

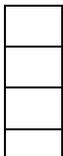
SAIRAC

The South African Institute of Refrigeration and Air Conditioning
www.sairac.co.za



President's report

Ending 30 June 2019



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1 Introduction

Greetings to all our members and industry relations.

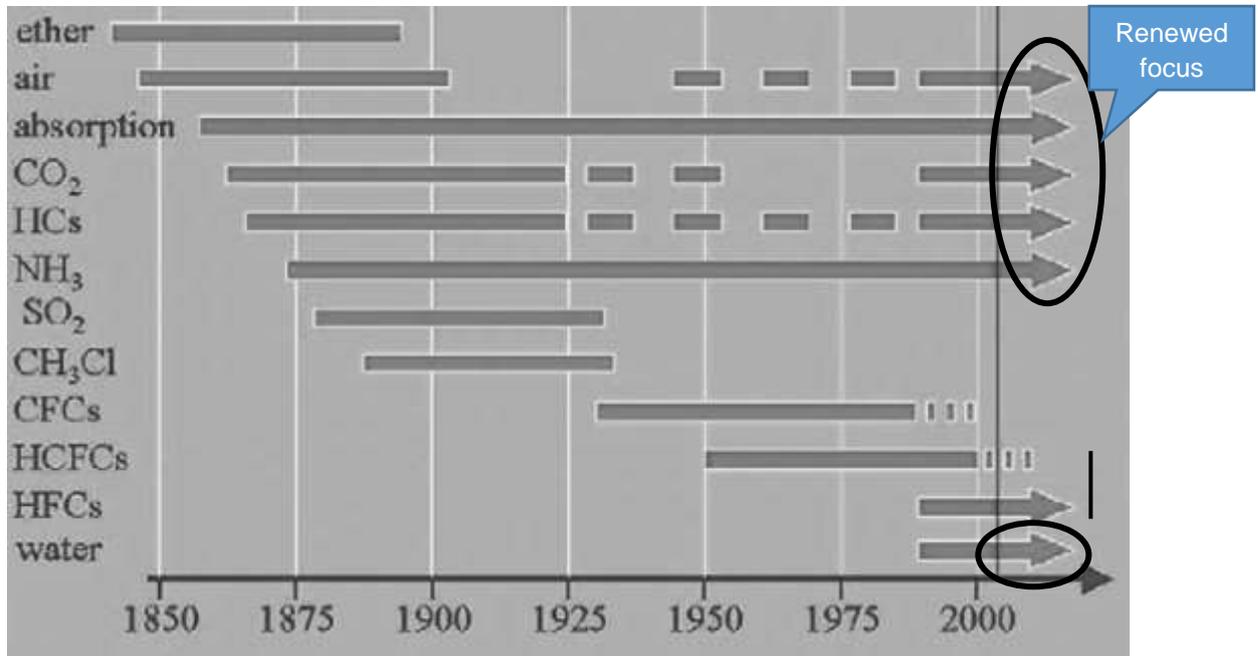
I trust you are all well and healthy? "Health is wealth" as the late Steve Jobs said. It's been huge privilege to serve SAIRAC and its members for the last year and I thank you for your support. We have had a busy year with its challenges but I believe we have also had many successes and achievements to be proud of.

I think it would be suitable to firstly thank all the SAIRAC committee members in each of our four centers (Johannesburg, Durban, Cape Town and Port Elizabeth) for all the time that they have offered in the last year towards furthering SAIRAC's causes. It is an incredible act of service to folks you don't even know in many cases.

A Primary focus area for SAIRAC in the last 12 months revolved around the application off natural refrigerant as long term energy efficient solutions to limit direct and indirect (from the energy consumed to operate a HVAC & R installation) Global Warming. An interesting fact to consider is that many of the natural refrigerant was commonly used at the turn of the 1900's. Ammonia (NH₃) being the steady Eddy all along. CO₂ applications was limited to conditions where condensing temperatures could be kept below 29°C but component materials was a challenge but fortunately this is no longer the challenge it was then. In the last 2 decades we have seen the development into CO₂ Trans-critical technologies in order to operate reliably at much higher ambient conditions (not limited to a condensing temperature of around 29°C and below). Thousands of these systems are in operation globally with advances towards greater reliability and energy efficiency being made constantly. CO₂ as refrigerant in Sub-critical & Trans-critical applications offer very good environmentally friendly alternatives to HFC applications.

