Challenges in a changing environment

- The challenges that came with the unrest in Europe has created a sea of innovation and changes in the energy markets.
- At the same time, we see challenges with pollution with plastic and PFAS polluting the water all living mammals depend on.
- The ice caps are melting at an alarming rate, science has shown that the ice caps that used to keep climates stable are now melting, and the results are droughts and wildfires.
- Uninhabitable areas are spreading, and humans are moving to safe areas; creating local turbulent political climates.
- The newcomers in the safe zones need to adapt by getting trained to fit in to the new environment.
The foundation for a safe future

1. Training and education – to enable a safe and efficient future, incl. certification
2. Clear and transparent legislation – to make it easy accessible for contractors
3. Enforcement – so cowboys cannot avoid following standards and certification requirements
Education, training and certification

• To ensure the safety of products and persons that meet the systems it is of importance that the systems are properly installed and maintained

• It is important to state that the owners also have a responsibility to follow the proposals for updating that comes from the certified contractor or service technician

• The states must step up the enforcement of the qualification requirements as laid down in ISO 22712/EN 13313 but also to ensure that the design is following industry standards and guidelines
Standards and guidelines are developed

• The standards for design, installation, service and decommissioning are in places and can be a basis for developing local training

• Standards are at times complicated and that is where education and training will make the difference

• Updating staff on novelties is a management responsibility

• Owners cannot claim that they are not responsible if they do not follow recommendations given by the contractor
Learn from the accidents and near miss

• Why are near miss and minor events important?
• Safety is part of the management's responsibilities
• The lessons learn have to be recorded to avoid the future similar accidents
• 1 accident can be OK; but letting it repeat is not smart
Enforcement is unfortunately necessary

Authorities around the world in all countries are generally guilty of neglecting enforcement of rules and making the companies follow the standards and local regulations.

The industry cannot enforce the rules on their own.
Session 5

Commercial and Industrial Refrigeration

Prof. Dr. Eng. Gratiela-Maria TARLEA (1,2)
(1) TECHNICAL UNIVERSITY OF CIVIL ENGINEERING BUCHAREST
(2) THE ROMANIAN GENERAL ASSOCIATION OF REFRIGERATION
Evolution and Strategy of the Refrigerants


The European Green Deal, approved in 2020, is a set of policy initiatives by the European Commission with the overarching aim of making the European Union (EU) climate neutral in 2050.
The challenges and opportunities in adopting low GWP refrigerants:

- **Major challenges**
  - Lack of locally-demonstrated and affordable alternative refrigerants; Lack of local capacities to install alternative technologies; Lack of local training facilities for training on low GWP technologies and refrigerants; RAC service technicians are not familiar with standards that are used in R/AC/HP/RE systems and equipment; Lack of maintenance capacities and opportunities to learn the latest policies and technologies; Larger potential risks of failure and accidents; Lack of opportunities to exchange the latest development of technologies outside of the countries where the equipment is imported;
  - **Cost problems!** The technologies are not all the time available and affordable! Ex: For HC: YES for trans critical CO₂: NO.

- **Opportunities**
  - Develop research /innovation in the field of R/AC/HP/RE;
  - **Concept of Cost- Eco-Efficiency of a commercial or industrial system**;
  - Congress as a national forum where cooling technologies are shown in each country/region could be organized.
AGFR-The Romanian General Association for Refrigeration - National CERTIFICATION BODY

Do you need special training or skills to adopt the new technologies?

Following tasks:

• The elaboration of development strategies in the field of R/AC/HP/RE;
• The initiation of law projects, of regulations and standards in the field of R/AC/HP/RE;

This AGFR has succeeded to achieve the following objectives:

There were elaborated packages of concrete measures in the field of:

• Protection of the environment and management of the refrigerants;
• Certification of the professional competence of companies and specialists working in refrigeration and air conditioning, training of specialists by means of courses;
• International Projects.

