



National Ozone Unit -Tunisia

Topic: Status of HCFCs & HFCs Management and Reduction Programs in Tunisia

Youssef HAMMAMI, National Ozone Unit Coordinator

Samedi, 23 avril 2022

Presentation plan

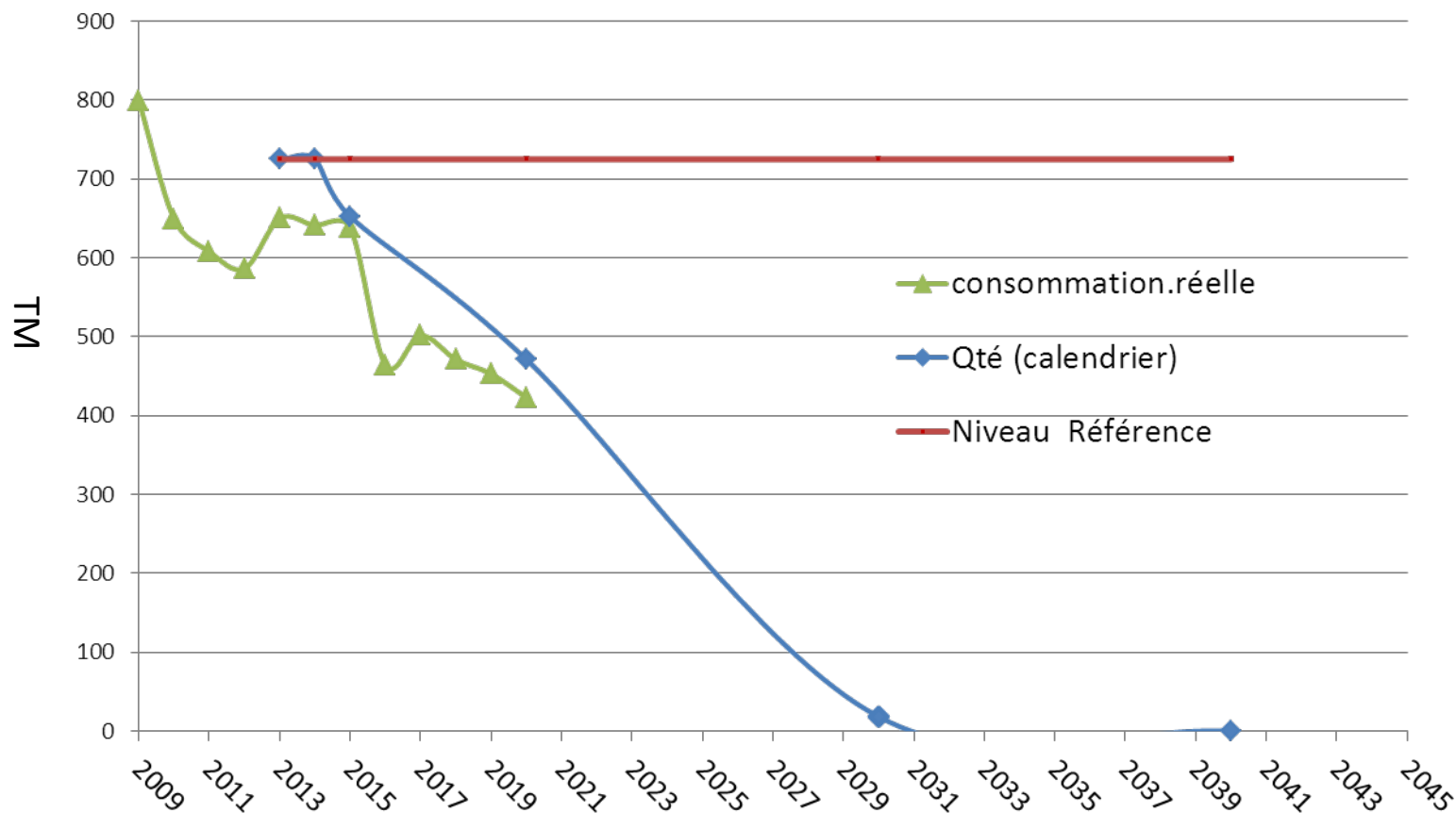
- **Achievements: Status of HCFCs/HFCs reduction programs**
- **Perspectives: Future Achievements**

