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# CHILLVENTA eSPECIAL

Refrigeration | AC & Ventilation | Heat Pumps

13.–15.10.2020

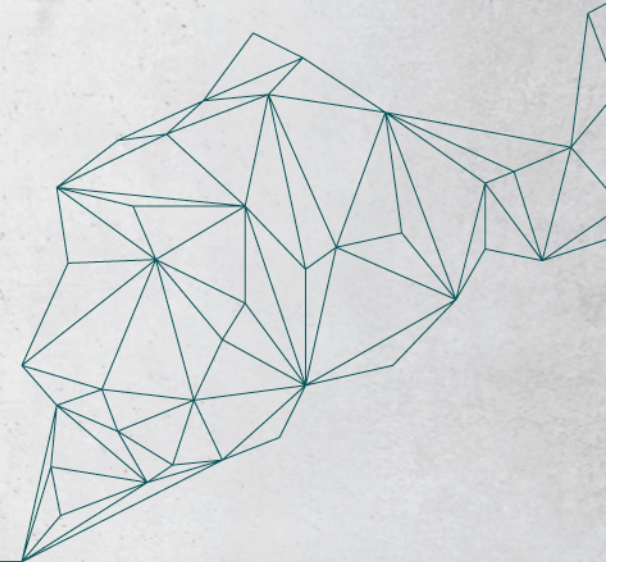
NÜRNBERG MESSE



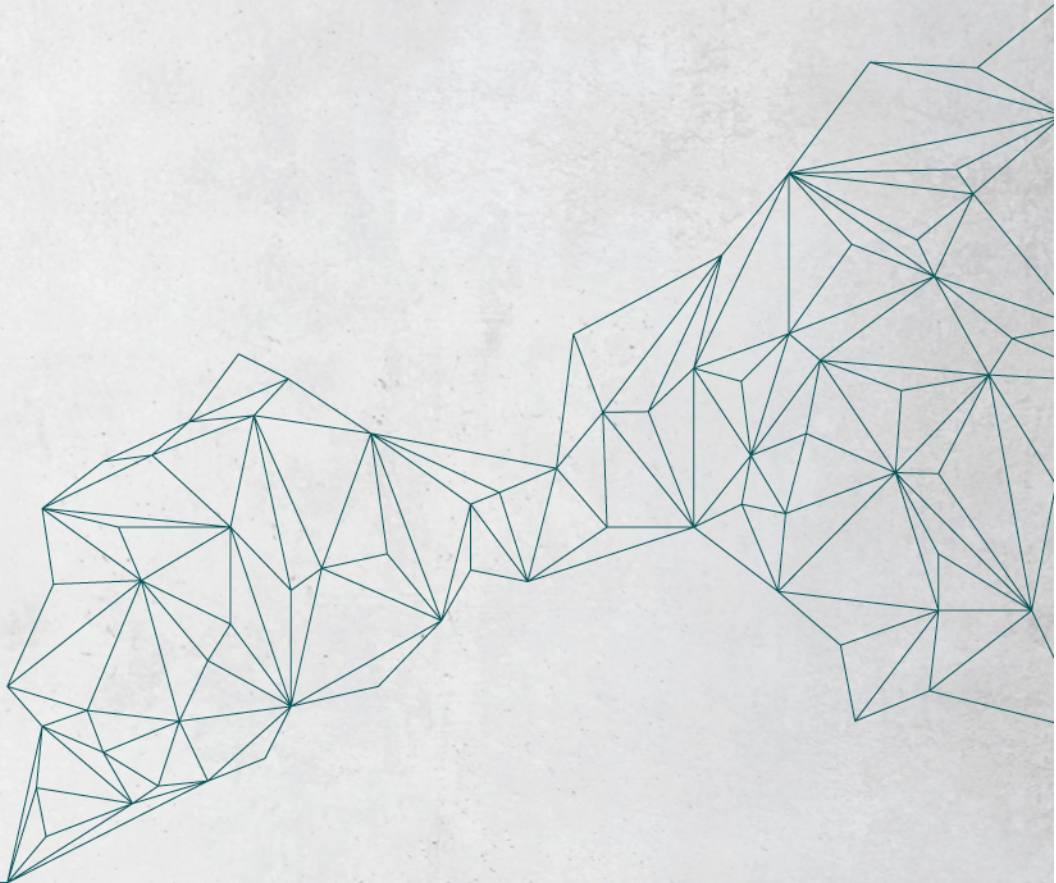
Moving towards natural refrigerants in a South African context.



