# Fit for Green Cooling: Qualification, Certification and Registration of RAC technicians

23 July 2020 | 3:30-5:00 pm (CEST) Facilitators: Janna Breitfeld, Julia Schabel, Lara Teutsch (GIZ Proklima)

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH On behalf of



Federal Ministry for Economic Cooperation and Development Federal Ministry for the Environment, Nature Conservation and Nuclear Safety



#### Instructions

- Please leave your microphone and camera switched off.
- Write your questions in the chat.
- If there is not enough time to answer all questions, we will send an e-mail with the answers.
- This event will be recorded and published.
   With your participation you agree to this.



#### Objective

# How to successfully qualify, certify and register technicians in handling natural refrigerants?



- Overview of Fit for Green Cooling scheme
  - > First-hand experience

## Agenda

Proklima – Naturally Cool!	Janna Breitfeld, GIZ Proklima	
What is "Fit for Green Cooling"? Modules and Benefits	Lara Teutsch, GIZ Proklima	
Technical approach and standards – Interview with an expert	Rolf Hühren, HEAT	
Examples from the field: Getting fit for Green Cooling in Kenya	Marindany Kirui, NOU, Ministry of Environment and Forestry Juliet Cheruto Ngeiywa, GIZ	
Discussion: How can you benefit from "Fit for Green Cooling"?	All	
Closing	Lara Teutsch & Janna Breitfeld, GIZ Proklima	

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# What do you expect from this online event?

Please, write your answer into the chat!

# Proklima – Naturally Cool!

Janna Breitfeld, GIZ Proklima

# By 2030, the cooling sector will account for 13% of global greenhouse gas emissions.

## Switch to Green Cooling in one single step





- Programme established in 1995 in the context of implementing technical projects under the Montreal Protocol
- Promoting and introducing natural refrigerants and energyefficient appliances in the refrigeration and air-conditioning and foam (RAC&F) sector
- Supporting around 40 partner countries in the field of **integrated ozone and climate protection**

On behalf of



Federal Ministry for Economic Cooperation and Development



Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

## Green Cooling in action – what are we doing?

#### **Policy Advice**

Supporting evidence-based decision making for sustainable sector strategies

Example: Advancing NDCs (= nationally determined contributions) through climate-friendly cooling

#### **Capacity Building**

Training of >35.000 technicians within the HPMPs

Training of >150 cooling technicians, lecturers and political decision-makers within the Cool Training

#### **Technology Transfer**

Cooperation with the industry (e.g. production and distribution of climate-friendly ACs)

Example: JetWing Hotel Group in Sri Lanka







# What is "Fit for Green Cooling"? Modules and Benefits

Lara Teutsch, GIZ Proklima



### Background

 100 countries have ratified the Kigali Amendement and have committed themself to phase-down HFCs

The question is no longer **whether** countries will switch to climate-friendly refrigerants, but **how** they will

- Set up an institutional framework of public and pricate actors ensuring that RAC products and services meet defined requirements of established standardization, accreditation and conformity.
- Requires a scheme where technicians handling refrigerants can be qualified, certified and registered.





#### The need for a quality infrastructure

#### Reduce health-related risks

The introduction of new alternative refrigerants such as NH<sub>3</sub>, CO<sub>2</sub> or HCs is associated with a number of challenges, requiring extra training because of:

Flammability

Toxicity 🔥 High Pressure Systems 🦳

#### **Reduce Environmental Impact**

Improper installation and maintenance of cooling units can lead to:

- Less energy-efficiency
- Higher leakage rates of refrigerants ٠
- Breakdowns ٠
- Premature end of life of the systems
- $\rightarrow$  Greater direct and indirect emissions and higher costs

#### Increase Working Conditions

better job chances and better payments ٠



## Reasons to set up a QCR scheme



Proper qualification of RAC technicians minimises environmental and health-related risks, increases energy-efficiency and ensures the creation of a future-oriented workforce

**Certification** makes the level of knowledge of technicians measurable

**Registration** gives countries and companies an overview of trained workers and certification status

## **Our services**

#### (1) Qualification

- We provide a guideline with 14 theoretical and practical modules in accordance to international standards (EN 13313 and draft ISO/DIS 22712)
- We support national training institutes to integrate the modules into pre-existing curricula.
- We conduct "Trainings of the Trainers" and assist with the implementation.

#### (2) Certification

- We develop examination procedures.
- We build capacity of Certification Bodies.
- We develop materials, tools and instruments for certification processes.
- We assist with labelling, reporting and monitoring.

#### (3) Registration

- We identify registration needs of people, companies, products.
- We develop an R-scheme and investigate enforcement requirements.
- We assist with the development of materials, tools and instruments.
- We assist with reporting and monitoring.

## Fit for Green Cooling - Module Overview

Module A	Safe application of hydrocarbon refrigerants
Module B	Refrigerant circuit joining technologies
Module C	Safe application of carbon dioxide refrigerant
Module D	Safe application of ammonia refrigerant
Module E	Basic refrigeration, refrigerants & lubricants
Module F	Energy efficiency
Module G	Environmental protection
Module H	Electrical basics for refrigeration installations and safety
Module I	Design and testing of appliances and extensive systems
Module J	Refrigerant recovery, recycling, reclaim
Module K	Installation and commissioning
Module L	Operations & maintenance
Module M	Placing and mounting of RAC circuit components
Module N	Hermetisation (sealed system design)



- Practical and theoretical training sessions
- ✓ Trainer manual
- Chapter Material incl. Handbook & Handouts
- PPT Presentations
- ✓ Skills to assess
- Assessment Questions