Hydro Carbons (HC) have made a big return in the last decade with the majority of all newly built domestic appliances operating Butane (R600a) or Propane (R290) Both of course being Hydrocarbons (HC). More recent global trend to use higher charge volumes in these systems have resulted in an accepted increase to 500g per system using an HC (R290 or R600a). With the flammability of these refrigerants requiring specific additional training in order to ensure safe design and operation.

Please see the time scale from recent article by Andy Pearson on CO₂ as refrigerant attached? (Pearson, 2005)



2 National council for 2019/20

SAIRAC's national council (NC) is made up by the president & Vice-president with the national secretary with the chair in office from each of the four regions. Meeting quarterly the NC has the task of setting goals in line with SAIRAC's constitution and the strategy required to follow through on the decisions made.

We are very happy to confirm Jaco Pieterse, the SAIRAC chairman in JHB for the last few years have be nominated and elected as SAIRAC's Vice President (VP) for the next year. Jaco has big passion for the HVAC & R sector's development and adding value to the client base the industry serves.



Two of SAIRAC's regional offices, Johannesburg & Durban, have a new chairman at the helm.

In **Johannesburg** (JHB) Robert Fox is take the torch from Jaco as chairman having served on the JHB committee for a few years already. Robert is technically very knowledgeable having compiled and updated some of SAIRAC's training material.



In **Durban** Neeraj Ramkissoom takes over from Cyril Maurel. Neeraj has served on the Durban committee as vice-chairman so he has a good understanding of what is needed to run the Durban region and add value to our valued members there.



In **Port Elizabeth** we are happy to have Deon Schmidt again serve for another term. His industry relations and willingness to share his know how is greatly valued. His trade experiece gives him great insight into current challenges and potential solutions in industry.



In **Cape Town** we are glad to have Louis Vermeulen continue his position as chairman. Louis is a keen contributor with an industry contact base across the HVAC & R industry in the Western Cape.



Grant Laidlaw, past president, has accepted continuance of his term as National Treasurer based in JHB. To have this continuance is most important towards following through with processes and upgrades that run from one year into the following. His experience from prior years serving on the national committee is most helpful.



Marlene Gamble has accepted continuance of her term as National Secretary for the next year as well. With her support the SAIRAC national council is able to function as a cohesive team. I believe her efforts towards organizing the recent Dreosti memorial lecture series was a huge contributing factor towards making it the success that it was.



As required by the SAIRAC constitution the position of President that I served in for the 2018/19 year is to be confirmed by means of a vote by the national council members. I am honored to be requested to serve the organization and its members for the next 12 month period following the vote taken at the last National Council (NC) meeting.



If you are considering joining your local committee but you don't feel comfortable then consider the wisdom (not sure to whom the credit is due but I trust they will forgive me if it is for the greater good) that everything you want that you don't currently have would be outside your comfort zone. I believe we have a good system, thanks to many before us, to aid and guide most processes.

3 SAIRAC goals

Every year we need to take a good look at our organization's constitution to ensure that we stay focused on the primary goals the organization set out for itself to achieve.

With one of SAIRAC's goals being "to promote the unrestricted dissemination of knowledge and information amongst its members by holding meetings" we are very glad to report on a full program in this regard. Each of our four centers have had a busy year with all the planning to host many technical talks and training courses. Great thanks to all our guest speakers from around the globe that have shared their knowhow and experiences so freely.

Another SAIRAC goal being to "assist in educational activities". With many short training course throughout the year this goal was also very much achieved. Many thanks to our facilitators in each case.

Adding to this "Co-operation with governmental agencies" was also achieved in the last 12 months with a very successful workshop held at the Stellenbosch university Elsenburg faculty in June. More on this a bit later in the report.

3.1 Technical Talks

The technical talks held in each of our four centers are core contributing efforts towards achieving our goals of sharing specific industry information and skills with our members.

One of our goal in this regard is to offer a substantial portion of these covering basic skills and knowledge that any newcomers to the industry might be in need of in order to develop a strong foundation. New developments are always exciting but they mostly require a sound understanding of the basics. The basics also help one to understand the relation to other theories thus building a clearer ontology of the subject matter.