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# Status Quo, National Government, Regulations

## Kigali Amendment

South Africa ratified the Kigali amendment late 2019

Under the Kigali amendment, countries committed to cut the production and consumption of HFC's by more than 80 percent over the next 30 years

The phase down program and processes are yet to be promulgated

## South African National Standards (SANS) with respect to natural refrigerants

South Africa has national quality standards in place

The Standards adequately cover Ammonia

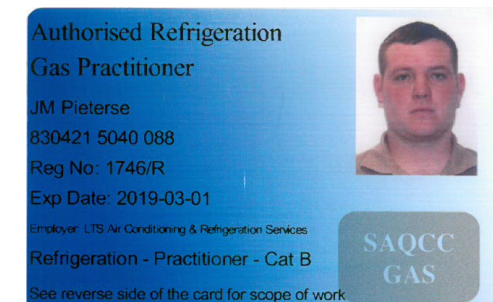
Refrigerants: Hydro Carbons (HC's), Hydrofluoroolefin's (HFO's) and Carbon Dioxide are not currently covered by SANS

## Pressure vessel Regulation, in force from 1 October 2009, (OHS act No: 85 of 1993) Section 44 Rev 2 of 2017.

Mandatory training for all personals working with refrigerants in including all natural refrigerants

The issue of a certificate of conformance for all equipment

utilising any refrigerant with operating pressures above 50kPa





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## Overview of sectors within industry

### Domestic Refrigeration Sector:

- Use of Hydro Carbon refrigerants in new equipment (R600a) fully implemented
- Repairs / Maintenance being conducted. (Formal and informal markets)

### Parts / consumables

- Not always freely available (R600a)

### Training and Certification

- Training and Certification is available for this sector including Hydro carbon refrigerants

### Challenges

- Resistance to change
- Lack of national technical standards and enforcement
- Lack of knowledge / skills
- Technicians **reverting** equipment back to R134a

# Overview of sectors within industry

## Commercial and Transport Refrigeration Sector:

- R22, R134a, R404a in common use, since late 2015 no new R22 installations, phase down process has begun for R134a / R404a R290 introduced into beverage display refrigeration systems
- Success story: R290 light commercial refrigeration units introduced into the South African market in excess of 20 400 for 2019

## Parts / consumables

- Not freely available (R290)

## Training and Certification

- Training and Certification is available for this sector including Hydro carbon refrigerants

## Challenges

- Resistance to change
- Lack of knowledge / skills
- Lack of national technical standards and enforcement
- Lack of replacement parts and consumables resulting in systems being retrofitted back to R134a



## Overview of sectors within industry

### Industrial Refrigeration Sector:

Use of Ammonia, well established

R22, R134a and R404 remain in older installations

Use of carbon dioxide, Two of the larger food retail outlets are reporting installations in excess of 100 and 38 transcritical systems respectively in larger outlets

Third retailer looking into transcritical systems

### Parts / consumables

- Available, systems are locally designed and manufactured

### Training and Certification

- Training and Certification is available for some of this sector. South Africa has a newly developed curriculum that includes all refrigerants including Ammonia and Carbon Dioxide. Full Ammonia and Carbon Dioxide certification for technicians under development

### Challenges

- Companies within Industry are ring fencing Carbon Dioxide technologies, slowing down growth
- Lack of national standards and enforcement for Carbon Dioxide



# Overview of sectors within industry

## Unitary air conditioning

- R22 in common use, R410a common in new installations. R32 in use
- No R290 air conditioning systems installed, no imports of R290 unitary air conditioning systems to date
- Potential for natural refrigerants (R290) very high. Unitary systems constitute a large portion of the air conditioning and refrigeration sector in South Africa

## Parts / consumables

- Not available (R290)

## Training and Certification

- Training and Certification is available for this sector including Hydro carbon refrigerants

## Challenges

- Considerable resistance to change
- Lack of knowledge / skills
- Lack of national standards and enforcement
- Reported challenges around the importing of R290 systems. (Customs)
- Manufacturers feel that “South Africa not ready” for R290 systems. Suppliers not importing R290 systems

# Overview of sectors within industry

## Industrial Air conditioning systems, central plants

R22, R134a, R404a in common use

No R290 systems. Potential for natural refrigerants (R290) good

## Parts / consumables

- Not freely available (R290)

## Training and Certification

- Training and Certification is available for some of this sector. South Africa has a newly developed curriculum that includes all refrigerants including natural refrigerants

## Challenges

- Resistance to change.
- Lack of national standards
- Lack of knowledge / skills
- Reported challenges around the importing of R290 systems. (Customs)
- Manufacturers feel that “South Africa not ready” for R290 systems.



