



ATMO
sphere

business case

natural refrigerants

16 May, 2016 — Melbourne

Change 2016

- New Global Agreements
- New Technology – all dimensions
- New Standards, Regulations, Training, Technology, Commercialisation, Government Initiatives
- Impacting all HVACR sectors and the entire HVACR supply chain

Context: The Industry

Serves everyone, everywhere: *commercial, residential, industrial, transport, food, hospitality, public facilities, health care....*

Cold Hard Facts 2 based on 2012

- 53* million individual HVACR installations (\$100B),
- 2% of GDP (\$26B spend, \$6B capital investment PA)
- **22% of electricity**, (\$14B PA, 10% of national emissions)
- **12 /14 %+ of national GHG emissions** (2/4% direct emissions, synthetic refrigerants, HCFC / HFC)*
- 20,000 firms, 200,000 direct employees, 70,000 licensees – tradesmen

Source: Cold Hard Facts 2, Dept. of the Environment 2013 ,* adjusted by ARA

HVACR Sectors In Australia

HVAC

Domestic & Low Rise Commercial – Split Systems

Installations

12,000,000

Commercial Chillers

84,000

Industrial chillers and splits

100,000

Cars and Trucks

12,000,000

Refrigeration

Domestic fridges and freezers

17,000,000

Commercial display cabinets, vending

1,000,000

Industrial, Manufacturing refrigeration

80,000

Grocery Stores

10,000

Cold Stores

100,000

Transport

29,000

Hot Water & Heat Pump

11,000,000

Transition is inevitable

- About 88% of all HVACR systems in Australia use High GWP HFC, HCFC and CFC refrigerants. **Not energy efficient.**
- CFC's and HCFC's are already history.
- The Montreal Protocol will call for the phase down of HFC refrigerants worldwide.
- Australia: HFC's will be phased down by 85% over the next 20 years; probably a lot faster. **Phase Out is more likely.**
- **The future is low GWP synthetics vs Natural Refrigerants.**

Implications

- **For End Users:**
 - 1) **transition to natural refrigerants as soon as possible,**
 - 2) **make purchasing decisions based on energy performance**
 - 3) **be aware of commercially biased advice**
- The vast majority of conversions from synthetic to natural refrigerants offer attractive ROI's driven by energy efficiency.
- ROI's of 20 / 40 % for retrofits and 30-50% for greenfield sites NR vs. SR technologies: available now.
- Retrofit solutions are important, vast potential.
- “Drop In” is not a long term solution in the vast majority, and is asking for trouble (excepting MVAC).

Why Future Proof with NRs

Why stop using HFC:

- HFC's will almost **double global warming** if we don't stop using them. Therefore the need, urgency and global agreement.
- **There are enormous energy cost savings available (\$8-10 billion/year) via natural refrigerants in concert with optimal engineering.**
- **Significantly increased synthetic refrigerant costs:**
 - HFC supply restrictions in individual jurisdictions and “carbon” pricing.
 - Increased HFC compliance requirements: mandatory leakage monitoring, service bans on certain systems, “carbon tax”.

We Need To !

HVACR Transition in Australia is:

- Energy Efficiency
- Direct Emissions elimination
- Australia should be a leader:
 - **high growth for those that embrace transition**
 - **national competitiveness**
 - **export development, import reduction**
 - **demonstration to / with the third world**

The solutions are in our hands NOW

Beware of Obfuscation: Efficiency

Credible, unbiased energy performance assessment is rarely supplied to end-users by promoters of synthetic refrigerant based systems because:

- ✧ Comparison to natural refrigerant based solutions won't serve their purpose.
- ✧ They may not be well informed on the value of natural refrigerants.

Beware of Obfuscation: Safety

- All refrigerants are dangerous if not delivered by trained professionals.
- Safety is not a distinguishing factor by refrigerant: synthetic or natural.
- Low GWP synthetic refrigerants are **flammable and toxic**: TFA, products of combustion (HF and COF₂) are lethal.
- Moderate GWP synthetics are not low GWP – 20 yr. GWP is the right measure
- Global refrigeration standards development is heavily influenced by synthetic refrigerant proponents.
- Natural refrigerants proponents have developed codes for natural refrigerants.

SAFETY

HVACR Safety is about one thing:

- Trained engineers and technicians
- That's everyone that has direct responsibility for HVACR performance – about 100,000
- Training in Australia is in disarray
- Australian Standards remain under review

Implications for the HVACR Industry

From a procurement POV 2035 is **NOW**:

The Australian HVACR industry has the opportunity to:

Reduce the energy cost of HVACR by 60%+ (\$8B PA)

Reduce GHG emissions by 50%

Reduce national emissions by 7% from HVACR alone

These opportunities are commercially warranted!

We need a great deal of training and education

The Consumer Goods Forum

Over 400 multinational food retailers and suppliers:

- Sainsbury, Tesco, Carrefour, Woolworths, Metcash etc.
- Unilever, Nestles, Kraft, Coca Cola, Red Bull, etc.

Member revenue over \$5 Trillion pa.

Comprehensive Sustainability Strategy:

- ***Transition to natural refrigerant based technology by 2015***
- ***All sectors of refrigeration – the mission critical Food Cold Chain***
- ***No Equivocation, ongoing R&D for performance improvement in collaboration with Refrigeration Suppliers .***

Other Sources on Natural Refrigerants

- **Consumer Goods Forum**
- **The Green Cooling Initiative**
- **Real Alternatives**
- **Environmental Investigation Agency**
- **Institute For Governance & Sustainable Development:**
- **The Natural Voice**
- **Shecco: R744.com, Hydrocarbons 21.com, Ammonia 21.com, Accelerate**
- **Refrigerants Naturally**
- **The International Institute of Refrigeration**
- **The International Institute of Ammonia Refrigeration,**
- **Climate and Clean Air Coalition**
- **Eurammon**
- **GIZ Proklima**
- **UNEP Ozone Secretariat**

Go to the [ARA website](#) for links.

What do we need?

Awareness at the end-user level to generate the demand for change.

Training and education in new refrigeration technologies from trade to tertiary level – currently tertiary level training in refrigeration technology is not offered in Australia.

Commitment:

- ✓ **A ban on the use of HFC's** in all new vapour compression systems with a charge > 5 kg effective 2025 – ban to be announced **now**
- ✓ **A ban on the use of HFC's** in all new systems with a charge < 150 g effective 2025 – ban to be announced **now**

Innovation:

- ✓ **Across all HVACR sectors**
- ✓ **Integrated Energy Efficiency Engineering**
- ✓ **Real Product Stewardship**

What do we need?

Engagement by the specifiers to the industry:

- Mechanical Engineering consultants
- ESCOs
- Facilities managers
- Architects
- Builders & Contractors

Government involvement in communicating the value of Natural Refrigerant based technology and the importance / sources of energy efficiency.

Government procurement as required by G20 et al

Reduced Government barriers to change (Local, State, Federal) & modernization of regulations that are based on the past rather than the future.

Energy performance benchmarking for all significant HVACR applications similar to that offered by the IECC (International Energy Conservation Code) for the built environment



ARA

**Australian
Refrigeration
Association**

Forging the Future for Refrigeration and Air Conditioning

Contacts:

Tim.Edwards@ausref.org.au

02 4861 5355

0405 324 834

Tell Me What You Need !

Access the Resources on our website