No 517/2014 further required Member States to assure **access to information** on F-gas alternatives
- **Third** EU F-gas Regulation specifically mentions **theoretical and practical skills** on alternatives to F-gases



Training &
certification

F-gas Regulation (EU) No 517/2014

For training and certification (Article 10), F-gas Regulation (EU) No 517/2014 only mentioned '**access to information**' for alternatives (Art. 10 (8b))

8. Member States shall ensure that all natural persons holding **certificates** under certification programmes provided for in paragraphs 1 and 7 have **access to information** regarding each of the following:
- (a) **technologies** referred to point (e) of paragraph 3; and
 - (b) existing regulatory requirements for working with equipment containing **alternative refrigerants** to fluorinated greenhouse gases.

Changes to the EU F-gas Regulation

Article 10

Certification and training

1. *Natural persons* shall **be certified for** carrying out the following *activities* involving fluorinated greenhouse gases **in accordance with Articles 4(6), 5(1) and 8(1)** and relevant alternatives to fluorinated greenhouse gases **including natural refrigerants:**
 4. The certification programmes and training **on practical skills and theoretical knowledge** provided for in *paragraph 3* shall cover the following:
 - (a) applicable regulations and technical standards;
 - (b) emission prevention;
 - (c) recovery of fluorinated greenhouse gases listed in Annex I and **in** Annex II, Section 1;
 - (d) safe handling of equipment of the type and size covered by the certificate;
 - (da) safe handling of equipment with flammable or toxic gases or operating under high-pressure;**
 - (e) **the measures of improving or maintaining the energy efficiency of equipment during installation or maintenance.**

RACHP sectors relevant under the EU certification scheme

Types of equipment containing F-gases for which certification is required in the EU for conducting specific activities



**Stationary
RAC&HP**



**Stationary
fire
protection**



**Solvent -
containing**



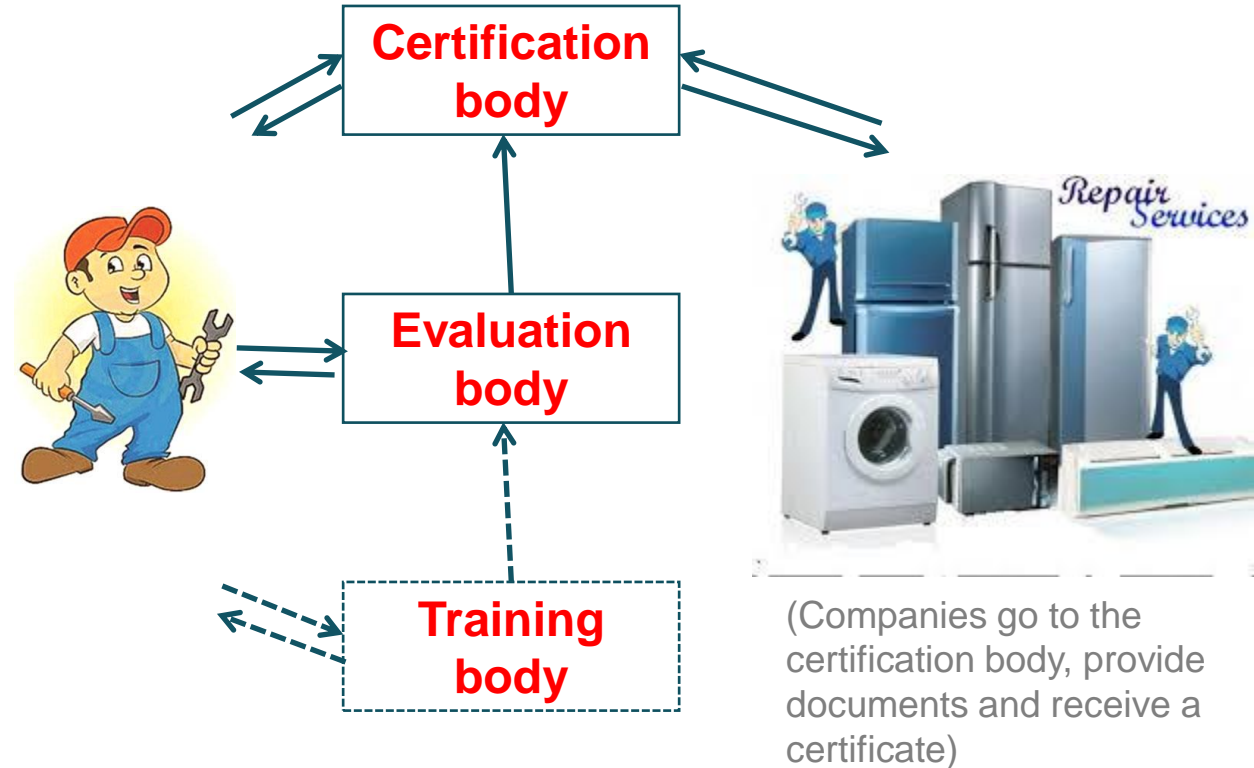
**Refrigeration
units on
trucks (mass
>3.5 t)
and trailers**



