

Virtual & Reality: the qualification programmes "Cool Training" and "Fit for Green Cooling"

OEWG44 side event, Bangkok Thailand

14 July 2022



On behalf of



Federal Ministry
for Economic Cooperation
and Development



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

Agenda

Welcome Remarks	Sebastian Schnatz, German Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection
Introduction on the relevance of Qualification, Certification and Registration in the RAC Sector	Video
Cool Training: <ul style="list-style-type: none">• online course• face-to-face trainings	Kerstin Kreß, GIZ Proklima
Fit for Green Cooling <ul style="list-style-type: none">• concept, modules and availability• First-hand impressions from partner countries	Lara Teutsch, GIZ Proklima
Questions & Answers	All participants
Conclusion and Closing Remarks	Bernhard Siegele, GIZ Proklima

Welcome Remarks

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



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

Introduction on the relevance of Qualification, Certification and Registration in the RAC Sector

Video, English:

<https://youtu.be/W2FT1qrAH5M>

Video, Español:

https://youtu.be/cCng_8Gr2Ko

Video, Français:

<https://youtu.be/UYKs3WEgwEU>

BUNDESFACHSCHULE
Kälte | Klima | Technik



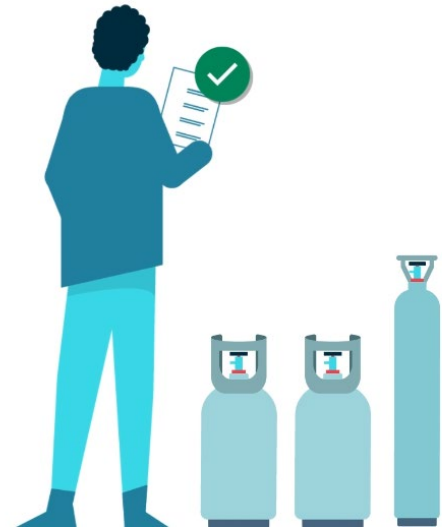
Cool Training

Kerstin Kreß, GIZ Proklima

giz Deutsche Gesellschaft
für Internationale
Zusammenarbeit (GIZ) GmbH

Cool Training – objective

Enabling the spread of **Green Cooling** technologies worldwide by providing training on the **safe handling of natural refrigerants** to technicians, trainers and decision-makers.

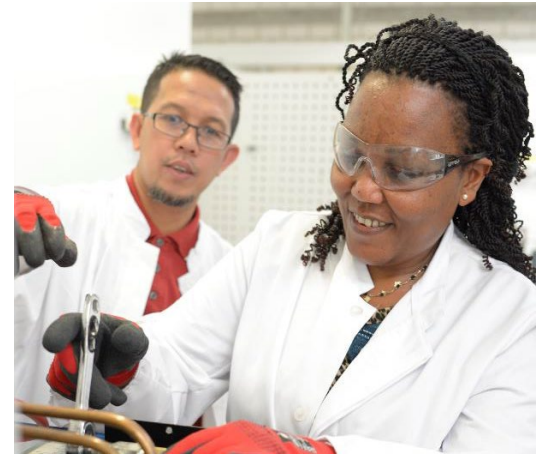


Cool Training – general information

- Cooperation with the technical training institute BFS



- Face-to-face trainings in Maintal, Germany since 2014
 - Two weeks for technicians or RAC trainers
 - One week for NOUs
- Online trainings on www.atingi.org since 2022
 - Obligatory for participants of the on-site training
 - Open to everybody
 - Free of charge
 - Available languages: English, Spanish, French



Online course on www.atingi.org



HOME CONTENT LIBRARY MY CERTIFICATES LIVE SESSIONS FAQ'S



Welcome to the Cool Training online course!

Bienvenus au cours en ligne Cool Training !

¡Bienvenidos al curso de formación online Cool Training!