Achievements: Status of HCFC phase-out programs (HPMP project)

Presentation of the HPMP project

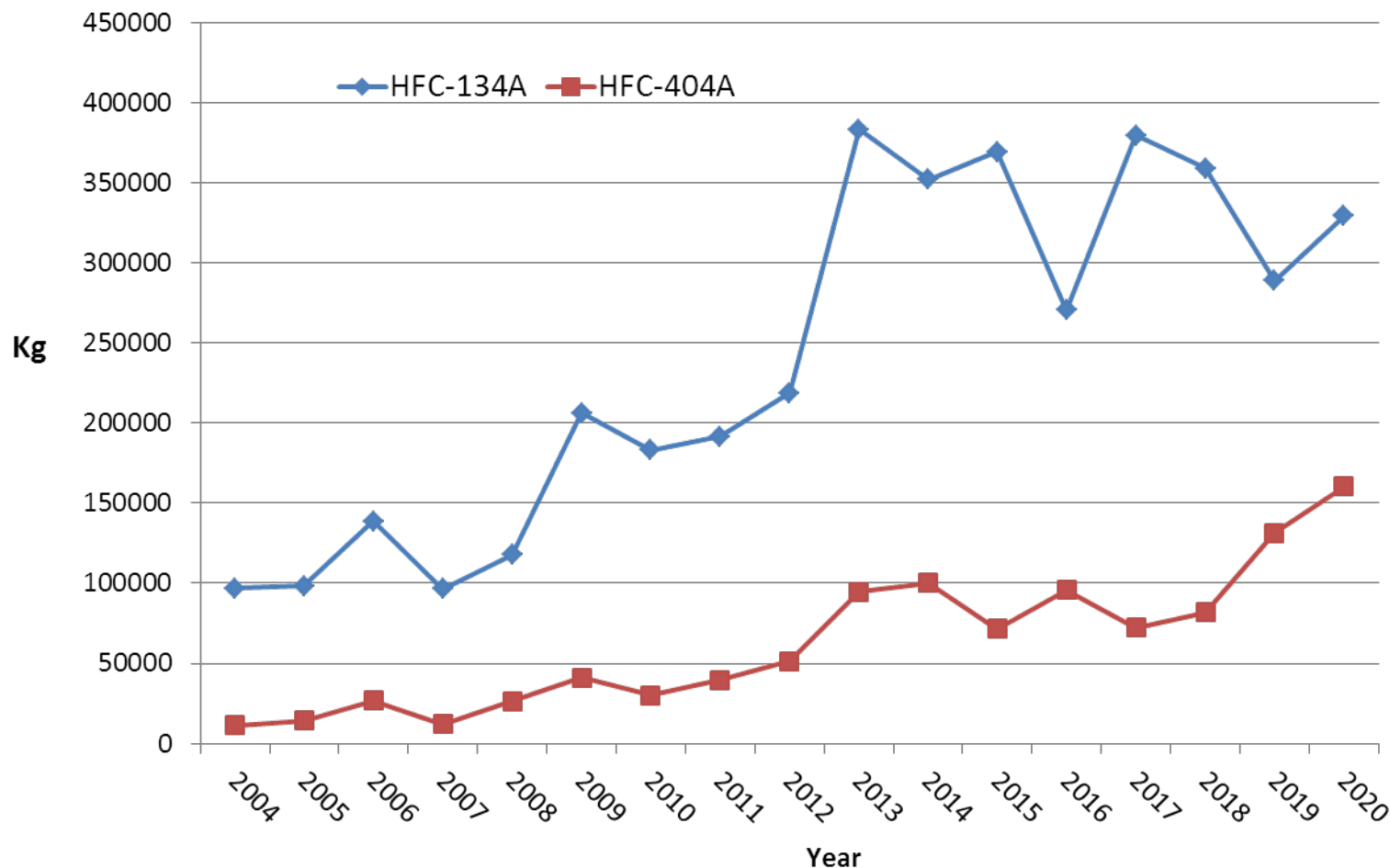
- **Objectives: Gradual elimination of HCFCs (725 MT)**
- **Project duration: 2014 – 2030**
- **Project Executing Agencies:**
 - **- UNIDO: Investment activities (conversion of industrial units, equipment, etc.),**
 - **- UNEP: Non-investment activities (capacity building and regulations...,**
- **Coordinating Agency: ANPE (National Ozone Unit),**
- **Total cost: US\$5.011 million (Grant)**