**Electrical
switchgear**

General requirements within the EU system

- **Certification body** (or bodies) to issue certificates
- **Evaluation body** (or bodies) to organize examinations
 - → Passing the exam is a pre-condition to receive a personal certificate
 - Examination contains 2 parts: *theoretical* and *practical* examination is mandatory
 - Examination programme must contain topics specified in the (five) Commission Regulations
 - Examination is obligatory to obtain certificate, Member States must establish systems providing the opportunity to participate in training
- **Training** but must be available and must include alternative technologies



EU certification system concerning F-gases

- In the European Union, there is **no common system** for central training, certification, attestation or qualification system with regard to F-gases,
- Instead, there are **common minimum requirements** that:
 - are laid down in the **EU legislation**
 - must be followed **by all Member States**
- **Mutual recognition:** Each Member State must recognize the F-gas certificates or attestations issued in another Member State.



<https://www.contractingbusiness.com>



Rijkswaterstaat
Ministerie van Infrastructuur en Waterstaat

Certification on natural refrigerants in the Netherlands

Transition to government regulation

Martijn Hildebrand
October 25th 2023

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Content

- Market based situation (current)
- Revision of the EU FGAS Regulation
- Government regulated (transition)



Current situation market based - ACB

- **A**mmonia, **C**O₂ and **B**urning (Flammable)
- Professional competence requirement
- Validity 5 years
- Self-regulated (but based on legal requirement)
- Knowledge and skills
- Differentiation based on refrigerant charge (**B&C**)
- Training institutions
- Examination institutions



New EU FGAS Regulation

- Political deal (October 5th)
- Voting in European Parliament and Council
- Entry into force +/- Q1 2024
- Training and certification for natural alternatives
- Obligation for natural persons and companies
- Implementing Acts (minimum requirements)
- Safe handling
- Refreshment training/ Evaluation process
- Notification
- Mutual recognition