Introduction



Cool Training – Part 1: Refrigeration Basics



Progress: 50%

Cool Training – Part 2: Natural Refrigerants



Progress: 50%

Additional Material



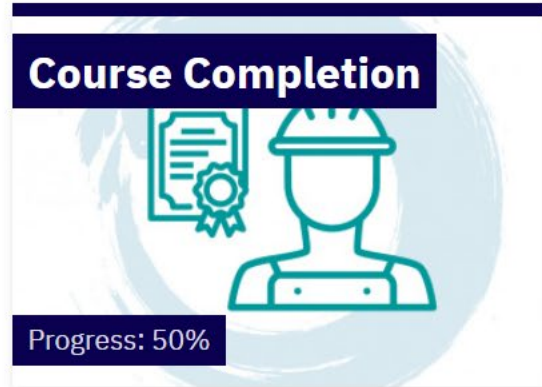
Progress: 0%

Webinars



Progress: 0%

Course Completion



Progress: 50%

Cool Training – Part 1: Refrigeration Basics

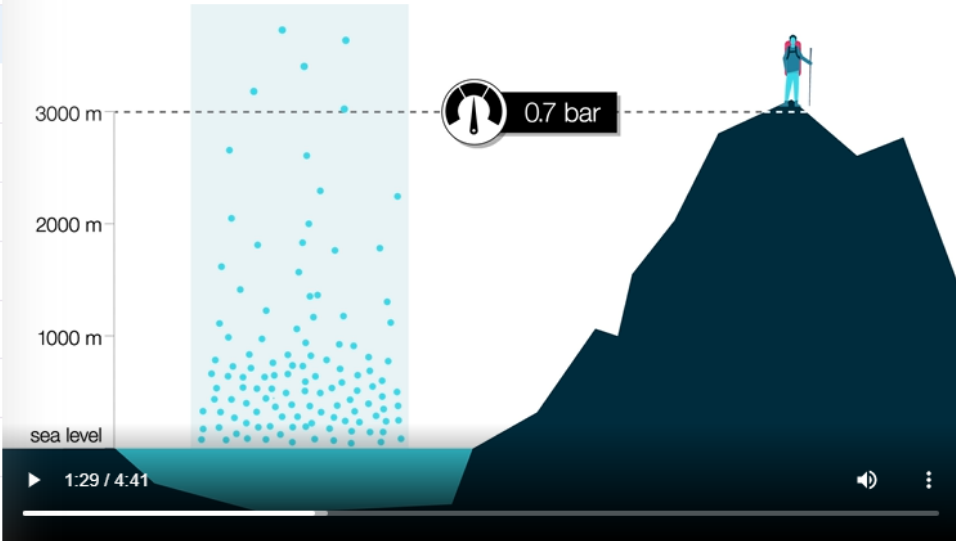
Done: View

☰ 1. The interaction between temperature and pressure 2 / 9 < > ⌕

Cool Training

- Introduction ●
- 1. The interaction b...** ●
- 2. Determining the ... ○
- 3. Determining the ... ○
- 4. Choosing the ap... ○
- 5a. Structure of pre... ○
- 5b. Refrigeration cy... ○
- 6. Factors influenci... ○
- End of part 1 ○

In this video, you will learn about the basic characteristics of pressure and temperature and how both variables interact.