An additional goal is promoting the use natural refrigerants as more environmentally friendly alternative.

In total SAIRAC hosted 25 Technical talks. Subjects covered purposefully was the application of environmentally friendly alternative refrigerants like CO₂ (R744), ammonia (R717) and hydro carbons (R290). Operational factors that could improve energy efficiency was also on the agenda.

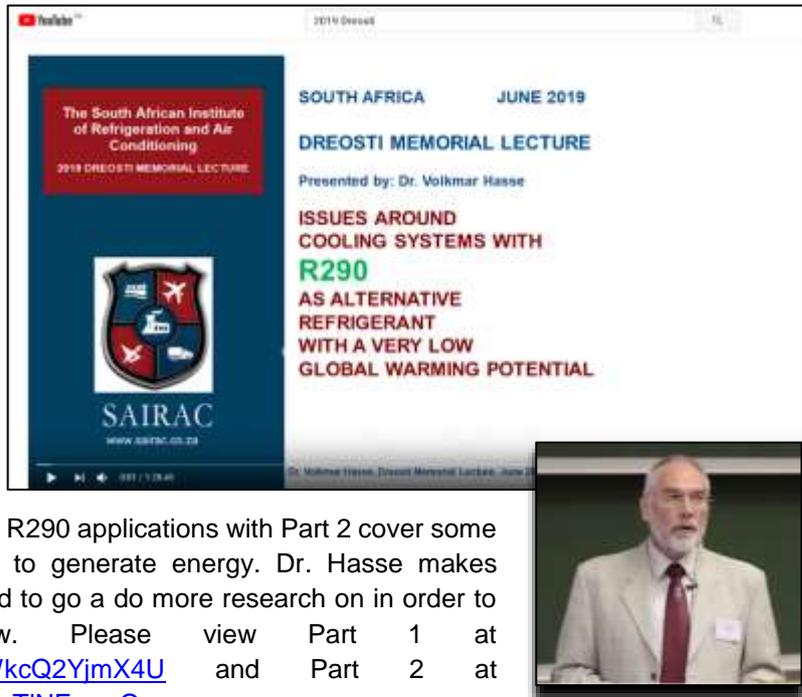
3.2 Training courses

SAIRAC has invested in further developing of training material with contributions from industry expert like Jannie Potgieter and Robert Fox. With their help we now have a more systemic solution with supporting material that will allow capable presenters to cover the subject matter thoroughly and consistently each time. The material developed and in some cases renewed covers the basics of what newcomers to our industry will find helpful and supportive towards building a world class industry. Training courses completed will also earn ECSA registered professionals CPD points. We have identified other subjects that we will be working on in the next 12 months and will implement these at each center as soon as we have them ready.

In total SAIRAC hosted 12 training course in the last year. These are offered part time in order to be more accommodating of everyone's busy schedules.

3.3 Dreosti memorial lecture series

More recently you might have had the pleasure to attending our Dreosti memorial lecture held in your area. We are most grateful to our guest speaker Dr. Volkmar Hasse that offered a lifetime of experiences and more specifically the future applications of R290 as a very viable option to use as an environmentally friendly alternative.



We recorded the Cape Town leg of this event and it is available on YouTube for all to view. Part 1 covers R290 applications with Part 2 cover some environmentally friendly alternatives to generate energy. Dr. Hasse makes mention of much that one would need to go a do more research on in order to get a more holistic view. Please view Part 1 at <https://www.youtube.com/watch?v=WkcQ2YjmX4U> and Part 2 at <https://www.youtube.com/watch?v=NaTINFzmzQw>.

Halocarbon	Atmospheric Lifetime (years)	GWP 100 years	GWP 20 years
CFC-12	~100	10,300	10,800
HCFC-22	12	1,780	5,310
HFC-32	4.9	675	2,330
HFC-125	29	3,500	6,350
HFC-410a	*)	2,088	4,340
HFC-134a	14	1,430	3,830
HFC-404a	34.2	3,922	6,100
HFC-407c	**)	1,774	4,115
CO2	(>500)	1	1
Ammonia		0	0
Hydrocarbons	0.041	< 3	< 3

An interesting discussion being the broadend review of GWP figures towards a shorter and possibly more relevant time period of 20 years and not only 100 years as we commonly make reference to. In almost all cases the currently accepted GWP figures are calculated for a 100 year period.