Trend of the annual evolution of the consumption of HCFCs



Consequences: Reduction of HCFCs by 41.68% (2020)

Trend of the annual evolution of the consumption of HFC-134a and HFC-404A



HFC-410A: 150,361 kg (2019 statistics)

HFC-410A: 273,421 kg (2020 statistics)

Consumption increase: 81.84%

**Establishment of a National System
Certification of Technicians and Service Companies
operating in the Refrigeration & Air Conditioning Sector
(RAC)**

- **Main Achievements/Certification:**
- **Certification of 65 trainers operating in the refrigeration and air conditioning sector (RAC) from 6 ATFP training centers,**
- **Equipment of 6 ATFP training centers with didactic training systems & tools,**
- **Development of certification training modules,**
- **Development of a module on natural and flammable refrigerants,**
- **Preparation of a regulatory framework for certification (decree being finalized).**

- **Nombre total des formateurs certifiés: 65**

Centre	Number of certified trainers
CFSBA-Ibn Sina	09
CFSE-Djerba	11
CSFM-Nabeul	13
CSFMH-Tabarka	11
CSFE-Kairouan	14
CFA – Bach Hamba Sfax	7
Total	65 Certified RAC trainers

- **Training office: Centro Studi Galileo,**
- **Certification body: Veritas (Italy), certification according to European regulation 303/2008,**
- **Category of certification: cat I,**
- **Certification validity: 10 years.**

Geographical location of training centers

TUNISIE



Certification of refrigeration trainers: Practical session



Establishment of a certification system for refrigeration trainers

- Certification of 65 trainers (6 ATFP training centers) according to European regulations: (EC 517/2014, EC 842/2006)



Clôture d'une session de certification

TRAINING OF TRAINERS ON CERTIFICATION MODULES

- **Training modules: Prepared in April – October 2018,**
- **Organization of the two training sessions: 1 session in April 2019 and 1 session in June 2019**
- **Beneficiaries: certified trainers (65)**
- **Number of centres: 6 (Tunis, Nabeul, Kairouan, Sfax, Djerba and Tabarka)**



Programme National de Certification dans le Secteur de la Réfrigération et de la Climatisation

MANUEL DE FORMATION DE CERTIFICATION



Manuel sur les bonnes pratiques de service
en réfrigération et en climatisation

Photos: progress of the training sessions (theoretical & practical)



TRAINING ON NATURAL REFRIGERANTS (2019)

Training topics:

The use of natural refrigerants such as hydrocarbons R600a and R290, carbon dioxide CO₂ (R744) and ammonia NH₃ (R717), their current and future applications.

Safe handling and maintenance measures for natural refrigerants.

Safety standards and risk assessment related to natural refrigerants.

International laws and standards that regulate the use of refrigerants.

- **Number of sessions: 2 sessions (February & April 2019)**
- **Organized by Support: GLZ**
- **Number of beneficiary trainers: 51**
- **Number of centres: 6 (Tunis, Nabeul, Kairouan, Sfax, Djerba and Tabarka)**

Photos of training sessions on natural refrigerants (theoretical sessions)





**FLUIDES FRIGORIGÈNES
NATURELS ET INFLAMMABLES**

MANUEL DE FORMATION

**Manuel sur les bonnes pratiques de service
en réfrigération et climatisation**

Training Program for Service Technicians operating in the Refrigeration & Air Conditioning Sector (RAC)

