



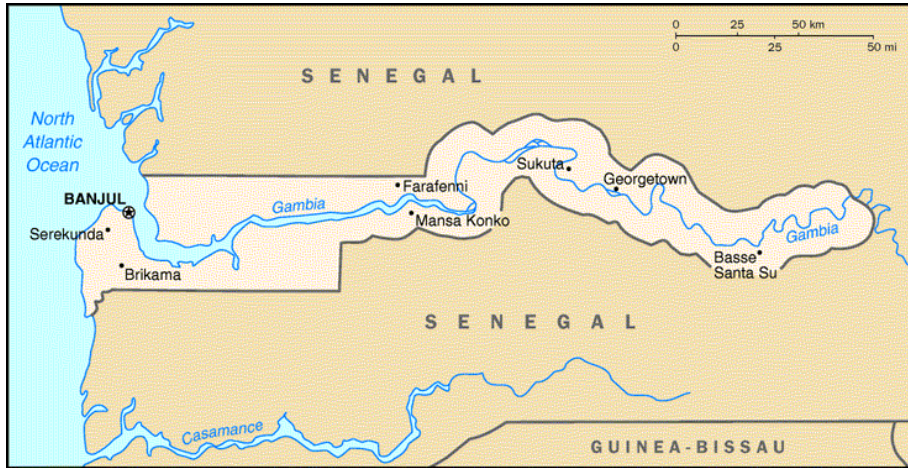
**APPLICATION OF NATURAL  
REFRIGERANTS:  
GAMBIA'S SITUATION AND EXPERIENCE**

**Chillventa, October 2018**

# PRESENTATION OUTLINE

- COUNTRY BACKGROUND
- PROJECT SUMMARY
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- PROJECT IMPACT AND KEY FEATURES
- LESSONS LEARNT
- CURRENT SITUATION AND MARKET TREND
- CHALLENGES AND WAY FORWARD

# COUNTRY BACKGROUND



- The Gambia (**The Smiling Coast of Africa**) in West Africa occupies an area of 11,365 sq km
- It has an estimated population of 1.9 million with an annual growth rate of 3.1%; (GBOS 2013)
- Ratified Vienna Convention in May 1990 and the Montreal Protocol in June 1990, while the Kigali Amendment is in progress for ratification
- It is categorized as a Low-Volume-ODS Country, and, it has been almost exclusively HCFC-22.
- However, the Gambian market started to offer new energy efficient Air-conditions marketed as reducing 70% of energy consumption, but the use of HFC 407c and 410a was getting high
- **As a result the Government of The Gambia initiated a pilot project to adopt and use alternative low-ODS, low GWP with interim focus to establishing and testing the mechanisms for technology transfer**

# Project summary

- Is a medium size project funded by GEF with co-financing from the government of the Gambia through:  
[GEF 5 Focal Area Strategy for climate change mitigation, “to support developing countries and economies in transition toward a low-carbon development path”, namely with **objective 2** “Promote market transformation for energy efficiency in industry and the building sector”]
- It was anchored on the following pillars:
  1. Reduction of GHG & ODS Emission
  2. Promotion of energy efficiency

(i.e. reducing GHG emissions associated with industrial refrigeration facilities in the Gambia by removing barriers to increased energy efficiency and establishing the enabling environment for the introduction of low global warming potential (GWP) alternatives to HCFC-22)
- It is estimated that direct gas emission reductions totaling 56,000tonnes of CO<sub>2</sub>e will be achieved over the lifetime of the investment of 10yrs (2014-2024)

**NB: It is worth mentioning that this project has been designed and implemented prior to the Kigali Agreement**

# PROJECT COMPONENT AND OUTCOMES

## Policy

- Policy, legal and regulatory measures are adopted by government to support the adoption of low global warming potential and energy efficiency technology

## Technology transfer

- **Technical and financial support on improving systems, and reducing greenhouse gas emissions and operational costs is ensured**

## Awareness raising

- Demand is increased for refrigerant systems with low global warming potential that are more energy efficient than existing technology

# PROJECT IMPACT AND KEY FEATURES OF THE SUPPORT SERVICE

- Establishment and operation of a technical support mechanism (**Gambia Refrigeration and Air-conditioning Support Service**)
- Trained **20 SUPER TECHNICIANS (Lead trainers)** in collaboration with CENTRO STUDI GALILEO of ITALY; that in turn trained over 200 technician country wide
- Installation of a CO2 Cascade system and R-290 Split Air-conditioners at GTTI (training institution) as demo
- The intensified training and awareness raising programmes was key to removing barriers to increased energy efficiency and establishing the enabling environment for the **introduction of low global warming potential (GWP) alternatives to HCFC-22**
- However, the behavioural changes initiated with this project would require continued action to consolidate and expand

Targeted directly at supporting industry

Made use of existing refrigeration and air-conditioning service providers working in the market that become advocates of energy efficiency and promoters of new refrigeration options