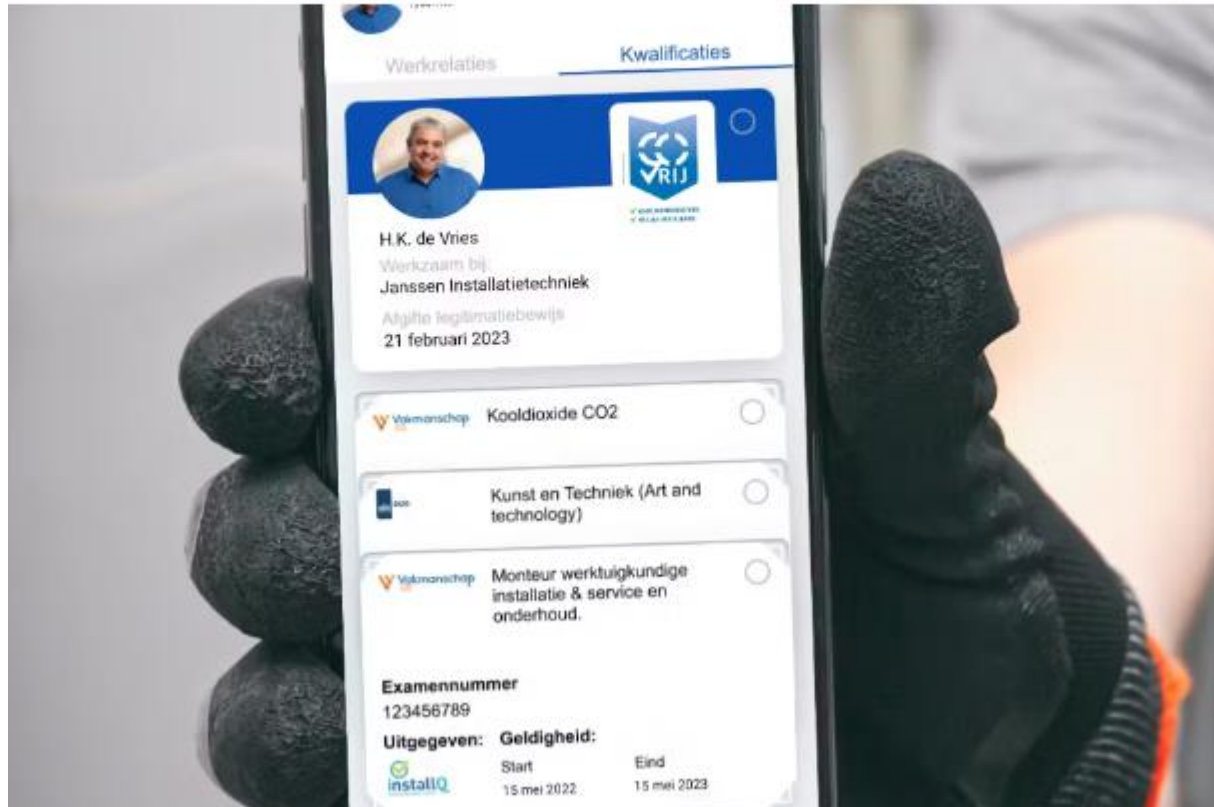


Government regulated (to be developed)

- Governmental scheme management
- Common examination commission
- Central registration of certificates (market)
- Quality management of skills and knowledge
- Assessment guidelines (persons/ companies)
- Certification institutions
- Audits



App 'Technical passport'



Spain: Legally Required Training on Alternative Refrigerants

Background

- 2017 legislation requires all air conditioning and refrigeration professional technicians to undergo a mandatory retraining in low GWP alternatives
 - Minimum of 6h of training by February 20th, 2021
- Part of a national strategy to decrease dependency on high GWP F-Gas regulated refrigerants
- Collaboration between Ministry of Environment and National Confederation of Installers to provide an accessible, high quality training solution



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Spain: Legally Required Training on Alternative Refrigerants

Required competencies related to F-gases & natural refrigerants



- **Refrigerator professionals:** *same as for F-Gases*
 - Charging, recovery and recycling of refrigerant fluids and lubricants in refrigeration installations,
 - Requirements and procedures for management, storage and transportation,
 - Safety rules and regulations for use, storage and transportation of flammable/ toxic refrigerants or refrigerants requiring greater operating pressure

- **AC and heat pump professionals:** *extra requirements for alternative refrigerants*
 - Designs of systems to reduce the gas load of GHGs and increase energy efficiency
 - Rules and safety regulations relevant for use, storage and transportation of flammable or toxic refrigerants, or refrigerants that require higher operating pressure
 - (dis)advantages, especially in relation to efficiency of alternative refrigerants depending on intended application and climatic conditions

Spain: Legally Required Training on Alternative Refrigerants

Challenges

- Breaking with a professional 'tradition' where F-gases are considered as 'safe' and not damaging refrigerants
- Only in few cases, training centers organised full day trainings at a reasonable cost
- Costs for trainings to be covered by companies
 - Big companies applied very early (2017/2018)
 - Limited availability of courses shortly before end date for certified professionals/individuals (February 20, 2021)



Certification System Regarding Fluorinated Greenhouse Gases and Legislative Application in Türkiye within the Scope of the Kigali Amendment