3000 m

2000 m

1000 m

sea level

0.7 bar

▶ 1:29 / 4:41 🔊 ⋮



Cool Training

Introduction ●

1. The interaction b... ●

2. Determining the ... ○

3. Determining the ... ○

4. Choosing the ap... ○

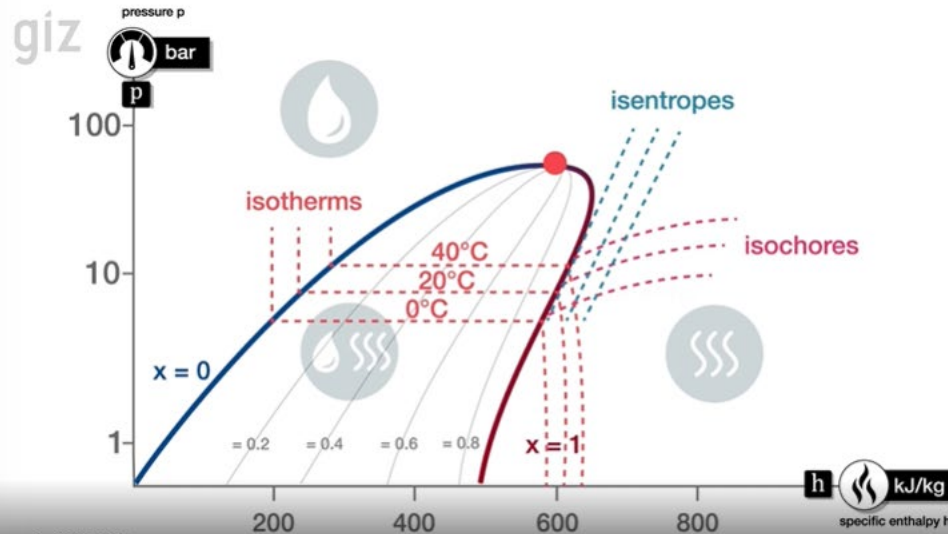
5a. Structure of pre... ●

5b. Refrigeration cy... ○

6. Factors influenci... ○

End of part 1 ○

The pressure-enthalpy diagram describes the compression refrigeration cycle. Watch this video to learn what information the diagram contains.



▶ 5:16 / 5:40

Cool Training – Part 2: Natural Refrigerants

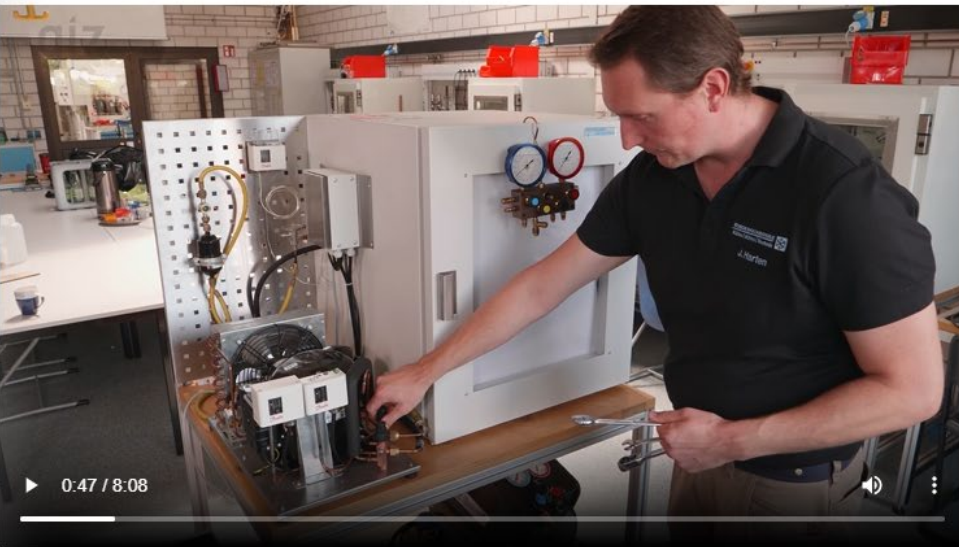
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☰ 10. Basic skill set for proficient manual work on RAC systems 6 / 13 < > ✕

Cool Training

- Introduction ●
- Excursion ○
- 7. Properties and cl... ○
- 8. Copper tube han... ●
- 9. Leak detection m... ●
- 10. Basic skill set f... ●**
- 11. Propane (R290) ... ○
- 12. Ammonia (R717... ○
- 13. Carbon dioxide ... ○
- 14. Application of c... ●
- 15. Factors influenc... ○
- 16. Electrical safety ○

This video explains the basic skills technicians need to work with cooling systems.