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	Category	i (E	BA)	11 (	WK)	111	(FO)	IV (LE)			
	Requirements	Semi-Skille No Formal V	ed Worker ETC training	System Formal VE	Operator TC training	Craf Formal VI Refrigera	tsman ETC training nt Handling	Engineers / Operations Manager Refrigerant Handling			
		1 year professional field practice		2 years of professional field practice		4 years of professional field practice		Mechanical Engineering Studies or FO plus min. 4 years field practice		Fit for	
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	Sector	Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice	Green	
	<ol> <li>Placing and Mounting of RAC Circuit Components</li> </ol>	x	x							Cooling	
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	8. Professionals Module										
	3.1 Environmental Protection			×		×	_	x			
1	3.2 Refrigerants and lubricants			(×)		x		x		Certification	
3 3 3	3.3 Safety & Energy Efficiency Standards			×		x		x			
	3.4 Hermetisation (sealed system design)			(X)		x	x	x	x	Levels	
	3.5 Design and Testing of Appliances and Extensive Systems							x		according to EN 13313 Annex A	
	3.6 Installation and Commissioning			(X)		×	×	x	x		
ľ	3.7 Operations & Maintenance			x	x	x	x	x	x		
	3.8 Refrigerant recovery, recycling, reclamation			(X)		×	x	x	x		
	3.9 Safe application of NatRef – HC / CO <sub>2</sub> / NH <sub>3</sub>			(X)		x	x	x	x		
I	3.10 Electrical parts, installations, safety			x	x	x	x	x	x		
4.	I. Chiller		3.5								
Γ	4.1 Planning and Installation			(X)		x	x	x	x		
ſ	4.2 Commissioning			(X)		x	x	x	x		
t	4.3 Operations & Maintenance			×	x	x	x	x	x		
	<ul> <li>Re-evaluation and Renewal of Training Certificate (after several years of certificate holding)</li> </ul>			x		x	x	x	x		
6.	5. Optional Module Extensions										
	6.1 Basic Knowledge in Thermodynamics → M3 (in case not already available with II, III, IV)			×		×		×			
	6.2 System/failure evaluation/trouble- shooting →M3			x	(X)	x	x	×	x		
	6.3 Solar driven RAC / Application of solar cooling systems							x			
_	Assessment	1	4		В		с		D		
	Certificate	Ca	it I	Ca	at II	Ca	at III	Ca	t IV		

## Standards as general reference

- EN 378-1-4 (2000, last rev.2017): Refrigerating systems and heat pumps – Safety and environmental requirements:
- EN 13313:2010 Refrigerating systems and heat pumps Competence of personnel and ISO/DIS 22712 (draft) formulates the minimum requirements for Competence of Personnel reflecting applicable Industry Standards and, if applied, secures general quality of competences for personnel
- EN 50110 Operation of electrical installations Part 1: General requirements
- ISO 13585-2012 Brazing Qualification test of brazers and brazing operators or equivalent
- European F-Gas Regulation 517/2014
   CIR 2015/2067
   Reg. 1516/2007 (Leakage Check)

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## **Characteristics and advantages of Fit for Green Cooling**

- Holistic approach
- Modular structure of the training courses
- Compliance with international standards:
  - industry standards such as EN378, ISO 5149 and EN13313
  - makes the concept internationally viable and comparable
- High adaptability:
  - Can be integrated in existing, country-specific structures and curricula



## Selection of GIZ assisted Training and Certification

- GIZ assists training & certification schemes on
  - 1. Hydrocarbon: Costa Rica, Indonesia, Ghana, Kenia, Mauritius, Namibia, Papua New Guinea, Seychelles, Zimbabwe
  - 2. CO<sub>2</sub>: Kenia
  - 3. Best Practice: Zambia, Iran
- GIZ provides relevant training programmes in:
  - Brazil, India, Iran, Mauritius, Colombia, Mexico, Thailand
- GIZ assisted relevant certification of products/installations:
  - Brazil (WEEE), China (VDE), India (CE), Iran (TUEV)
  - Iran, Algeria, India, China + others (high pressure equipment + others)



# Technical approach and standards – Interview with an expert

Rolf Hühren, HEAT

#### Technical approach and standards – Interview with Rolf Hühren, Senior technical advisor, HEAT

- 1. What is special about Fit for Green Cooling from the perspective of a cooling technology expert?
- 2. Which main aspects were considered in the development of the modules and which country experience were involved?
- 3. What are typical barriers to the introduction of such schemes in the RAC sector and how will that be addressed?
- 4. Which (direct and indirect) benefits do occur when implementing Fit for Green Cooling ?









## Examples from the field: Getting fit for Green Cooling in Kenya

Marindany Kirui, NOU, Ministry of Environment and Forestry Juliet Cheruto Ngeiywa, GIZ Proklima

## Examples from the field: Getting fit for Green Cooling in Kenya



Marindany Kirui, NOU, Ministry of Environment and Forestry

Which benefits do you see as an NOU when implementing "Fit for Green Cooling"?

Is there a need for Qualification, Certification and Registration in Kenya's RAC Sector?



Juliet Cheruto Ngeiywa, GIZ Proklima Kenya

How can "Fit for Green Cooling" be integrated in the existing NDC process?

Which actors will benefit in what way by introducing "Fit for Green Cooling"?

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# How can you benefit from "Fit for Green Cooling"?

Feel free to write your questions into the chat!





Lara Teutsch, GIZ Proklima



Rolf Hühren, HEAT

Marindany Kirui, NOU, Ministry of Environment and Forestry



Juliet Cheruto Ngeiywa, GIZ Proklima Kenya

## What was the most important insight you received in today's online event?

Please, write your answer into the chat!

# Closing

Lara Teutsch, GIZ Proklima



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Thank you!



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