

## Trainer Manual

### Environmental impacts - Module E

<b>Objectives:</b>	Participants acquire knowledge in: <ol style="list-style-type: none"> <li>1. Know about the general impact of RACHP technologies and the various sectors on the environment</li> <li>2. Learn about the environmental impact of refrigerants</li> <li>3. Acquire a common understanding of environmental influences such as ODP, GWP and CO2 equivalent</li> <li>4. Learn about regulative and technical policies that influence the RACHP sector and how this influences participants' work now and in the future</li> <li>5. Know the relevant alternative technologies to replace or to reduce the use of fluorinated greenhouse gases and about their safe handling</li> <li>6. Have a brief understanding of natural refrigerants and their applications for "Green Cooling" technologies</li> <li>7. Understand the respective advantages and disadvantages of natural refrigerants</li> </ol>	
<b>Course and duration of the presentations:</b>	E1 – Introduction	20'
	E2 – Environmental impact of refrigeration and related policies	20'
	E3 – Natural refrigerants - an overview	20'
	E4 – Practical implications for technicians	30'
	<b>TOTAL</b>	<b>90'</b>
<b>Material:</b>	PPT presentation, projector, white board	
<b>Demonstration equipment</b>	n.a.	
<b>Tools &amp; equipment:</b>	n.a.	

Each session contains several sub-sessions.

Please note that it is advisable to adapt each course according to specific local circumstances.

#### Abbreviations:

PPT: Presentation slides; TM: Trainer manual; HO: Handout; DM: Demonstration material

## Summary – Session Overview

Chapter: E1_Introduction				
Time	Content	Objectives	Training material / demonstration equipment	Description of training sessions and trainer notes
20'	E1 Introduction	<ul style="list-style-type: none"> <li>Know about refrigeration and its importance for human development</li> <li>Understand that refrigerants have an impact on the environment</li> </ul>	E_PPT_Environmental impacts  E_TM_Environmental impacts	<u>Plenary</u>  Trainer should start the session with questions regarding participants experience to assess previous knowledge: <ul style="list-style-type: none"> <li>What types of refrigeration do you know?</li> <li>What types of refrigerants do you know?</li> </ul> Trainer supplements knowledge gaps through PPT.
<b>20 min</b>	<b>Total time</b>			

Chapter: E2_ Environmental impact of refrigeration and related policies				
Time	Content	Objectives	Training material / demonstration equipment	Description of training sessions and trainer notes
20'	E2 Environmental impact of refrigeration and related policies	<ul style="list-style-type: none"> <li>Understand the environmental impact of various refrigerants, including ODP, GWP, CO<sub>2</sub> equivalent and TEWI</li> <li>Reflect on relevant environmental policies and restrictions: Montreal protocol and its Kigali amendment, ODS regulation and F-gas regulation</li> </ul>	E_PPT_Environmental impacts  E_TM_Environmental impacts	<u>Plenary</u>  Trainer should start the session with questions regarding participants experience to assess previous knowledge: <ul style="list-style-type: none"> <li>What types of environmental impacts are you aware of?</li> <li>What international agreements have you heard of? How do they affect your work in the RAC sector?</li> <li>Why are environmentally friendly solutions important?</li> </ul> Trainer supplements knowledge gaps through PPT.

Chapter: E2_ Environmental impact of refrigeration and related policies				
Time	Content	Objectives	Training material / demonstration equipment	Description of training sessions and trainer notes
20 min	Total time			

Chapter: E3_ Natural refrigerants - an overview				
Time	Content	Objectives	Training material / demonstration equipment	Description of training sessions and trainer notes
20'	E3 Natural refrigerants - an overview	<ul style="list-style-type: none"> <li>• Overview on natural refrigerants and their characteristics and applications</li> <li>• Get an overview on current and future green cooling technologies</li> </ul>	E_PPT_Environmental impacts  E_TM_Environmental impacts	<u>Plenary</u> Trainer should start the session with questions. <ul style="list-style-type: none"> <li>• What do you know about the difference between “chemical” and “natural” refrigerants?</li> <li>• Do you know systems/appliances working with natural refrigerants?</li> </ul> Trainer gives a short presentation.
20 min	Total time			

**Chapter: E4\_ Practical implications for technicians**

<b>Time</b>	<b>Content</b>	<b>Objectives</b>	<b>Training material / demonstration equipment</b>	<b>Description of training sessions and trainer notes</b>
30'	E4 – Practical implications for technicians	<ul style="list-style-type: none"> <li>• Importance of best practice installation, servicing and maintenance</li> <li>• Learn how to ensure the efficient working of an AC in the planning and installation stage, during operation, maintenance and servicing</li> <li>• Learn about the importance of refrigerant recovery, recycling, reclaim</li> </ul>	<p>E_PPT_Environmental impacts</p> <p>E_TM_Environmental impacts</p>	<p><u>Plenary</u> Trainer gives a short presentation.</p> <p>Discussion with participants on how they can use the information from the module in their daily work life. Discuss which changes can be implemented and what is necessary to do so, e.g. tools, further training.</p>
<b>30 min</b>	<b>Total time</b>			