A technician in a black polo shirt is working on a refrigeration unit in a workshop. The unit is white and has various gauges and pipes. The technician is using a tool to work on the unit. The video player shows a progress bar at 0:47 / 8:08.

Cool Training Online Course

Certificate of Attendance

Kerstin Kress

successfully participated in the online training

Refrigeration Basics
Focus: Natural Refrigerants
Propane (R290), Carbon Dioxide (R744)
and Ammonia (R717)


Quiz question - example

Question 15

Not yet
answered

Marked out of
1.00

 [Flag
question](#)

 [Edit
question](#)

What are the advantages of R290 compared to R404A?

Select one or more:

- very small global warming potential
- higher energy efficiency
- ozone friendly

[PREVIOUS PAGE](#)


Quiz question - example

Question 15

Not yet
answered

Marked out of
1.00

 [Flag
question](#)

 [Edit
question](#)

What are the advantages of R290 compared to R404A?

Select one or more:

- very small global warming potential
- higher energy efficiency
- ozone friendly

[PREVIOUS PAGE](#)


Quiz question - example

Question 22

Not yet
answered

Marked out of
1.00

 [Flag
question](#)

 [Edit
question](#)

What happens at the critical point?

Select one or more:

- The refrigerant is destroyed
- Liquid and vapour have the same density
- The liquid freezes


Quiz question - example

Question 22

Not yet
answered

Marked out of
1.00

 Flag
question

 Edit
question

What happens at the critical point?

Select one or more:

- The refrigerant is destroyed
- Liquid and vapour have the same density
- The liquid freezes

Live Webinars for answering questions

Next dates:

- English with **French** interpretation:
 - 19 July – part I
 - 20 July – part II
 - Time: 9h UT
- **English** only:
 - 20 September – part I
 - 22 September – part II
 - Time: 7h UT



How to access the online Cool Training?

1. register on www.atingi.org
2. Search for “cool training”



3. Choose the course in your preferred language

Cool Training (English)

WELCOME TO THE COOL TRAINING ONLINE COURSE! WHAT IS about the characteristics and advantages of climate-friendly nat
Cool T EN
[View this result in context - in course Cool Training \(English\)](#)

Cool Training (Español)

El curso en línea Cool Training a su propio ritmo de GIZ Proklime naturales respetuosos con el clima. En el núcleo de cada sección
Cool T ES
[View this result in context - in course Cool Training \(Español\)](#)

Cool Training (Français)

Le cours à rythme libre en ligne Cool Training de GIZ Proklime respectueux du climat. Au cœur de chaque section se trouve un
Cool T FR
[View this result in context - in course Cool Training \(Français\)](#)



Questions? Problems?

Write an e-mail to cool.training@giz.de

Experiences from the on-site training

Fit for Green Cooling

Qualification, Certification and Registration of RAC technicians

Lara Teutsch, GIZ Proklima



Background

- **135** countries have ratified the Kigali Amendment

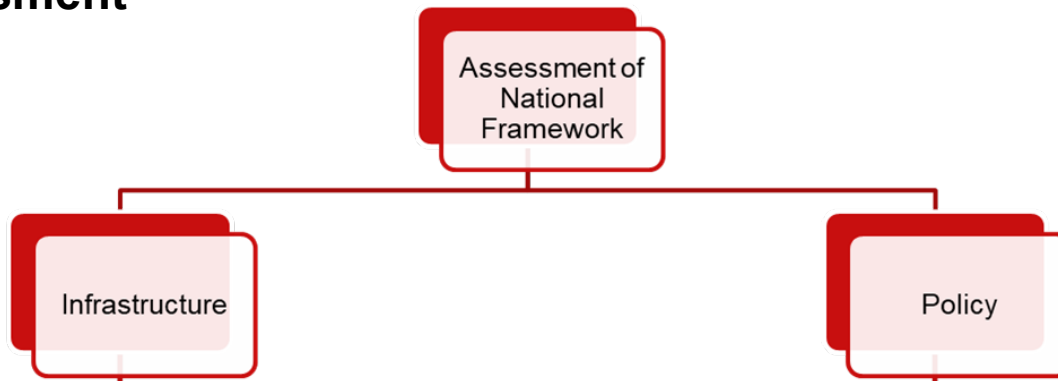


The question is no longer **whether** countries will switch to climate-friendly refrigerants, but **how** they will.