GWP is a measure of how much heat a synthetic refrigerant traps in the atmosphere up to a specific time horizon, compared to carbon dioxide.

3.4 Western Cape Government RAC workshop

Organized and hosted by the Western Cape governmental departments in co-operation with the Bavarian state ministry of environment and GIZ held at Elsenburg Agricultural Training Institute. The event being titled as “opportunities and challenges for energy efficient and climate-friendly cooling solutions in the South African market”.



Special thanks to Sally Benson for all her efforts to maximize all the contributing efforts in a short few hours.

SAIRAC and SARACCA members contributed towards making this a very successful workshop. Ending off this event a few outcomes was discussed in group sessions with a few project application using R290 as refrigerant to potentially pursue with the support from GIZ. Soonest we have any progress to report on in this regard we will circulate the information. These projects would be Western Cape based primarily but it is not exclusive to Western Cape members or role players. Anyone wanting to contribute and learn from the applications would be welcome.

Please review this link for more info regarding the event.
<https://www.westerncape.gov.za/eadp/about-us/meet-chief-directorates/environmental-quality/air-quality-management>

No date is set yet for the workshop to be held in 2020 but we will of course circulate that soonest we have it all worked out.

4 SAIRAC Memberships

4.1 Members that passed away during the last year

Sadly SAIRAC have lost some members since the last AGM and we would like to offer our condolences to their family and friends. We are grateful to have known them and share valued time and in some cases friendships with them.

Mr. F.P. Blignaut	Johannesburg
Mr. D.M. Andriesse	Johannesburg
Mr. J.S.D. Steyn	Port Elisabeth
Mr. D.N. Watters	Cape Town
Mr. Andrew Vosloo	Cape Town

4.2 Membership statistics

All considered, we have had a very good year with many new members joining. We trust they will benefit much in doing so.

The totals at the end of June 2019 was as follows

Student	6	+1
Associate	299	+22
Associate member	287	-5
Member	444	+3
Fellow	55	+2
Total	1091	+23

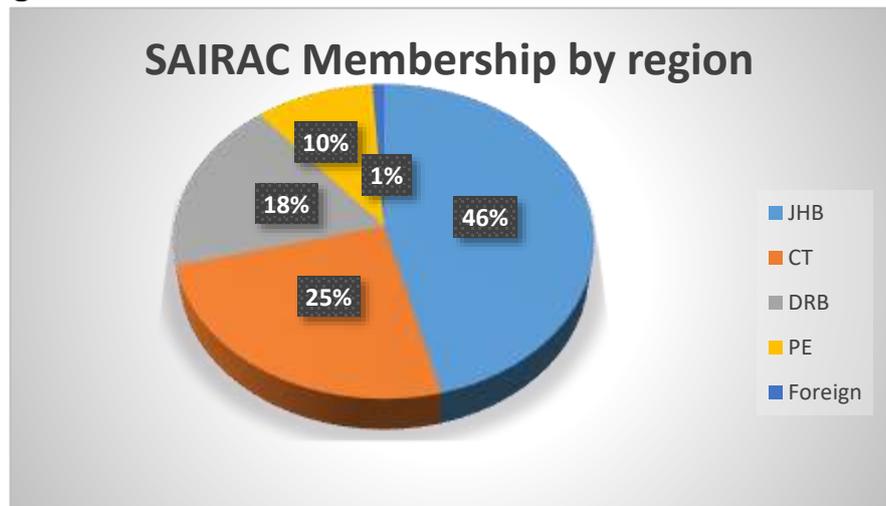
Overall it is an increase of just over 2% but an increase nevertheless. Without a constant flow of new members SAIRAC would not be able to progress and adapt. Regrettably we have had many members not renewing their membership but for the greater part this was offset by new applications. Membership renewals thus being a key focus area of each regional committee. Renewal invoices have already been circulated to our members. Please note that payments must be made before 30 September in order to renew current memberships for the next year. Please contact your local committee if you have not received your renewal invoice yet?

