

## Refrigerants, Naturally! for LIFE

### ACTION C4:

REFRIGERATION, AIR CONDITIONING AND HEAT PUMPS (RACHP) SCHOOL WITH MASSIVE OPEN ONLINE COURSES (MOOC) ON RACHP TECHNOLOGY, POLICY & MARKET

### RACHP School MOOC platform Concept

#### Course for RACHP technicians

<p>Course overview</p>	<p>This course introduces the topic of climate change and the role of the food retail sector. It provides an overview of climate-friendly cooling alternatives and shows approaches towards sustainable stores.</p> <p>The course is part of the Refrigerants, Naturally! for LIFE project and is complemented by a parallel course for owners of small food stores.</p>
<p>Objectives</p>	<p>The overall objective of this course is to create more awareness on urgent climate action and to encourage the use of natural refrigerants and energy efficiency improvements for climate-friendly cooling.</p> <p>The course will give an overview on climate change, the role of the small food retail sector in achieving legal requirements on emission reduction, technical solutions already available on the market, technical specifications for the use of these alternatives in small food retail shops and also on how to consult the small food retail shop owners on sustainable cooling. The course covers stand-alone (plug-in) appliances, remote appliances with split condensing units and appliances connected to a centralized system.</p>
<p>Target audience</p>	<p>This course is meant for RACHP technicians who would like to better understand how their business is linked to climate change and what they can do to actively contribute to reduce emissions. This course is especially helpful for RACHP technicians who want to actively develop their knowledge on natural refrigerants and would like to offer best customer services by advising and supporting store owners on their way to climate-friendly technical solutions for cooling appliances for food preservation, shop air conditioning and heating by heat recovery from refrigeration or by heat pumps. RACHP technicians can be self-employed or employed by servicing and/or contracting companies. As the focus is on small food retail stores (&lt; 1000 m<sup>2</sup>), the majority of such RACHP companies will be small, with relatively low levels of prior knowledge, and limited capabilities for implementing innovative technologies.</p>
<p>Course structure</p>	<p>This course is divided into 6 modules. Each module contains two to four lessons using multimedia presentations, texts and quizzes. The completion of each module requires about 15- 30 minutes. Additional time can be spent on studying the additional</p>

resources included in each lesson. The learning experience is more rewarding if the lessons are spread out over several days or weeks, therefore, an optimal learners' schedule will be suggested. All modules are independent from each other and can be done in accordance with the learners' skill-level and in alignment with his or her preferences. Therefore, there is no need to work on the modules one after another, but different entry points can be chosen.

## Module 1

### Introduction / Overview

- Module overview
- 1.1 Scope and objective of online course
- 1.2 Current situation of RACHP equipment in the European food retail sector
  - Climate target and what they mean for shop retailers
  - Options for GHG mitigation: Overall carbon footprint, options for lowering the energy consumption and the carbon footprint
  - Energy and refrigerant consumption of RACHP equipment, overview of system types and energy efficient cooling technologies for the food retail sector
- End of module quiz

## Module 2

### Climate change / global warming / energy efficiency

- Module overview
- 2.1 Climate change (and the role of supermarkets)
- 2.2 GHG footprint of the store
  - GHG protocol corporate standard: Scope 1,2 and 3 emissions
  - Direct and indirect emissions
  - Calculating Scope 1 and 2 emissions
  - Calculating the Total Equivalent Warming Impact (TEWI)
  - Climate impact of RACHP equipment in the store
- 2.3 Energy Efficiency
  - Understanding energy performance coefficients and calculating methods
  - Rating and Labelling
  - Relevance of servicing and consumer behavior for Energy Efficiency
- End of module quiz

## Module 3

### Legal requirements of relevance

- Module overview
- 3.1 Montreal Protocol, Kigali Amendment
- 3.2 Paris Agreement
- 3.3 European Green Deal
- 3.4 EU F-Gas Regulation
- 3.5 Relevant EU Directives (with a focus on the building directive)
- 3.6 National laws
- 3.7. Financial support schemes
- End of module quiz

<p>Module 4</p>	<p><b>Using natural refrigerants and safety aspects <sup>1</sup></b></p> <ul style="list-style-type: none"> <li>• Module overview</li> <li>• 4.1 Characteristics of natural refrigerants (ammonia, CO<sub>2</sub>, hydrocarbons)</li> <li>• 4.1 Safe handling of different natural refrigerants (ammonia, CO<sub>2</sub>, hydrocarbons) <ul style="list-style-type: none"> <li>○ Risk assessment</li> <li>○ Material safety data sheets</li> </ul> </li> <li>• End of module quiz</li> </ul>
<p>Module 5</p>	<p><b>System design, installation, operation <sup>2</sup></b></p> <ul style="list-style-type: none"> <li>• Module overview</li> <li>• 5.1 System design considerations for using natural refrigerants (ammonia, CO<sub>2</sub>, hydrocarbons)</li> <li>• 5.2 Containment and leak detection</li> <li>• 5.3 Safe installation</li> <li>• 5.4 Servicing for safe and efficient operation <ul style="list-style-type: none"> <li>○ Improving and maintaining energy performance</li> <li>○ Maintenance and repair of natural refrigerant systems</li> <li>○ What tools are required</li> </ul> </li> <li>• 5.5 Recovery and decommissioning of refrigerants and old equipment according to legal requirements</li> <li>• End of module quiz</li> </ul>
<p>Module 6</p>	<p><b>Communication with store owners</b></p> <ul style="list-style-type: none"> <li>• Module overview</li> <li>• 6.1 How to communicate with clients / customers <ul style="list-style-type: none"> <li>○ Advising on environmental topics</li> <li>○ Informing about the operation of RACHP</li> <li>○ Considering the customers wishes and needs</li> <li>○ Supporting in legally required documents / certificates</li> <li>○ Offering dedicated customer training on RACHP and environment</li> </ul> </li> <li>• 6.2 How to consult clients / customers on <ul style="list-style-type: none"> <li>○ Costs and opportunities on financial support</li> <li>○ Energy savings</li> <li>○ Safety aspects</li> <li>○ Maintenance planning</li> <li>○ The necessity of repairs and the exchange of components</li> <li>○ Switching to climate friendly cooling equipment</li> </ul> </li> <li>• 6.4 How to deal with customer complaints</li> <li>• End of module quiz</li> </ul>
<p>Further Readings</p>	<p>Module x:</p>

<sup>1</sup> Important safety aspects, relevant for natural refrigerants are provided and links to existing learning platforms

<sup>2</sup> Important aspects on system design, installation, operation, relevant for natural refrigerants are provided and links to existing learning platforms

	<p>List with links</p> <p>Other recommended online courses</p>
Course credits	This course has been developed under the EU Refrigerants, Naturally! for LIFE Project in partnership with shecco, AgroBio, BNN, SEAE, BIV, KNVvK and STEK, led by HEAT.
Contact us	<a href="http://www.refrigerantsnaturally.com/service/contact/">http://www.refrigerantsnaturally.com/service/contact/</a>
Course requirements	<p>This course will be delivered entirely online on an educational platform. In order to access online lessons, course materials, and resources an Internet connection (DSL, LAN, or cable connection desirable) is required.</p> <p>The activities will consist of video lectures, quizzes, texts and additional resources (videos, documents, audio, interactive websites).</p> <p>Prior general knowledge and experience on RACHP technology, design, contracting and servicing are required.</p>

January 2020