Dr. Veysel Selimođlu, Engineer NOU Türkiye, Directorate of Climate Change

25.10.2023

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Certification System
Regarding to Fluorinated Greenhouse Gases
And
Legislative Application in Türkiye
within the Scope of the Kigali Amendment

Dr. Veysel SELİMOĞLU
Directorate of Climate Change

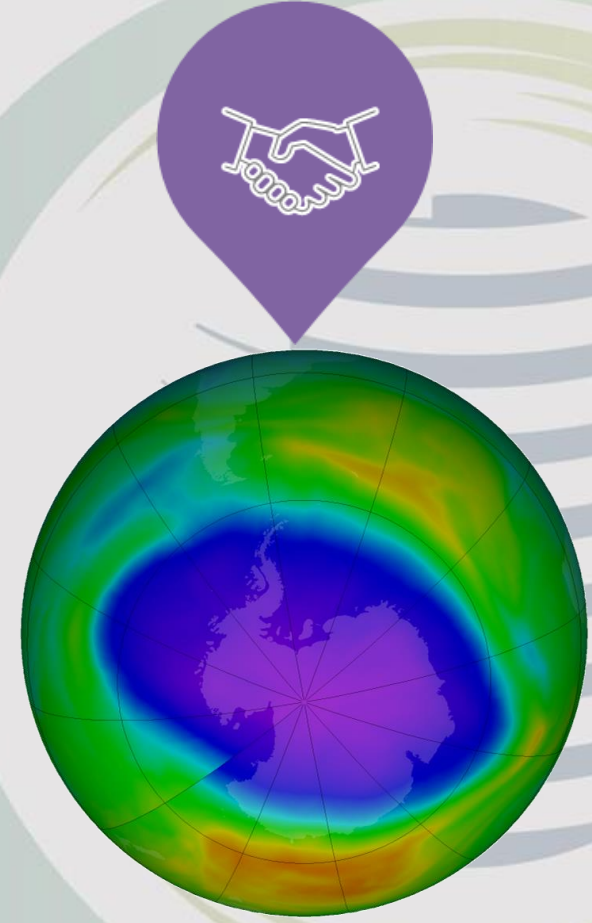


Outline Of The Presentation

- Brief Overview
- Certification System
- F-gas Management Database
- Training of RAC Technicians



- Türkiye has been a party to the Vienna Convention and Montreal Protocol on Ozone-Depleting Substances (ODS) since 1991.
- On 10 November 2021, Türkiye ratified the Kigali Amendment and entry into force on 8 February 2022.



The 2021 Antarctic ozone hole reached its maximum area on Oct. 7 and ranks 13th largest since 1979.
Credits: NASA Ozone Watch



Restructuring process

The "Ministry of Environment and Urbanization of the Republic of Turkey" has been re-named as the "Ministry of Environment, Urbanization and Climate Change of the Republic of Türkiye" and the 'Directorate of Climate Change' has been established through the relevant Presidential decree enacted in November 2021



Montreal Protocol

Türkiye is among in the Group 1 of the Article 5 in the developing countries category