4.3 Membership by region

With the bulk of SARAC's members from the Johannesburg region at 46% with Cape Town following at 25% and Durban and PE at 18% and 10% respectively. Big thanks to Cyril and his team for the efforts that they have made to renew and expand SAIRAC's presence in the KZN region.

The percentage of female members remain low at 4.12 Percent by end of June 2019.

This figure has however grown from a figure of 2.17% in 2015.



4.4 Members awards

4.4.1 Trade skills - Refrigeration and air conditioning

At the recent world skills event held in Durban, David La Grange bagged the top spot in the field of Refrigeration and air conditioning. Very well done David! SAIRAC awarded him the Best Student Award. David will be competing in the Global competition held in Russia in August. We wish him best of luck and safe travels.

4.4.2 Best student - Thermodynamics

Ruth Serfontein from the Nelson Mandela Bay University received SAIRAC's award as best University student for 2019 for her results in Thermodynamic. Thanks is also due to Mr Piet Le Roux for leasing with this university reward the best student in this specific field.

4.5 Why become a SAIRAC member?

This question comes up regularly. It would vary a bit from one person to another depending on their respective career paths. SAIRAC members that are also registered ECSA professionals benefit from a reduced ECSA membership fee each year.

A reduced course fee to all SAIRAC training course will also quickly cancel out the membership fee for many.

The reduced fee to attend locally help ASHRAE lectures would also benefit many members. More on this in the next section

Membership to the IOR as an E-affiliate at 20£ (to all SAIRAC members) as opposed to a fee of 85£ to gain access to their publications. More on this in the following section

This means that for many keen learners there is much to benefit from at what I believe is a marginal fee. Just like the gym membership one needs to make use of it to get the benefit of course 😊.

5 Finances

Many thanks to our national Treasurer, Grant Laidlaw, for his efforts to manage SAIRAC's finances. Much credit is also due to Moira Fullard for her efforts as well. The finances was presented to us by Grant at the recent national AGM. We are happy to report that the SAIRAC's finance are in a healthy state. This is in part due to the sound management by those that have been in office in the past but special mention is due to Mr John Ackerman in this regard.

Each region presented their financial statements at the recent regional AGM's held. Please contact your regional secretary if you would like to receive a copy of these?

Please contact or national secretary for a copy of the financial statements Marlene Gamble or national secretary.

5.1 SAIRAC National account

A few specifics covered in Grant's presentation on the national figures that might be of interest.

- Income - In total the membership fees for the last financial year collected amounted to R898 704.00 of which 60% (R542 358) is allocated for national functions with the balance allocated to each region.
- Income – the SAIRAC website advertising generating R 38 225.00
- Income - the SAIRAC Technical Data CD sales generating R14 100
- Expenses – These covering costs like: Stationary, Administration, Auditing, Postage, Insurance, Banking charges to name a few amounted to R449 527.66.

The resulting national **surplus** being **R150 233.79**

5.2 SAIRAC Educational fund

Grant also presented the finances for the SAIRAC Educational fund.

Each of the four centers offers educational courses done at a moderate fee in each case. For the greater part these courses are self-funding or show a small profit.

A few specifics covered in Grant’s presentation on the national educational fund that might be of interest.

- Income – the Frigair expo held in 2018 resulted in an overall profit of R381 854
- Expenses – The recent Dreosti memorial lecture series came at an overall cost of R249 892.07. This covered all the venue hire costs at each center as well as all traveling cost. Our guest speaker Dr. Volkmar Hasse did not charge us for his time so that serves as an indicator of how cost events are to organize.

The educational fund therefore showing a **surplus** of **R181 756.59**

6 SAIRAC association with ASRAE, IOR & SARACCA

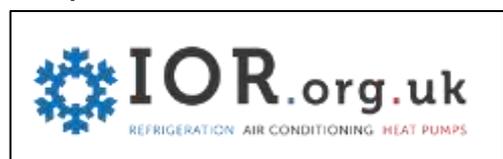
6.1 ASHRAE (The American Society of Heating Refrigeration and Air-conditioning Engineers)

SAIRAC has an International association with ASHRAE. In the last 12 months SAIRAC has entered into a memorandum of co-operation with ASHRAE’s newly establish chapter in SA. To SAIRAC members this potentially means that they are able to attend ASHRAE talks and training courses at same cost as ASHRAE members.