National achievements in 2021

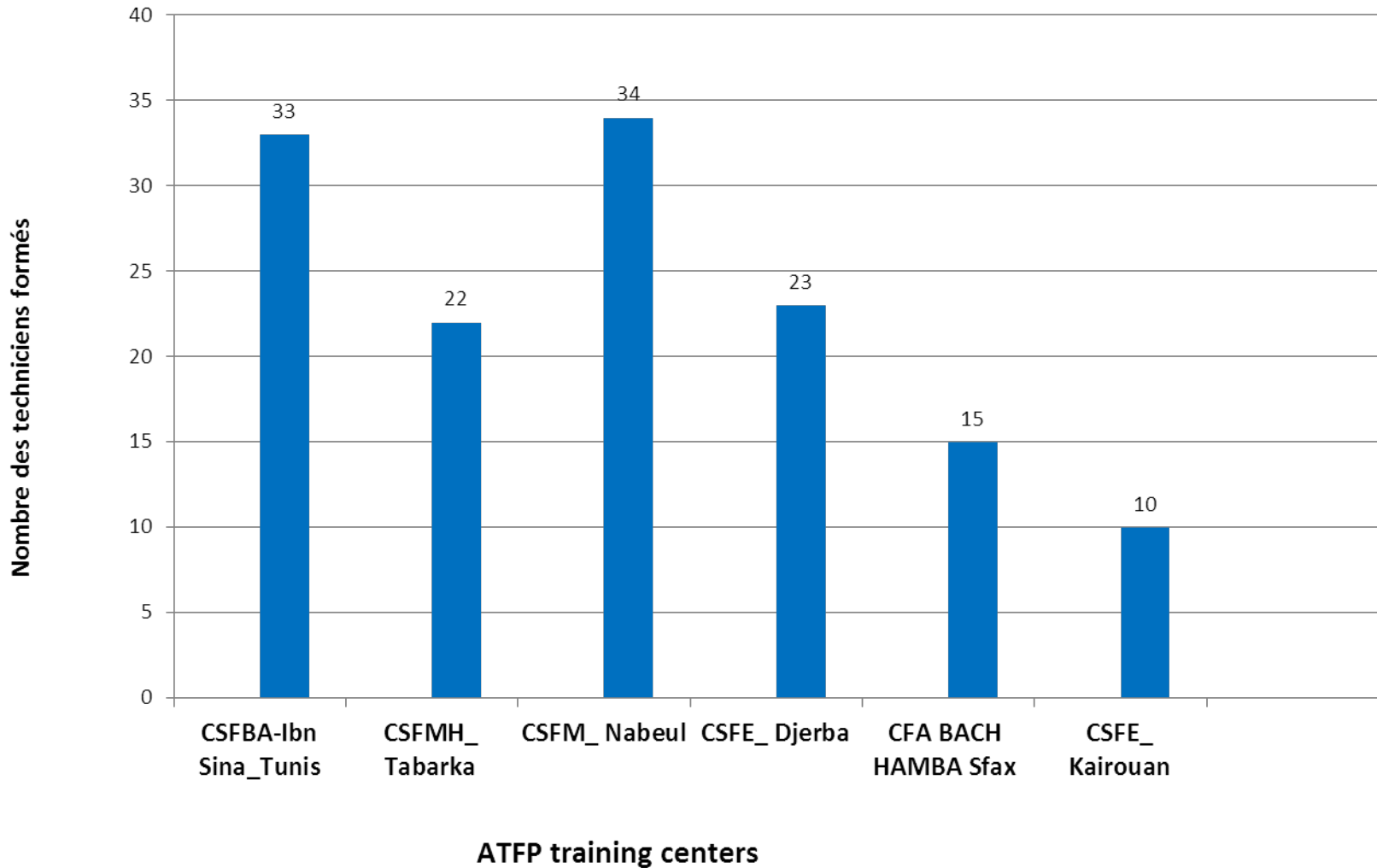
Strengthening the technical capacities of technicians operating in the RAC sector.

6 cooperation agreements between the ANPE and professional training centers specializing in the refrigeration sector under the ATFP.

18 training sessions carried out in 2021.

