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Updates and Examples from Down Under

-A snapshot of the CO2-e priced RAC industry one year in…

Brent Hoare, Executive Director,
Green Cooling Association
Montreal Protocol 33rd OEWG
Bangkok, Thailand, 28 June 2013

Overview

Impacts of the CO2-e carbon price levy on high GWP HFCs

- Summary of Impacts of the #HFCs Levy
- The Inside Word – End Users Demanding "#NaturalRefrig"
- NH3 for Air Conditioning – Fact or Fiction?
- Fast Freeze International – Replacing R22 cold stores with NH3
- Pioneer International AC
- HyChill Refrigerants – Surging Ahead!
- Coles Supermarket Site Visit – A "bog standard" CO2 Cascade system
- Addressing the Training Need
- "Framing" #NaturalRefrig as Solutions not Alternatives

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Refrigerants in “MSM” - finally!

Greenhouse gas Redoubled effort to recover fluorocarbons

Rise in appliance sales prompts fears of a climate time bomb

Peter Hannam

Australia's rush to acquire air-conditioners and fridges is creating a greenhouse gas time bomb, which the Greens and environmental groups say existing regulations, including the carbon tax, are ill equipped to defuse.

The country has at least 45 million cooling devices, up from about 30 million in 2007, with 1 million airconditioners alone sold each year for home use and a similar number in new passenger vehicles.

The vast bulk of the equipment uses fluorocarbon coolants which, though small in weight – about 600 grams per car – can pack as much as 10,890 times the global warming impact of carbon dioxide when released, either through leakage or when the device is disposed of.

The deliberate release of such gases has been illegal since 1989, but with as little as 25 per cent of the gases recovered each year from discarded devices, the rest of the gas is vented with impunity.

Refrigerant gases have been a problem for decades. Australia passed the Ozone Protection Act in 1989 as part of global action to phase out chlorofluorocarbons and hydrochlorofluorocarbons when the chemicals were found to be destroying the ozone that blocked dangerous ultraviolet radiation from space.

The replacement coolants, mostly hydrofluorocarbons, are potent greenhouse gases.

Australia's refrigerant devices

- 15m car air-conditioners
- 11.5m air-conditioners in buildings/homes
- 17m domestic fridges
- 1m cold storage

Approximately 45 million

Sources: Industry, US EPA

This month, US President Barack Obama and China's President Xi Jinping agreed to “phase down” HFC consumption.

Debate swirls over the contribution to global warming from HFCs – the government puts the impact at less than 2 per cent of Australia's emissions now but experts say the rate is 4 per cent or higher since CFC and HCFC venting is excluded.

Inside
Insurers criticised for opposing recycling
BusinessDay, Page 27

The White House said the US-China pact on HFCs would help cut 90 gigatonnes of carbon dioxide equivalent by 2050, or about two years' worth of worldwide emissions now.

Australia imports about 7000 tonnes of fluorocarbon-based refrigerants annually. Refrigerant Reclaim Australia, a body set up by industry in 1993 to collect such chemicals for destruction, disposes of about 500 tonnes a year of HFCs and HCFCs, and about 40 tonnes of the now-banned CFCs.

“I don't believe the enforcement around that end-of-life recycling is adequate to ensure that all of the refrigerant is being recovered,” RRA general manager Michael Bennett said.

Illegal discharge of the gas attracts a $51,000 fine but only one penalty has been imposed, the government said.

The government is committed to imposing the law and will spend another $7.2 million next financial year for extra enforcement and destruction programs.

Tim Edwards, president of the Australian Refrigeration Association, which advocates the end of all fluorocarbon use, said the most effective action would be to jail or fine heavily those who broke the law.

Fairfax Media (SMH, The Age) Wed 19 June 2013

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Impacts of CO2-e Pricing on HFCs in Australia

- Gillard Government "Clean Energy Future" legislation - commenced on 1st July 2012
- Was developed by a "Multiparty Climate Change Committee" comprised of Labour, Greens and 2 Independents
- Main feature is a "fixed price" (not "tax") for 3 years moving towards a floating price and a tradable permits scheme in 2015
- HFCs included by levy to establish CO2-e price
- Wholesalers raised prices significantly above amount required by levy, accused of "evil price gouging" by Climate Change Minister Greg Combet
- Orchestrated media and lobbying campaign conducted prior to and following commencement of levy, often repeated claim levy will be ineffective due to alleged "inelasticity of demand" in the refrigerant market
- Substantial industry association activity to develop response strategies, and seek greater assistance and support to adapt, focus on standards
- New recovery and destruction incentives scheme to be introduced in July 2012 - http://www.environment.gov.au/atmosphere/ozone/destruction-program/index.html