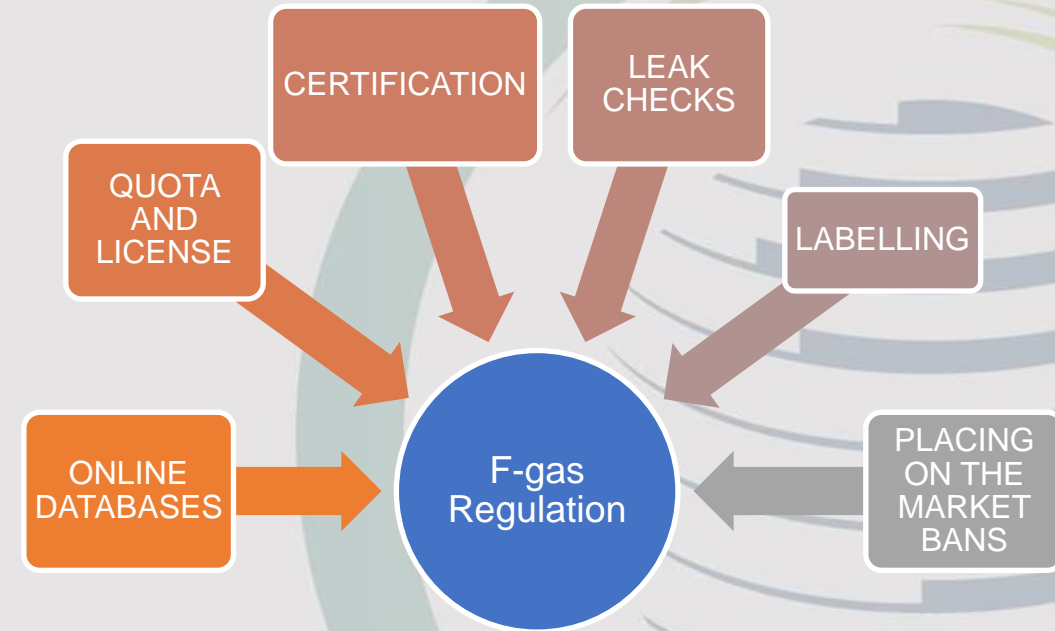
Legislation on Fluorinated Greenhouse Gases

- Regulation on Fluorinated Greenhouse Gases – 2022
- Circular on Management of Fluorinated Greenhouse Gases-2023
- Communiqué on Certification of Natural and Legal Persons Handling Equipment Containing Fluorinated Greenhouse Gases or whose Functioning Relies upon These Gases – 2020



In a nutshell, what did the new regulation bring?

- Prohibition of sale to real and legal persons
- Recovery obligation
- Quota system for HFCs
- Central database (FARAVET-EKOMVET)
- Procedures and principles regarding the import and export of HFCs per shipment
- Equipment leakage checks (in tonnes of CO₂ equivalent)
- Marketing and usage prohibitions
- Trade restrictions
- Training and certification





Certification system

- Legal entities-Technical services
- Natural persons-Technicians

Aim

- Constitute a qualified workforce in the market
- Prevention of leaks
- Recording the gas flow



Certification of Those Who Handle Equipment Containing or Operating Based on Fluorinated Greenhouse Gases (Natural Persons)

Vocational Qualifications Authority

- Refrigeration and Air Conditioning and Heat Pump
- Electrical switchgear
- Fluorinated greenhouse gas-based solvents
- Fire protection system
- Refrigerated trailer



5159 technicians have been certified by the VQA



Certification of those who Handle Equipment Containing or Operating Based on Fluorinated Greenhouse Gases (Legal Entities)

**Turkish
Standards
Institution**

- Refrigeration and air conditioning
- Electrical switchgear
- Fire protection system





F-gas and Equipment Containing F-gas Management Database

-EKOMVET

-FARAVET



F-Gas Equipment Operators Central Database (EKOMVET)

Requirements;

- Contains fluorinated greenhouse gas
- > 5 ton CO₂eq or,
- > 6 kg electrical switchgear containing sulfur hexafluoride (SF₆)

Equipment Activity Records;

- Only certified technical personnel may handle the equipment.
- Equipment Logbooks can only be made by the Equipment Operator.
- Certified technical personnel must approve the activity through the system.

4377 equipment logbooks registered and 372 activities recorded.



Activity Report Database (FARAVET)

Requirements;

- Registration via FARAVET
- Licensing per import/export
- Quota Allocation and Monitoring
- Annual reporting





• Training of RAC Technicians on HFCs





• Training of RAC Technicians on HFC Alternatives





REPUBLIC OF TÜRKİYE
MINISTRY OF ENVIRONMENT,
URBANIZATION AND CLIMATE CHANGE



**DIRECTORATE of
CLIMATE CHANGE**



THANK YOU FOR LISTENING

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Improving technician qualification and challenges to formal certification

**Madi Sakande,
U-3ARC Union of Associations of African Actors in Refrigeration and
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Q&A



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Upscaling Sustainable Cooling

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