137 RAC technicians trained in 2021.

Breakdown of RAC technicians trained in 2021 by training center



National Achievements in 2022 - Continued

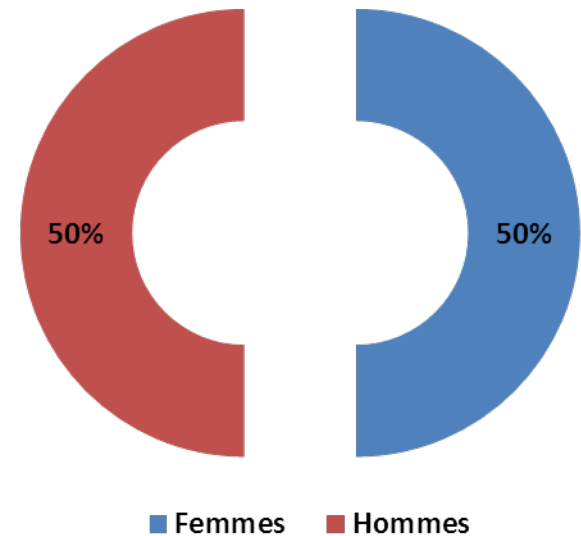
Strengthening the technical capacities of technicians operating in the RAC sector.

03 training sessions carried out in 2022.

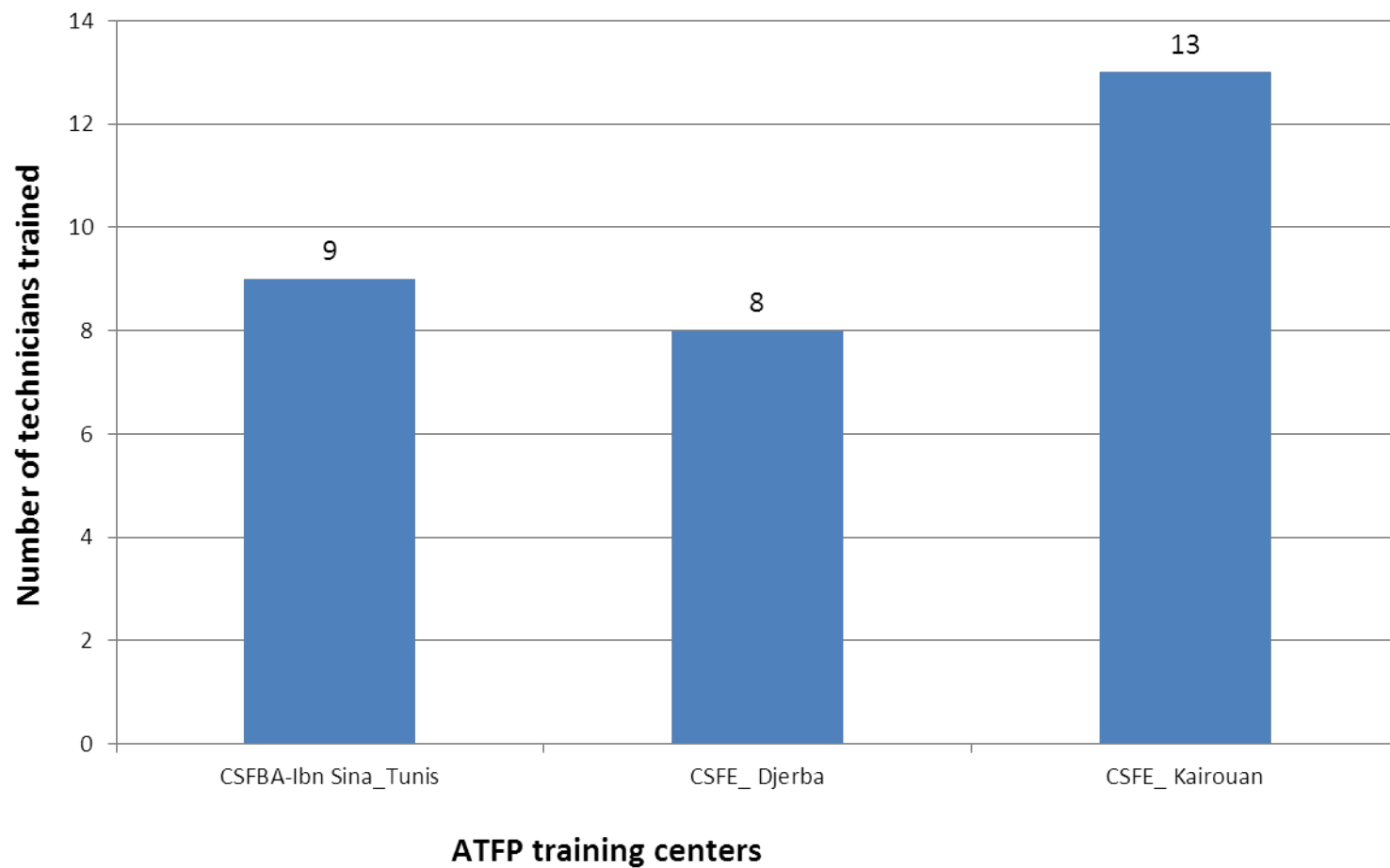
30 RAC technicians trained in 2022.