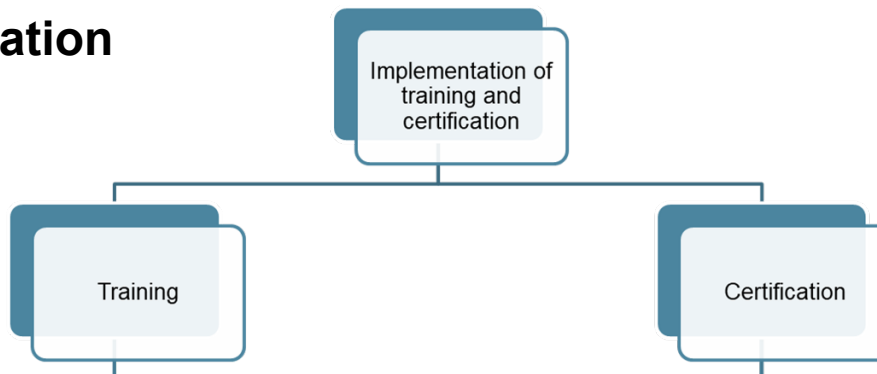
- RAC qualification & certification systems need to be updated:
 - to **comply with MP/KA requirements and requirements for further funding**
 - enable **market-uptake of low-GWP refrigerants and high energy-efficient technologies**
 - Contribute to **achieving NDCs**



Step 1: Assessment



Step 2: Implementation



No need to start from scratch...

The following sources of materials can support the process of setting up a QCR system in a country

- **International standards and norms**
 - Technical standards, e.g., on product safety or environmental requirements from the International Standardisation Organisations (ISO) and the International Electrotechnical Commission (IEC).
- **National regulations and other existing structures** e.g. the national TVET framework as well as structures on safety and environmental protection in the RAC sector
- **Examples from the European Union**
 - EU F-Gas regulation introduces a standardised qualification and certification of personnel and companies who carry out installation, servicing, maintenance, repair or decommissioning of RAC equipment containing f-gases and introduces four levels of competence and defines minimum requirements for these
- **The GIZ “Fit for Green Cooling” material**