200kW Indirect R290 Chiller (Germany)  
Total refrigerant utilised: 14 Kg's R290

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# New Curriculum's

The South African National Curriculum was revised and registered in 2019.

The new curriculum has two main qualifications:

1. Air conditioning (New) 4 year

Includes all Refrigerants

2. Refrigeration 3 - 4 Year

a. F Gasses, HC's and HFO's

b. Ammonia

c. Carbon Dioxide

Both of the new curriculum's completely embraces the use of Natural Refrigerants

The minimum working entry requirements for the industry is the safe handling licence, which falls in line with the national qualifications



2019 group completed training  
including Hydro Carbons, R600a and R290a

# Natural refrigerant training availability

## Ammonia

- Well established in industry (workplaces) but under development at training providers and assessment centres
- Ammonia trade testing under development

## Carbon Dioxide

Well established in industry (workplace providers) but under development at training providers and assessment centres

Carbon dioxide trade testing under development

## Hydro Carbons and HFO's (A2 and A2L Refrigerants)

The base technology is known to our technicians, we only need to deal with the flammability aspect

We are up to date with Hydro carbon training methodologies

The safe handling courses have been revised to include hydrocarbons

The safe handling training and registration is in process to become standardised under the banner of the Quality Council for Trades and Occupations. (Nationally regulated)

## Natural Refrigerant training Projects

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## Western Cape Government (\*Lead Department)

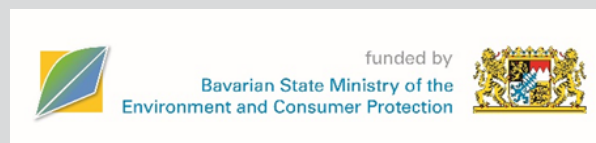
Department of Environmental Affairs and Development Planning\*

Department of Economic Development and Tourism

## Bavarian State Ministry of the Environment and Consumer Protection

## Bavarian Environment Agency (Unit 76, analysis of chemicals and substances)

## GIZ GmbH (Proklima) | Green Cooling Initiative



# RAC Partnership Project

## Aims:

To fast track the implementation and the utilisation of natural refrigerants in South Africa

To develop a natural refrigerant training program.

To develop the envisaged training material and associated assessments

To assist the nominated training provider with regards to the practical training aspects

To assist the provider in the selection of learners

To assist the nominated training provider to offer the program inclusive of the practical aspects

To expand the program as a national initiative



## Status Quo

- The safe handling curriculum, training material, practical tasks, assessment tools and all provider documentation needs to be a nationally registered training program.
- Persons in the informal sector require some training to assist breaking into the formal sector.
- Persons who are working in the informal and formal sectors are often doing so illegally contravening the OHS Acts Pressure Vessel Regulations due to non compliance.
- The considerable resistance to change. (High pressures, flammability)
- Persons from the informal and formal sectors working on natural domestic systems often revert the systems back to HFC 134a.
- The quality of workmanship often being poor due to non trained personnel attending to installations / repairs.

## Outcomes

The informal sector will undergo training, assessment and achieve recognition on the D.E.F.F and Unido project inclusive of hydro carbons. The program, including the curriculum, training material tasks and assessments become the property of the Quality Council for Trades and Occupations for use by all accredited training providers. This program therefore sets the standard for the safe handling training nationally and will act as the catalyst for implementing training around natural refrigerants across all sectors within industry.



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## Challenges with regards to natural refrigerants

- Regulatory requirements not in place, phase down process not yet promulgated, industry unsure of how to proceed
- Lack of scope within national technical standards (SANS)
- Lack of industry buy in
- Lack of enforcement (D.O.L.)
- Manufactures not supplying equipment utilising natural refrigerants into the market
- Supply chain not in place for natural refrigerants / equipment / accessories / parts
- Reported difficulties in importing equipment utilising natural refrigerants
- Fear, lack of knowledge and resistance to change
- Lack of assessment / trade test facilities for Ammonia / Carbon Dioxide

Thank you for your attention.

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