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)
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

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

➢ Appliances with natural refrigerants with same or better energy efficiency
Proklima

- Programme established in 1995 in the context of implementing technical projects under the Montreal Protocol

- Promoting and introducing **natural refrigerants and energy-efficient 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**
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 themselves 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 private 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.

A quality infrastructure is needed
The need for a quality infrastructure

Reduce health-related risks

The introduction of new alternative refrigerants such as NH₃, CO₂ 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
- Breakdowns
- Premature end of life of the systems

→ Greater direct and indirect emissions and higher costs

Increase Working Conditions

- better job chances and better payments
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

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

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

Hydrocarbon Training Manuals: Thailand and Iran
### Fit for Green Cooling Modules

**Certification Levels according to EN 13313 Annex A**

<table>
<thead>
<tr>
<th>Category</th>
<th>I (IA)</th>
<th>II (WK)</th>
<th>III (F)</th>
<th>IV (LE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Requirements</td>
<td>Semi-Skilled Worker</td>
<td>System Operator</td>
<td>Craftsmen</td>
<td>Engineers/Operations Manager</td>
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<tr>
<td>No Formal VETC training</td>
<td>Formal VETC training</td>
<td>Formal VETC training</td>
<td>Refrigerant Handling</td>
<td>Refrigerant Handling</td>
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<tr>
<td>1 year professional field practice</td>
<td>2 years of professional field practice</td>
<td>4 years of professional field practice</td>
<td>Mechanical Engineering Studies or F/O plus min. 4 years field practice</td>
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#### Sector

<table>
<thead>
<tr>
<th>Domestic and Commercial RACHP</th>
<th>Theory</th>
<th>Practice</th>
<th>RACHP</th>
<th>Theory</th>
<th>Practice</th>
<th>RACHP</th>
<th>Theory</th>
<th>Practice</th>
<th>All Sectors</th>
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<tbody>
<tr>
<td>1. Placing and Mounting of RAC Circuit Components</td>
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<td>2. Brazers Competences</td>
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<td>3. Professional Module</td>
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<td>3.1 Environmental Protection</td>
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<td>3.2 Refrigerants and lubricants</td>
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<td>3.3 Safety &amp; Energy Efficiency Standards</td>
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<td>3.4 Hermetisation (sealed system design)</td>
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<td>3.5 Design and Testing of Appliances and Extensive Systems</td>
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<td>3.6 Installation and Commissioning</td>
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<td>3.7 Operations &amp; Maintenance</td>
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<td>3.8 Refrigerant recovery, recycling, reclamation</td>
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<td>3.9 Safe application of NetRel - HC / CO2 / NH3</td>
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<td>X</td>
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<td>3.10 Electrical parts, installations, safety</td>
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<td>4. Chills</td>
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<td>4.1 Planning and installation</td>
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<td>4.2 Commissioning</td>
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<td>4.3 Operations &amp; Maintenance</td>
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<tr>
<td>5. Re-evaluation and Renewal of Training Certificate (after several years of certificate holding)</td>
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<td>6. Optional Module Extension</td>
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<tr>
<td>6.1 Basic Knowledge in Thermodynamics → M3 (in case not already available with II, III, IV)</td>
<td>X</td>
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<tr>
<td>6.2 System/Failure evaluation/trouble-shotting → M3</td>
<td>X</td>
<td>(X)</td>
<td>X</td>
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<td>X</td>
<td>X</td>
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<td>6.3 Solar driven RAC / Application of solar cooling systems</td>
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<tr>
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<th>B</th>
<th>C</th>
<th>D</th>
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<td>Certificate</td>
<td>Cat I</td>
<td>Cat II</td>
<td>Cat III</td>
<td>Cat IV</td>
</tr>
</tbody>
</table>
Standards as general reference

- **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)
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. CO₂: 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
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

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?

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“?

Marindany Kirui, NOU, Ministry of Environment and Forestry

Juliet Cheruto Ngeiywa, GIZ Proklima Kenya
How can you benefit from “Fit for Green Cooling”?

Feel free to write your questions into the chat!
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
Dig deeper:

twitter.com/GCIGreenCooling

www.green-cooling-initiative.org

Thank you!