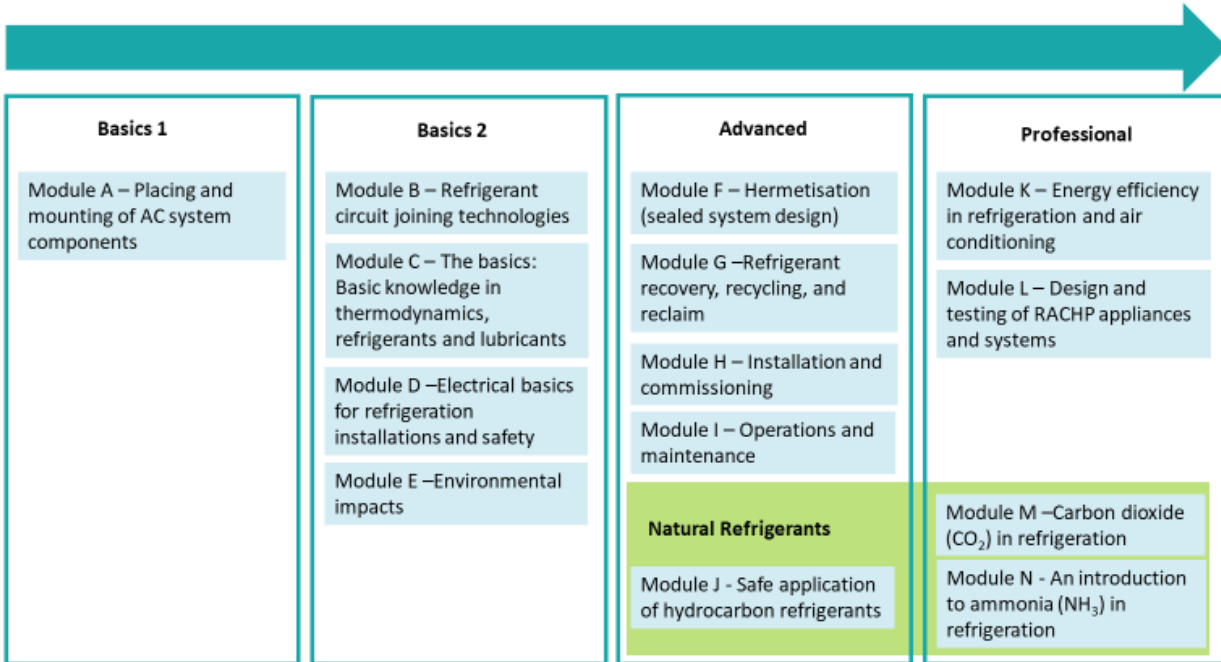
Standards as general reference

- 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)*



DEUTSCHE NORM		Februar 2011
DIN EN 50110-2 (VDE 0105-2)		
<small>Diese Norm ist zugleich eine VDE-Bestimmung im Sinne von VDE 0022. Sie ist nach Durchföhrung des vom VDE-Präsidium beschlossenen Genehmigungsverfahrens unter der oben angeführten Nummer in das VDE-Vorschriftenwerk aufgenommen und in der VDE-Elektrotechnik - Automaten bekannt gegeben worden.</small>		
DEUTSCHE NORM		Februar 2011
DIN EN 13313		nd jung 1 g 1):2001-07
KS 27.048: 27.200		DIN EN ISO 13585
Kälteanlagen und Wärmepumpen – Sachkunde von Personal; Deutsche Fassung EN 13313:2010		ISO 13585:2012 Qualification test of brazers and brazing operators (ISO 13585:2012, English translation of DIN EN ISO 13585:2012-10)
BRITISH STANDARD	BS EN 378-1:2008 + A2:2012 Refrigerating systems and heat pumps — Safety and environmental requirements December 2008	DRAFT INTERPRETATION
Refrigerating systems and heat pumps — Safety and environmental requirements Part 1: Basic requirements, definitions, classification and selection criteria		
ISO/TC 86/SC 1 voting begins on: 2018-09-03		
and heat pumps		
chaleur — Compétence		
ICS: ISO ics		

Fit for Green Cooling - Module Overview



14 Modules each contain:

- The Handbook (theoretical basis)
- Trainer manual
- Handouts
- PPT Presentations
- Practical exercises
- Examination questions
- Skills to Assess for each level

Fit for Green Cooling

How can the modules be used for setting up a certification scheme?

- Use skills to assess and content of the modules to create a national standard for certification.
- Use practical and theoretical example exercises to guide examination set-up.

How can the modules be used for setting up or improving qualification measures?

- Use content to structure and write curricula.
- Use module content to design and teach courses in vocational training schools and institutes.
- Use modules to prepare for certification examinations (theoretical content).

Access and Guidance

[Website of the Green Cooling Initiative](#)

- All documents available for download for partner countries
- More Information: Guideline, Skills to assess and content of each module



Guideline:

- overview of the general concept and approach of QCR in the RAC sector
- step-by-step guidance to assess the status quo in a country
- points out useful information sources.

Basic Modules

Module A: Placing and mounting of A/C system components ^

Module A covers the placing and mounting of single split and window air conditioning (A/C) systems. You learn how to install A/C equipment and to prepare for commissioning, observing and applying occupational health, safety and accident prevention regulations, environmental protection, rational use of material resources and energy, and requirements of good airflows over A/C systems.

