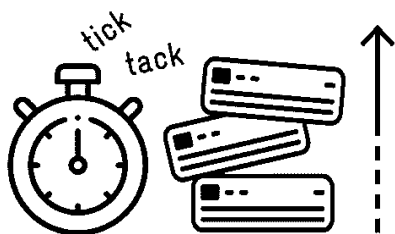




Fit for Green Cooling

How to qualify, certify and register the RAC workforce of the future

The need for cooling is rising drastically – especially in developing countries. Demographic change is increasing the need for cooling in buildings, as well as for food and medicines. The world population continues to grow, and more and more people are drawn to live in cities.



10 ACs will be sold every second for the next **30 years**

Densely-populated areas, modern construction methods and improved standards of living lead to an increase in demand for comfort cooling. The standard of living is also rising outside of cities, and more refrigerators are being used as a result.

The increasing demand for cooling means that more and more Refrigeration and Air Conditioning (RAC) technicians are needed, especially in developing countries. However, due to more complex systems and higher environmental, energy and safety standards, these technicians must be very well trained. In countries with insufficient training infrastructures, most of the workers come from the informal sector. The installation and maintenance of cooling units often does not correspond to best practices in terms of environmental protection, safety and efficiency.

A variety of risks arises:

Environmental risks

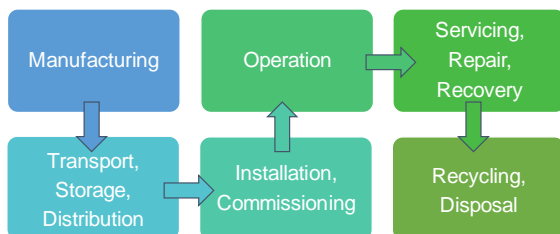
Improper installation and maintenance of cooling units can lead to less energy-efficiency, higher leakage rates of refrigerant, breakdowns and premature end of life of the systems. This results in greater direct (refrigerant leakage) and indirect emissions (energy consumption) and higher costs for the operator or user. A better trained workforce has a direct impact on the reduction of emissions.

End-of-life emissions

It is important not only to evaluate the lifetime emissions, but also to consider the entire life cycle of an appliance. Many of the technicians do not recover the refrigerants before disposing of old devices. Due to improper disposal, climate-damaging refrigerants (HCFCs/HFCs) enter the atmosphere and thus damage the environment. Countermeasures should include raising awareness among technicians, making degassing machines more easily accessible, and establishing a suitable infrastructure for waste disposal.

Health-related risks

Due to the requirements of the Kigali Amendment, more and more natural refrigerants will be used in the future. They cause zero ozone depletion and have very low to no global warming potential. However, some of them require specific training due to their higher risks, e.g. flammability. These specific characteristics need to be dealt with throughout the value chain.



Value chain of cooling devices

Training on the use of natural refrigerants can help improve technicians' health, their working conditions and secure their incomes. Key elements in the successful transition to sustainable cooling technologies include the establishment of standards, an official training path, as well as the certification and registration of technicians country-wide.

The solution: a qualification, certification & registration scheme

The question is no longer **whether** countries will switch to climate-friendly refrigerants, but **how** they will. The Kigali Amendment to the Montreal Protocol commits its signatory states to reduce their HFC consumption and production to below 20% by 2047. In order to do so, countries must set up an institutional framework of public and private actors ensuring that RAC products and services meet defined requirements of established standardisation, accreditation and conformity. This requires a scheme where technicians handling refrigerants can be **qualified, certified and registered**.

To that end, Proklima developed "Fit for Green Cooling": a **holistic approach** which was developed according to **international standards** but **can be adapted** to national contexts and integrated in country-specific structures. Its scope covers natural refrigerants and helps reduce direct and indirect emissions over the lifetime and disposal of RAC appliances by setting standards that are followed by a skilled workforce. It thereby supports countries directly in their efforts to phase down climate-damaging HFCs.

About GIZ Proklima

GIZ Proklima stands for long-term partnerships and collaborations with over **25 years of experience** in the field and offers trainings on the safe use of climate-friendly natural refrigerants in the RAC sector – both in Germany and partner countries. The main target group of the established "Cool Training" includes RAC trainers and technicians as well as political decision makers from developing countries & emerging economies.

How does “Fit for Green Cooling” work?

Our services



(1) Qualification

- We provide a guideline with 15 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 “Training for the Trainers” and assist with the implementation.



(2) Certification

- We develop examination procedures.
- We help expand the 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.

A closer look: the training modules

The training consists of **14 modules** with theoretical and practical training sessions. The training institute receives trainer manuals for conducting the course and the practical exercises, supplementary material including a handbook and power point presentations for each chapter, an overview on skills to assess, module handouts and assessment questions.

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

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