Breakdown by gender of technicians trained in 2022 by:

Breakdown of trained technicians by gender (2022)



Breakdown of technicians trained in 2022 by training center



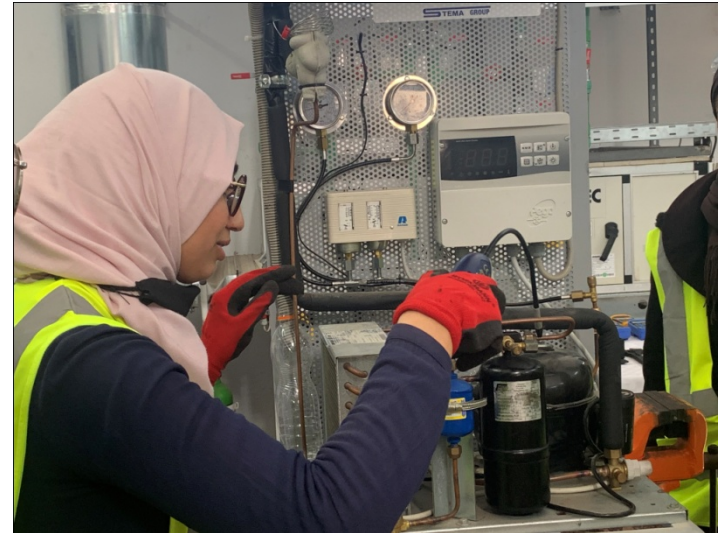
Conduct of RAC technician training sessions (2021)



Conduct of RAC technician training sessions (2022)



Brazing under nitrogen flow



Electronic leak detection



Recovery of fluorinated refrigerants (FFF)

Strengthening the crucial role of NGOs: ATRC



Distribution of refrigerant identifiers to the ATRC



Distribution of the certificate
"Cold champion in Tunisia"
- 2021-
ATRC



Participants of the JMR (WRD) 2021

Training & awareness program

**On the challenges of reducing HFCs in the Refrigeration
& Air Conditioning Sector (RAC)**

ORGANIZATION OF TRAINING AND AWARENESS DAYS ON THE REDUCTION OF HFCs IN THE RAC SECTOR

- Number of workshops: 4 (Jendouba, Gabès, Sousse & ISST Bordj Cedria)
- Organization: Jointly with ATRC
- Objective: Raising awareness on the Kigali Amendment



Jendouba



Gabès



Sousse



ISST Bordj Cedria

**Program for the establishment of a National System for the
Recovery, Recycling & Regeneration (3R) of Fluorinated
Refrigerants (FFF: HFCs /HCFCs)**

Development of a technical and economic model (Business model) with a view to establishing a sector for the Recovery, Recycling and Regeneration (3R) of Fluorinated Refrigerants (FFF).