6.2 IOR (The International Institute of Refrigeration)

An organization almost as old and well established in the HVAC & R sector is the Institute of Refrigeration (IOR) from the UK. I believe SAIRAC and IOR have much in common in that our members vary from trade backgrounds and experience to practitioners involved in manufacturing,



contracting, consulting to name a few. They have vast resources in terms of research documents, case studies & guidelines. With European countries going through the changes that the South African Industry is faced with at the moment a keen learner has much to gain from the material available. SAIRAC members have option to register as an E-affiliate for a cost of only 20£ per year and gain access to the publications on their website that would normally be on offer at a fee and not for free. This is very good value for money.

6.3 SARACCA (South African Refrigeration & Air Conditioning Contractors Association)

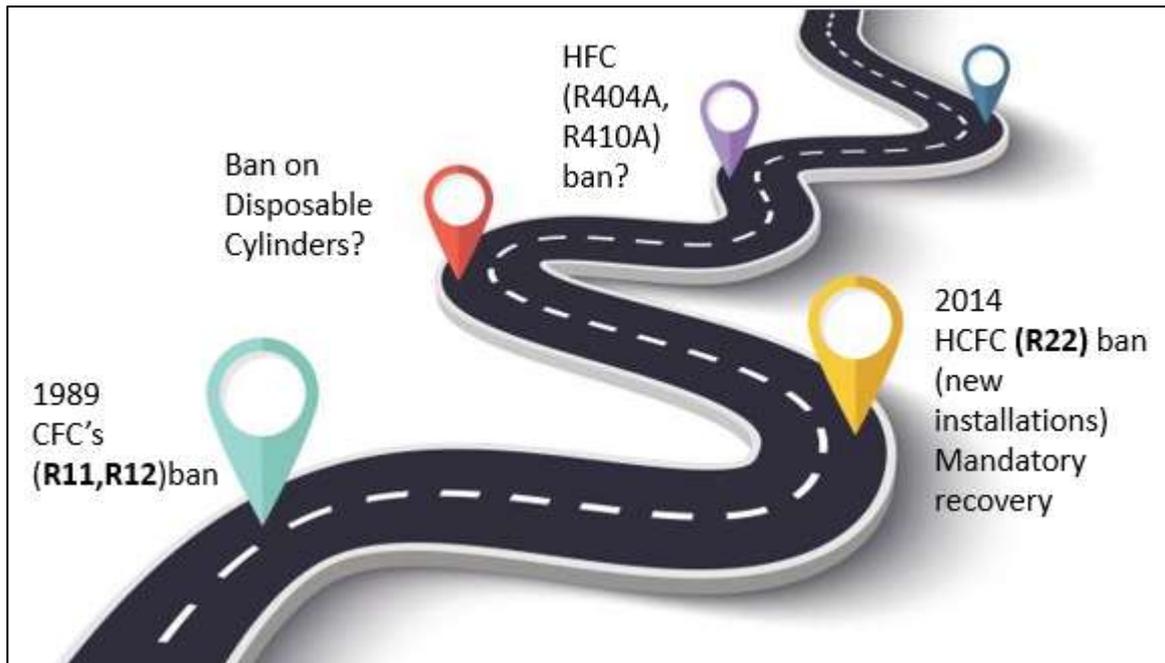
SAIRAC continues its association with SARACCA and we trust this to be to the benefit of our members. The small variation in this case being that the SARACCA membership is on offer to organizations and not individuals. SARACCA members are eligible to many offers to help fund their efforts towards training young engineering staff and artisans. Students from the Universities of Technologies require two six month practical internship periods (P1 & P2). SARACCA members that successfully assist students with this experiential training are eligible for a R10000 rebate for every six month period. Other practical short training courses are also eligible for rebates from SARACCA. Please make contact with SARACCA for more details?



7 SA HVAC & R Industry future challenges

With big challenges to face it is very encouraging to see the creative solutions that serve multiple needs from industry leaders in their respective areas of expertise. Some of the local publications like the RACA Journal and the Cold link cover much of these and make for good reading to get a good perspective on industry trends applied.