Training

We organized different training levels:

Technicians- Romanian General Association for Refrigeration and PFACR; Qualification requirements ( ISO 22712/EN 13313 );

Graduated (Engineers) - RAC curricula introduced;

Post-graduated and dedicated training ;
REAL ALTERNATIVES 4 LIFE
Certified technicians in ROMANIA

The 8th National Regions

REGIUNEA 1 - Regiunea de Dezvoltare Nord-Est
Județe: Iași, Botoșani, Neamț, Suceava, Bacău, Vaslui, Suceava-Sălaj
REGIUNEA 2 - Regiunea Sud-Est
Județele: Vâlcea, Galați, Tulcea, Buzău, Constanța, Suceava Galați
REGIUNEA 3 - Regiunea Sud Măruntei
Județele: Prahova, Dâmbovița, Argeș, Sibiu, Alba, Vâlcea, Oltenia, Teleorman, Suceava Pitești
REGIUNEA 4 - Regiunea Sud-Vest Olténia
Județele: Mehedinți, Gorj, Vâlcea, Olt, Dolj, Suceava-Crișana
REGIUNEA 5 - Regiunea de Dezvoltare Vest a României
Județele: Arad, Caraș-Severin, Hunedoara și Timiș, Suceava Târgu Mureș
REGIUNEA 6 - Regiunea de Dezvoltare Nord-Vest
Județele: Bihor, Bistrița-Năsăud, Cluj, Maramureș, Satu Mare și Sălaj, Suceava Cluj
REGIUNEA 7 - Regiunea Centru
Județele: Alba, Sibiu, Mureș, Ialomița, Covasna, Brașov, Suceava Brășov
REGIUNEA 8 - Regiunea București-Ilfov, Suceava București

Thank you for your attention!
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Flammable Refrigerants & CO₂
Theoretical and Practical Training and Certification
WORKSHOP ON KIGALI IMPLEMENTATION PLANS

SESSION 5
COMMERCIAL AND
INDUSTRIAL
REFRIGERATION
PANEL DISCUSSION

Vasil Eftimov
Vienna, Austria
14 – 16.06.2023
### EXAMPLE OF ANALYSIS OF CONSUMPTION IN COMMERCIAL AND INDUSTRIAL REFRIGERATION FOR PERIOD 2020 – 2022 (from KIP PRP)

<table>
<thead>
<tr>
<th>Year</th>
<th>Sector</th>
<th>Sub-sector</th>
<th>Refrigerator and Freezers</th>
<th>Small stand-alone equipment</th>
<th>Condensing units</th>
<th>Large central pack systems</th>
<th>Total servicing need (tonnes CO2 equiv.)</th>
<th>Total Manufacturing need (tonnes CO2 equiv.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020</td>
<td>Domestic refrigeration</td>
<td>Refrigerator and Freezers</td>
<td>1.25%</td>
<td>0.28%</td>
<td>3.00%</td>
<td>6.67%</td>
<td>1.77%</td>
<td>0.67%</td>
</tr>
<tr>
<td>2021</td>
<td>Domestic refrigeration</td>
<td>Total</td>
<td>1.25%</td>
<td>9.96%</td>
<td>27.32%</td>
<td>52.51%</td>
<td>75.13%</td>
<td>44.46%</td>
</tr>
<tr>
<td>2022</td>
<td>Commercial refrigeration</td>
<td>Small stand-alone equipment</td>
<td>0.95%</td>
<td>3.50%</td>
<td>22.87%</td>
<td>62.49%</td>
<td>32.14%</td>
<td>29.54%</td>
</tr>
<tr>
<td></td>
<td>Condensing units</td>
<td>12.95%</td>
<td>11.96%</td>
<td>34.84%</td>
<td>6.15%</td>
<td>49.46%</td>
<td>10.00%</td>
<td>10.00%</td>
</tr>
<tr>
<td></td>
<td>Large central pack systems</td>
<td>37.79%</td>
<td>62.49%</td>
<td>34.84%</td>
<td>32.14%</td>
<td>29.54%</td>
<td>6.73%</td>
<td>6.04%</td>
</tr>
<tr>
<td></td>
<td>Commercial refrigeration</td>
<td>Total</td>
<td>9.96%</td>
<td>27.32%</td>
<td>52.51%</td>
<td>75.13%</td>
<td>44.46%</td>
<td>39.31%</td>
</tr>
<tr>
<td>2020</td>
<td>Transport refrigeration</td>
<td>Road transport (vans, trucks, trailers)</td>
<td>10.14%</td>
<td>8.68%</td>
<td>6.44%</td>
<td>6.44%</td>
<td>4.20%</td>
<td>6.44%</td>
</tr>
<tr>
<td>2021</td>
<td>Industrial refrigeration</td>
<td>Small / medium sized systems</td>
<td>15.37%</td>
<td>15.37%</td>
<td>16.19%</td>
<td>15.37%</td>
<td>16.19%</td>
<td>11.06%</td>
</tr>
<tr>
<td>2022</td>
<td>Industrial refrigeration</td>
<td>Total</td>
<td>2.14%</td>
<td>34.95%</td>
<td>15.37%</td>
<td>16.19%</td>
<td>49.46%</td>
<td>10.00%</td>
</tr>
<tr>
<td></td>
<td>Refrigeration Total</td>
<td>23.49%</td>
<td>62.32%</td>
<td>67.85%</td>
<td>0.00%</td>
<td>100.00%</td>
<td>100.00%</td>
<td>100.00%</td>
</tr>
</tbody>
</table>
**CHALLENGES**