- Preparation of the ToR (March - April 2021),**
- Recruitment of national experts (May 2021),**

A refrigeration expert,

An expert in environmental law,

- Presentation of the first version of the model and the draft decree: June 26, 2021**
- Presentation of the second version: September 16, 2021**
- Presentation of the third version: October 13, 2021 (workshop in Sfax)**

Presentation of the first version of the technical-economic model



**Photos: Workshop in Sfax
October 13, 2021**



**Training and Technical Capacity Building Activities for
Customs Officers
(Training of Trainers)**

The National Ozone Unit (ANPE) organized in collaboration with the DRF – Customs several training sessions for Tunisian customs officers

Year	Place of training	Number of participants
2016	Tunis, Zarzis, Gafsa	66
2018	Tunis, Zarzis, Sfax, Sousse	122
2019	Tunis	21 (session n°1: training of trainers)
2021	Tunis	13 (session n°2: training of trainers)

National achievements in 2021 (session n°2: training of trainers)

Strengthening the technical capacities of Customs Trainers

Training of Customs Trainers

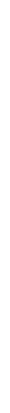
One (01) training session for Trainers in 2021

Session duration: 4 days (May 2021)

Course of the session: Theoretical/Practical/Pedagogical

13 trainers trained

Training sessions for Customs Trainers (May 2021 session: 4 days)





COURSE OF THE THEORETICAL SESSIONS (MAY 2021)



Course of the practical sessions (May 2021)

KIGALI AMENDMENT TO THE MONTREAL PROTOCOL

Ratification of the Kigali Amendment

Tunisia ratified the Kigali Amendment in 2021:

Organic Law No. 2021-11 of March 24, 2021 approving the accession of the Republic of Tunisia to the Kigali Amendment (AK);

Government Decree No. 2021-26 of March 24, 2021;

Instrument of ratification deposited at the UN: August 27, 2021;

Tunisia is the 124th country to ratify the AK;

Félicitations de Mme La Secrétaire Exécutive du PNUE

(10 septembre 2021)



Inger Andersen ✓
@andersen_inger

Bravo to Tunisia 🇹🇳 for ratifying the Kigali Amendment to the Montreal Protocol, becoming the 124th party. The Kigali Amendment targets the phase down of hydrofluorocarbons (HFCs), potent greenhouse gases. In a [#ClimateCrisis](#), important that countries step up [#ClimateAction](#)



Tunisie 124ème partie à ratifier
l'amendement de Kigali

Perspectives: Réalisations futurs

Development of a national strategy for the reduction of HFCs

- Project approved in November 2021 (88th meeting of the MLF Executive Committee)
- Amount: US\$190,000 (Grant from MLF)
- Implementation timeframe: 2022-2023
- Project start date: February 2022
- March 29, 2022: Organization of a round table
- April 2022: Start of the preparation of studies

Areas of reflection for the future HFC reduction strategy

- Policy measures,
- Training and skills development of RAC actors,
- Development of an awareness program
- Conversion of industrial units,
- Retrofit of refrigeration installations,
- Energy efficiency in the RAC sector,
- Extend the certification system for natural FFs,
- Promoting the Recovery, Recycling and Regeneration of FFFs

Project "Tunisian Green Cooling Program"

- **Project funded by: K-CEP (Nov 2021)Climate Works Foundation**
- **Framework: CDN – Paris Agreement**
- **Support Tunisia in the implementation of NDCs in the RAC sector**
- **Goal:**
 - **- Reduction of HFCs in the RAC sector,**
 - **- Promote the use of natural refrigerants,**
 - **-Energy efficiency in the tertiary AC sector**
- **Energy efficiency in the building sector**

Start of the "Tunisian Green Cooling Program" project

March 21, 2022



Incentive program for low-GWP refrigerants (natural refrigerants)

- **Program included in phase I of the HPMP**
- **Co-financed by AFD**
- **Goal**
 - **Activity aimed at owners of refrigeration equipment to reduce energy consumption by updating old installations that are leaking and inefficient.**
- **Proposed approach**
- **To raise awareness of the use of low GWP (Global Warming Potential) refrigerants in industry and small businesses through the presentation of a case study (new equipment operating with low GWP refrigerants).**
- **Preparation of a case study brochure (leaflet) and presentation of the results in a workshop (world refrigeration day: June 26, 2022).**



Gelatino fridge running on R290 (150 g)

Monitoring of the operating parameters of the 2 equipment:

- Energy consumption,
- Internal and external temperature,
- Pressures



Gelatino fridge running on R404A (600 g)

thank you for your attention

Youssef HAMMAMI

Coordinator of the National Ozone Unit/ANPE

Email: youssefhamami@yahoo.fr

Follow us on the facebook page:



: National Ozone Unit-Tunisia