[Module A: Trainer & Student material](#)

Module B: Refrigerant Circuit Joining Technologies v

Module C: The Basics v

Module D: Electrical basics for refrigeration installations and safety v

Module E: Environmental Impacts v

Advanced Modules

Module F: Hermetisation / sealed system design v

Module G: Refrigerant recovery, recycling and reclaim v

Module H: Installation and commissioning v

Module I: Operations and Maintenance v

Module J: Safe use of hydrocarbon refrigerants v

Professional Modules

Module K: Energy efficiency in refrigeration and air conditioning v

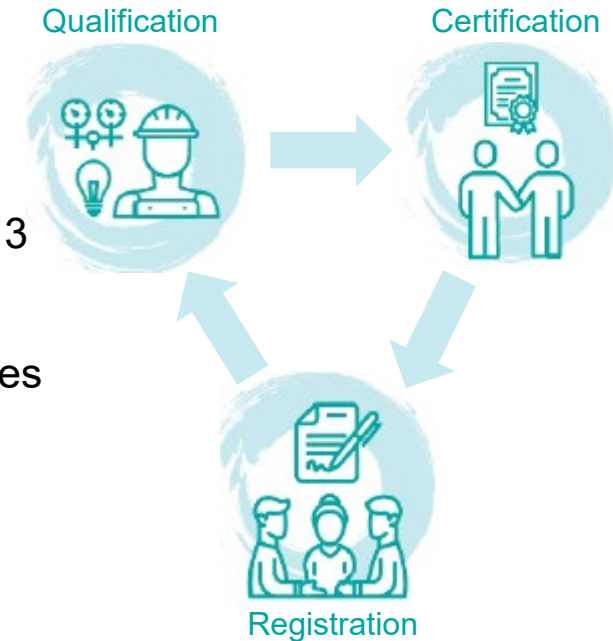
Module L: Design and testing of RACHP appliances and systems v

Module M: Carbon Dioxide (CO₂) in Refrigeration v

Module N: An introduction to ammonia (NH₃) in refrigeration v

Characteristics and advantages of Fit for Green Cooling

- Covers all required skills to work with Green Cooling technologies
- Compliance with international standards:
 - industry standards such as EN378, ISO 5149 and EN13313
 - makes the concept internationally viable and comparable
- Modular structure and high adaptability of the training courses
 - Can be integrated in existing, country-specific structures and curricula
 - Training levels in accordance to individual competences (e.g. upskilling training)
 - Flexible usage (long or short term interventions)
 - makes it easier to include training on the job or upskilling technicians in the informal sector





Our aim: To significantly reduce emissions in small food retail and accelerate the transition to natural refrigerants

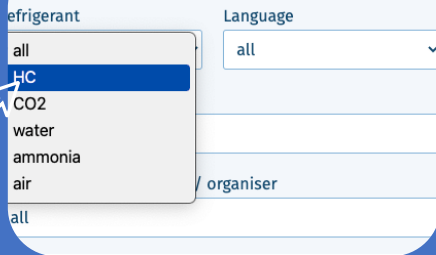
Our free tools:

and start the course →



Free, self paced
**online training
courses** & webinars
for store owners and

ENTER RESULTS



EU training **course
provider database**
for technicians



Best practice **case
studies & guidance
documents**

And more coming up!

- Criteria & **benchmark tool** for store owners
- **Product finder** for sustainable RACHP store equipment



The RefNat4LIFE Project has received funding from the EU LIFE Programm



Visit the project website
www.refnat4life.eu



Contact us at info@refnat4life.eu

Country Experiences

Closing

Bernhard Siegele
Programme Manager GIZ Proklima



Green Cooling Network

- aims to promote green cooling technologies
- connects key players in the RAC sector such as gov't institutions, international organizations, and the private sector
- provides information, advice and collaboration opportunities to its members
- members are all committed to green cooling

Join the Green Cooling Network today!

www.green-cooling-initiative.org/network



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