Ensured that individualized technical assistance and financing support options are available to transform knowledge into real improvements

# PICTURE: TRAINING OF SUPER TECHNICIANS



CAPACITY BUILDING & INNOVATIVE PARTNERSHIP ARE KEY TO BREAKING BARRIERS TO THE INTRODUCTION OF NATURAL REFRIGERANTS

# LESSON LEARNT

➤ **The incentives to promote behavioural change was derived from three main conditions:**

- i) the adoption of policy, legal, and regulatory measures (such as a quota on imports of HCFC equipment and tax incentives to the purchase of alternative refrigerants and equipment);
- ii) the conscience of the added values (environmental, social and financial) of using low GWP and high-energy efficient equipment, and of decreasing gas leakages; and
- iii) the existence of financial incentives to attract the change

➤ **The capacities to bring about change required:**

- i) adaptation and demonstration of technologies and approaches to serve as models, enable learning and to prove the value of the alternative; and
- ii) the end-users knowledge on how to safely use flammable gas equipment so as to avoid accidents and a negative image of the technology.



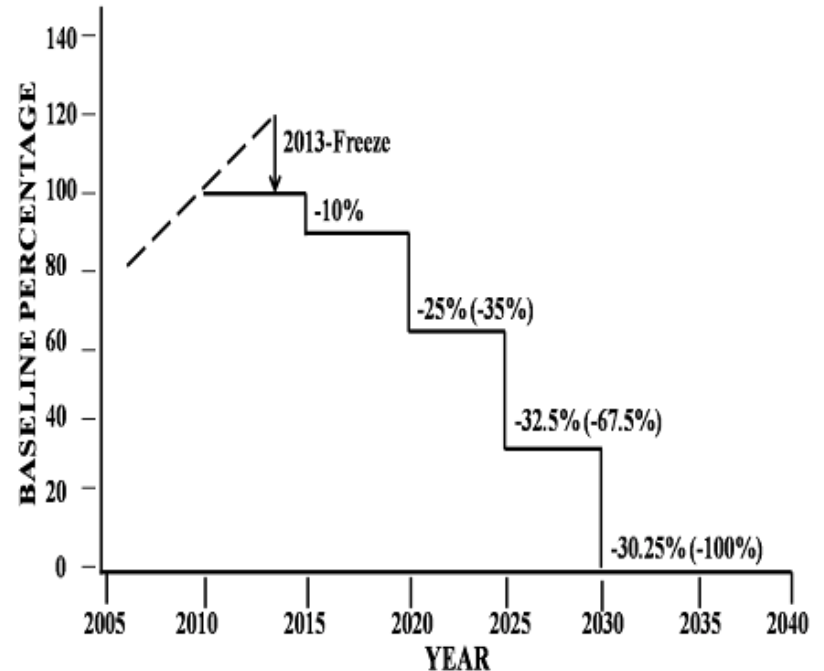
# CURRENT SITUATION AND MARKET TREND

<b>DOMESTIC</b>	The domestic refrigeration sub-sector is dominated by R-134a and R- 600a and this stems from the fact that most of the cars, home refrigerators, freezers and water coolers that are imported in the country are already charged with R-134a and R-600a
<b>COMMERCIAL</b>	<ul style="list-style-type: none"> <li>➤ This sector uses a number of ODS alternative refrigerants namely R-407c, R-404c, R-410A, and R-134a.</li> <li>➤ R-134A is used in automotive refrigeration and air-conditioning. R-407c is used mostly in central air conditioning systems whilst R410a is used in floor standing units and split systems</li> </ul>
<b>INDUSTRIAL</b>	<ul style="list-style-type: none"> <li>➤ R-22 is the predominant refrigerant used in industrial refrigeration. It is still used in some fish processing and ice plants as well.</li> <li>➤ Ammonia is commonly used in the breweries industries</li> </ul>
<b>TRANSPORT</b>	R-134a and HFO1234yf are the refrigerants used in automotive refrigerators and air-conditioning. However, the HFO1234yf series are supposed to replace R-134A are still not yet in the country
<b>STATIONARY CONDITIONING</b>	<b>AIR</b> HCFC 22 are mainly used in Domestic Air Conditioners and cold rooms of fishing Industry, while HCFC-141b and HCFC142b are mainly used in commercial refrigeration systems

SOURCE: [National Ozone Office, Alternatives Survey Report, 2016]