- **AVAILABILITY OF ALTERNATIVES**
  Are low-GWP alternatives available in the country?

- **AVAILABILITY OF TECHNOLOGY**
  Is equipment using low-GWP available in the country?

- **QUALIFIED PERSONNEL**
  Installers and service technicians have possibilities to gain qualification on low-GWP technologies?

- **STANDARDS**
  Are safety standards and standards related to energy efficiency available?

- **MANUFACTURING FACILITIES**
  Are there equipment manufactures in the country? Local assembling companies in the country?

- **EXPERIENCE EXCHANGE**
  Are there congresses / workshops / informative materials promoting low-GWP technologies?
THANK YOU FOR YOUR ATTENTION
UNIDO - KIP workshop 2023

Marino Bassi – Nidec GA-Embraco – Key Account Sr. Advisor

June 2023
Wide application range for commercial refrigeration

FIXED SPEED
Extended cooling capacity
EL EM EH F NE NT NJ SCROLL

VARIABLE SPEED
Excellence in energy efficiency
FMX VEM VES FMF VEH VNE VNEX 3HP SCROLL

PACKAGE AND CONDENSING UNITS
Optimized design for better performance
Standard portfolio Plug n’ Cool Sliding BIOMA Hawk
Self-contained cabinets - CR
Refrigerant trends per macro-areas (Nidec - Embraco)

HCs are considered the **global solution** for commercial **self-contained cabinets** (naturally efficient)

HCs system EERs grow in a similar way
HCs – safety use

MSDSs
- Hazard statements: H220 Extremely flammable gas
- Carry out a risk assessment before the use
- Only experienced and properly instructed persons should handle it.
- Use only properly specified equipment that is suitable for this product

Safety standard requirements
- Only competent trained technicians are authorized to open circuit with flammable refrigerants

Cabinet handbooks
- Only engineers who have been trained in the safe handling and use of hydrocarbons (HCs) refrigerants should work on this system.

Technicians needs adequate training, use suitable tools/equipments and adhere to safety procedures
Africa – use of HCAs

U-3ARC - New Refrigerants - Open letter to sellers of dangerous technologies in Africa

“…. given the various international reports on climate change and the involvement of Africa in this global phenomenon, U-3ARC declares in the introduction of flammable refrigerants and technologies that use them in Africa inappropriate, until local technicians are trained. This preliminary training must be accompanied by a vast awareness campaign among users ..”

U-3ARC (Union of Associations of African Actors in Refrigeration and Air Conditioning) has been created during the General Assembly held in Ouagadougou, Burkina Faso on September 24, 2020 by 30 associations of refrigeration and air conditioning actors from 29 countries