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Australian CO2-e HFC Pricing

Refrigerant	GWP	$/kg
R134a	1300	$29.90
R125	2800	$64.40
R143a	3800	$87.40
R32	650	$14.95
HFC365	794	$18.26
HFC245	1020	$23.46
R404a	3260	$74.98
R507	3300	$75.90
R407C	1525	$35.09
R410A	1725	$39.68

- NB: All GWP's are taken from the IPCC Second Assessment Report (SAR/AR2)

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Impacts of CO2-e Pricing on HFCs in Australia

Observed Impacts:

- Difficult to quantify as little if any published research is yet available
- Imminent release of "Cold Hard Facts 11" (Brodribb & McCann, Expert Air) will provide detail on size and character of RAC industry
- Widespread reports of significant stockpiling by major end users
- Consumption of R-404a declined from around 800 tonnes pa to 650 tonnes, a reduction of ~ 15% - "Wither inelasticity of demand?"
- HFC sales have fallen significantly presumably beacuse of greatly increased care and stewardship, preventative maintenance, recovery and reuse
- In the automotive AC market prices for 22kg HFC-134a cylinder have risen from around $300 to $1200-$1400, accordingly inertia has waned and HC sales volumes have increased by around 40% or more
- Supermarkets have long been planning for the carbon price and the need to reduce high maintenance costs, now all new systems are CO2 cascades
- Cold storage and food production facilities are now pursuing opportunities to avoid use of HFCs by replacing existing systems, or in selection of new ones

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The Inside Word...

It's hard to quantify the impacts because reliable studies are unavailable yet, but here's what leading practicitioners at the coal face are saying

All I can say is it really works, in spite of what the usual suspects are trying to say. I have SOOO many clients trying desperately to get away from HFCs now, it's just great!

The impending final phase-down of R22 in 2015 is complementing the levy nicely too, putting many sites under dual pressure - having to get rid of R22 but not wanting to go to HFCs to do so.

"Rorting" is a real worry. Some contractors are charging > $300 per kg for R404a! Most contractors charge <$200, which is OK, but some are making a killing...

2012 continued to be a good year for us. A significant increase in sales of chillers and smaller ammonia equipment compared to previous years.

NH3 for Air Conditioning – Fact or Fiction?

- Ammonia has recently been used as the primary refrigerant in a large scale air conditioning system servicing a local Council administration building in South East Queensland, Australia.
- The new NH3 based air conditioning system replaces two HCFC 22 based air conditioning systems.
- The secondary refrigerant is reticulated chilled water.
- The new plant incorporates energy recovery by means of discharge gas desuperheaters.
- Net result: 50% reduction in power consumption, $100,000 pa savings to Council, large reduction in maintenance.
- Designed and commissioned by Scantec Refrigeration - detailed paper available, case study in preparation.
- Suitable for wide application in high ambient temperature regions to assist HCFC phaseout.

1. Existing Roof Top Plant Room with Two Air Cooled Water Chillers and Chilled Water Pumps
3. Open Drive R22 Compressors
4. Remote Air Cooled Roof Mounted R22 Condenser
5. SABROE HeatPAC Packaged Water Chiller employing NH3 refrigerant
6. Future Heat Recovery System
8. Plant Room Layout Showing NH3 Chillers and Cooling Towers

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Fast Freeze International

- Situated in Casino, Northern NSW. Owned by Fast Freeze International, Trading Company Richmond Dairies

- Fast Freeze International processes milk from their own direct supply farms and other milk processors to produce a range of frozen dairy products used as ingredients by other manufacturers, mainly for the export market.

- Obtained a Federal Goverment Clean Technology Investment Program subsidy of over 25% for an $800,000 replacement of two aging and inefficient freezer rooms.

- Central to the new state of the art refrigeration system is a roof mounted, containerized, two-stage ammonia refrigeration plant using Sabroe CMO reciprocating compressors on variable speed drive (VSD) operation supplied by Johnson Controls. The low temperature system operates on pumped liquid recirculation, and the chilled spaces use direct expansion.

- Cuts the electricity use and carbon emissions intensity of Fast Freeze International's refrigeration system by approximately 65% and will result in savings of $27,000 in electricity costs per year. Fast Freeze International's Chief Engineer, Nick Pierce, said "We are continually looking to improve the environmental impact of our operations and reduce our energy use. The amount of energy that can be saved with a well-designed refrigeration plant is very impressive."