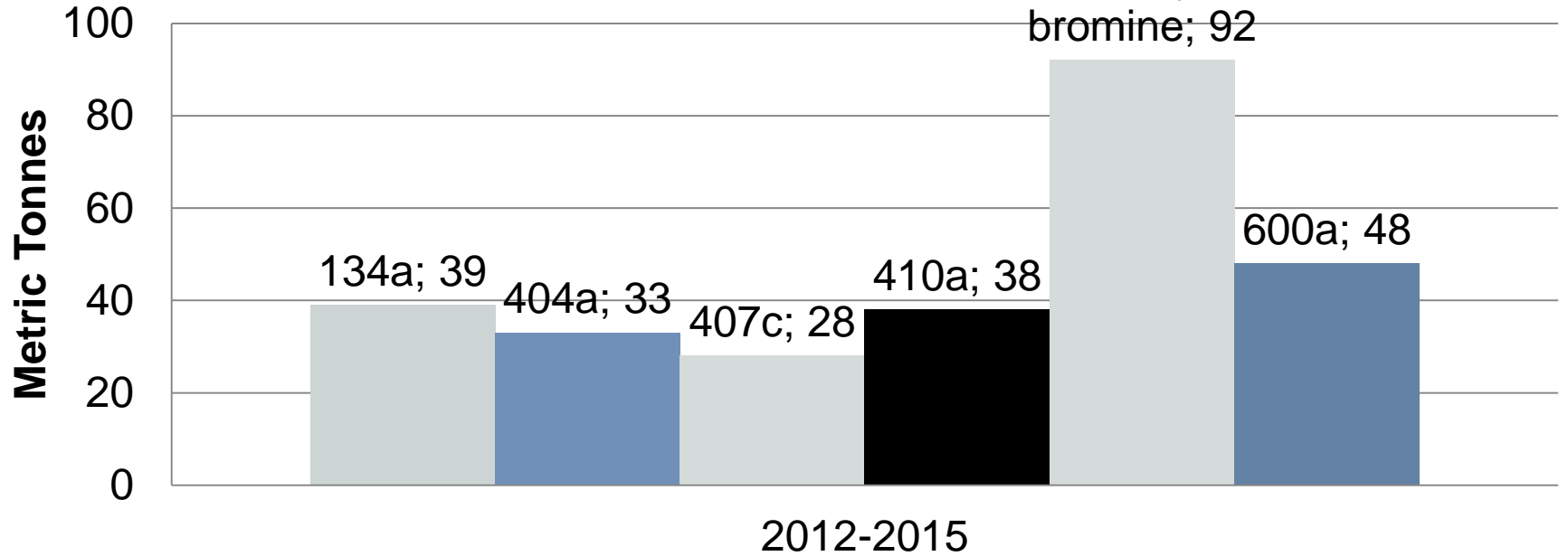
# CURRENT SITUATION AND MARKET TREND

- We are now faced with a unique opportunity to effectively connect the fast adoption of sustainable low/zero GWP solutions with economic growth, regulatory stability and positive societal change
- Gradually Moving towards the realization of the percentage reduction for the HCFC Phase-out TARGET for 2040
- The ODS Survey results have shown that the HC refrigerants are gradually increasing in the domestic and commercial refrigeration sectors and the market penetration is expected to continue upward. However, safety concerns are slowing the uptake of this technology



# EXAMPLE : the alternatives survey report 2016 indicated that:

Summary of use in all sectors 2012-2015



# CHALLENGES AND THE WAY FORWARD

- CHALLENGES

The challenges are not that much different faced by other developing countries such as:

1. Limited supply/availability of HCFC alternatives (e.g. R290)
2. Limited supply of refrigerant analyzers
3. Illegal trade (porous border)
4. Conversion of systems to HCFC alternatives
5. Mobility constraint for monitoring
6. Inadequate funding to carry out the required trainings
7. Implementation of the certification scheme

**Just to mention a few...**

- WAY FORWARD

- Awareness and capacity building of technicians on emerging and available alternate refrigerant based technologies
- Create incentives to attract end-users towards natural refrigerants
- Organize trainings workshops for stakeholders in RAC sector on Natural refrigerants
- Create networks with manufacturers of Natural refrigerants to Pilot their products in The Gambia
- Organize a Sub-regional Workshop on Natural Refrigerants in The Gambia to share best practices
- Strengthen partnership with implementing agencies and organizations
- Strengthen quota system and develop safety standards
- Regional & cross-border collaboration

# PROJECT PARTNERS & ACKNOWLEDGEMENT



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FOR THE INVITATION AND THIS  
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PARTNERSHIP

**DISTINGUISHED PARTICIPANTS:**  
THANK YOU FOR YOUR KIND  
ATTENTION AND  
FOR GRACING THIS EVENT

Email: [bafodays@yahoo.com](mailto:bafodays@yahoo.com)

Phone: 002209800371

Watsup: 002202065517

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refrigerants delivered by mother nature

**eurammon is always available as a sparring partner for questions on refrigeration with natural refrigerants.**

Contact:

Dr. Karin Jahn

Lyoner Straße 18

60528 Frankfurt

Germany

Phone: +49 (0)69 6603-1277

E-Mail: [karin.jahn@eurammon.com](mailto:karin.jahn@eurammon.com)

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