With SA HVAC & R sector functioning within a global environment much of the change that historically happened in Europe awaits the SA industry with all the relevant supporting industries also potentially affected. Many organizations like UNIDO are involved in research projects regarding the local industry and these are a good source of information to review (<https://www.ccacoalition.org/ru/resources/south-africa-hfc-inventory>)(Unido, 2017)



7.1 HCFC-22 (R22) phase out

It seems like a very long time ago now but R22 was phased out for use in new installations as of 1 January 2015. R22 import figures are lower than planned at the current dates in order to maintain existing installations. Please review the report from the DEA (Department of Environmental Affairs South Africa, 2014)

R22 is still retailing at a figure significantly less than most HFC's. Primary cause of this being the cost of from the manufacturers in the east. The low cost of R22 potentially a challenge for some to use as a cost saving measure.

Prior to the phase out of HCFC-22 was the phase out of R11 & R12 in 1989 due to the ODP CFC's result in. More recently global stratospheric sampling have indicated an alarming increase in these ODP substances. In some cases these refrigerants were found to still be used as a foaming agent when insulating panels in the east.

7.2 Ban Disposable Refrigerant Cylinders in SA

For SA the phase out of disposable cylinders is possibly one of the biggest challenges to adapt to in future. With no clear date set and opportunities to discuss this proposal many debates are undoubtedly yet to be had. The challenges might well also offer much opportunity for local industry role players to provide services and equipment in order to deal with this dramatic changes.



In the interim we would like to encourage all users of disposable cylinders to reclaim the refrigerant remaining in the cylinders where possible for re-use or safe disposal. This also makes for a very good training regime to newcomers that use the relevant equipment to recover and record as they recover the remaining refrigerant from the disposable cylinders. The figures of refrigerant remaining in the disposable cylinders are highly debated so gather your own relevant information to make reference to where possible.

Should the change take place in future it offers new opportunities in terms of equipment and services that will need to be provided? Re-usable cylinders are currently very hard to come by. These would be needed on a daily basis by most tradesmen & women or skilled service providers as it was prior to the introduction of disposable cylinders many years ago. Rental units are on offer from a few service providers at the moment.

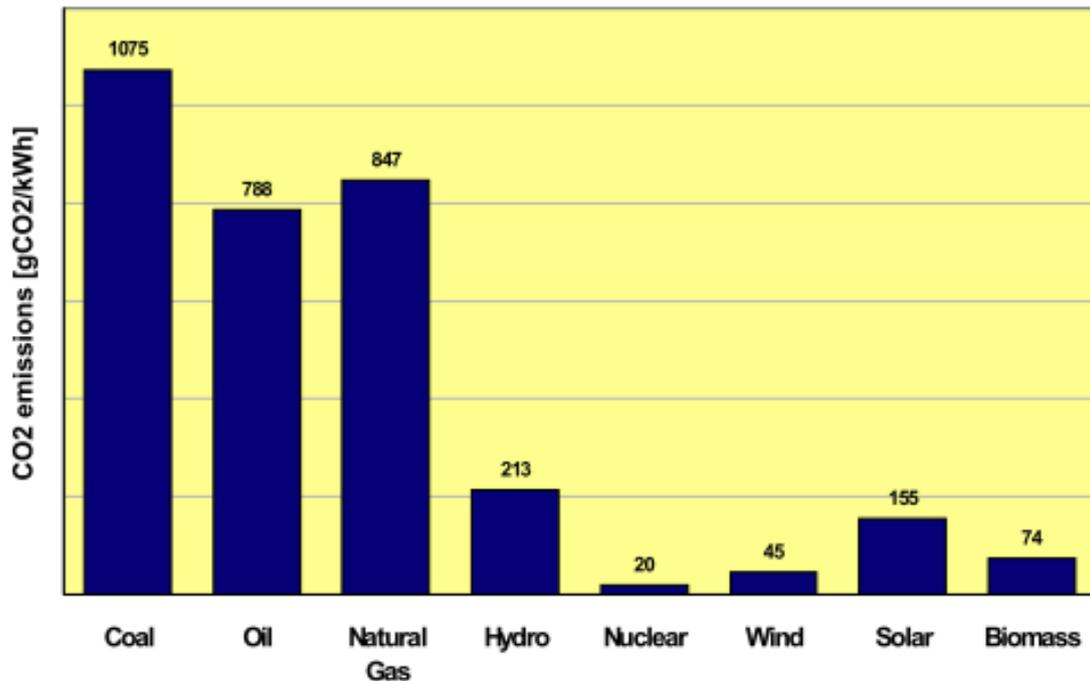
7.3 Specific trades skills in short supply

Trades skills are in big demand with this shortage being highlighted as key limitation in order to achieve healthy growth figures and adapt to global trends effectively and efficiently. A primary goal for SA being the need to be globally competitive. Please review the merSETA sector skills plan 2019/2020 for specific facts and figures if you can at

<http://www.merseta.org.za/Announcements%20Docs/merSETA%20Sector%20Skills%20Plan%202019-2020.pdf> ? An interesting figure listed is that 87% of qualified artisans find themselves employed.(Merseta, 2019)

From the recent Western Cape RAC workshop one concerning figure is the number of students from TVET colleges that are not able to complete their trade program due the lack of practical application time required (I believe this is 80 weeks for a Refrigeration mechanic) in order to potentially achieve the required skills outcomes required during a trade test. Many students have the academic portion of their trades program completed but struggle to find a workplace to gain application experience. Please explore options in this regard to offer the required work experience and utilize the academic training from the TVET colleges in a mutually beneficial agreement.

7.4 Energy consumption



The chart above offers a very graphic comparison between sources of energy generation (Maykot, Weber, & Maciel, 2004)

With SA generating the largest portion of electricity consumed from coal fired power stations indirect impact of operating an installation as it consumes energy from the national grid. A kWh of electricity generated with wind having an average impact of only 45 g of CO₂ released into the atmosphere all considered to generate 1 kWh of electricity.

An overall (construction, fuel supply & direct generation) average of 1075 g of CO₂ to generate 1 kWh of electricity. In some cases this figure of course being much higher where dated generating technology is still in use. The average CO₂ emission of 213 g for Hydro and 155 g using solar installations compares favorably. With Solar installations more common to supplement energy usage they can potentially lower CO₂ emission from the energy consumed to operate a refrigeration or cooling installation for a handsome portion of the day.

Research indicates the 17% of the energy consumed in the UK is used by the HVAC & R sectors. Undoubtable the figure is very similar or higher in SA with warmer ambient conditions so there is significant potential to contribute towards energy conservation for our sector.

8 SAIRAC organizational matters

8.1 Website

SAIRAC's national council have made progress at a new more interactive web page design. We hope to have this working in the next few weeks. We will circulate a notice when the website is updated so please be on the lookout for that and give us your feedback?

8.2 SARS registration as a non-profit organization

Many thanks to Mr Pieter Vosloo from Vosloo Konsult in PE for their efforts to complete the lengthy process. SARS have issued SAIRAC with the relevant registration number. But for a few additional forms to be submitted this process is almost completed.

8.3 Online surveys

Many of you might have gotten a link to potentially offer us your feedback having attended a technical talk or training course. This helps us to firstly get your specific feedback and secondly keep track of the results in order to analyze and improve where we possibly have room for improvement.

Please note that your reply is anonymous unless you insert your name for us to contact you specifically.

This feedback is like our return air probe of sorts. It helps us to see how far we are from the set point☺

9. Concluding

To all the industry leaders that have tirelessly worked at solutions that contributes towards saving energy a big thank you from SAIRAC's side. We are ultimately borrowing the environment we live in from our children and their children.

Ending off SAIRAC would like encourage the following to our industry role players.

- Review the viability of natural refrigerants where possible as long term energy efficient solutions.
- Substitute a portion of the energy requirements of a HVAC&R installation with an energy supply with a lower direct CO2 emission.
- Reclaim any Refrigerant safely when a current installation is de-commissioned. This particularly crucial during the refurbishment of a current installation (This is mandatory and not optional)
- Do as much as possible to reduce the likelihood of a refrigerant leak on existing installations
- Contribute in whatever way you can towards imparting knowhow and experience to newcomers into the HVAC & R sector.

Much of the results SAIRAC will be part of in future will be from maintaining desired relations and building on them going forward

I thank you for your attention. If I skipped anyone please forgive me?

Yours sincerely



Marius La Grange

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