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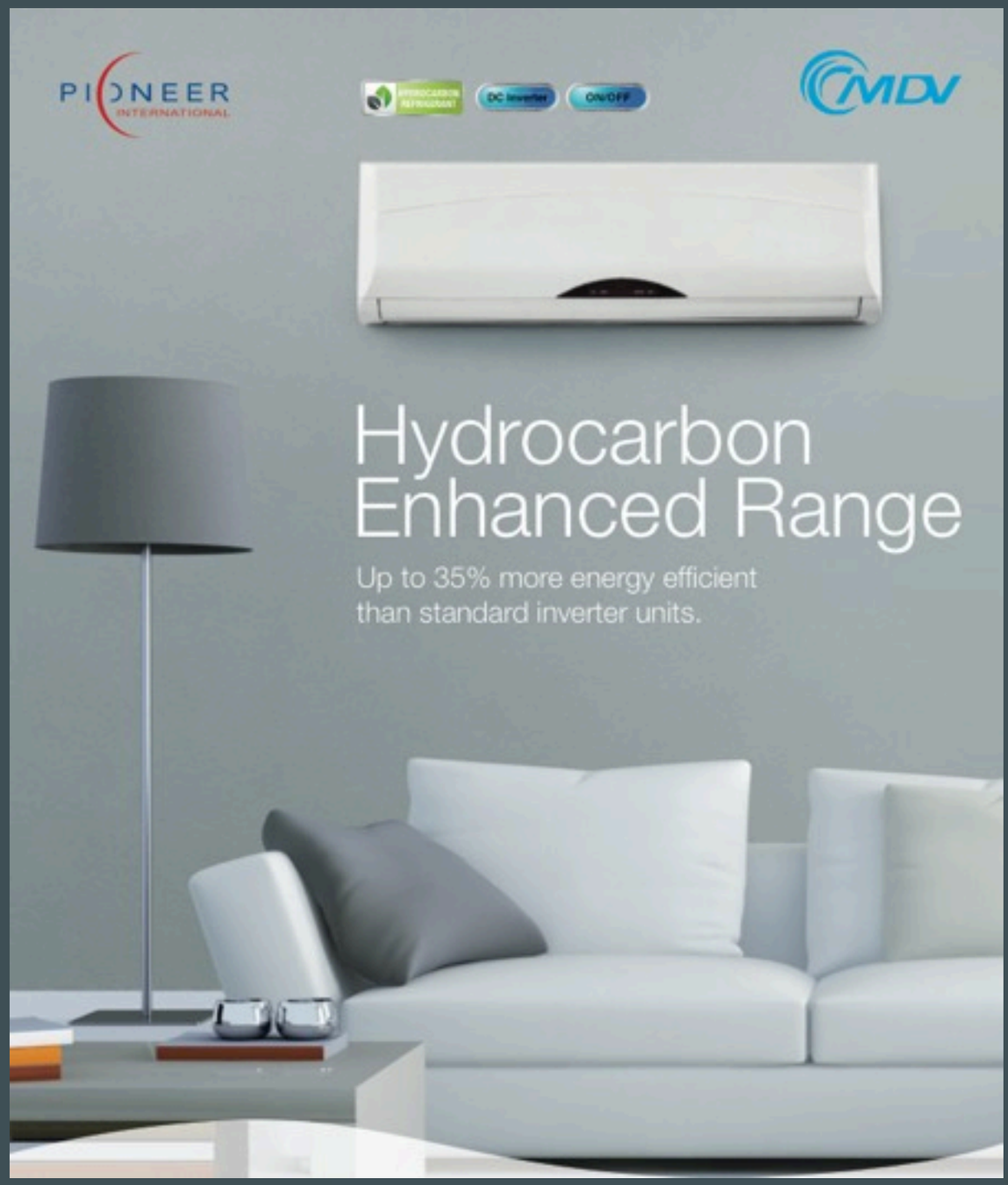
Pioneer International AC

- Australian owned, based in Western Sydney, George Haydock, MD
- M60 propane supplied by EnGas Ltd, WA based hydrocarbon producer
- Extensive dealership network, sophisticated e-marketing strategy
- http://pioneerair.com.au/all-blog-articles/



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HyChill Refrigerants

Surging Ahead!

HyChill Hydrocarbon Refrigerant

- Total sales into Australian Automotive AC aftermarket:
- In excess of 334,000 kg (334 tonnes) of "Minus 30" (and under previous brands of ER12 and HR12) into the automotive service market in Australia alone.
- This represents in excess of 1,200,000 (1.2 Million) vehicle charges, with no safety defect trend even in it's current application as a drop-in replacement in existing R12 and R134a systems.
- The consumption (and subsequent emission over time) of 800+ tonnes of f-gases has been avoided by using these hydrocarbons.
- Export sales growing rapidly too.

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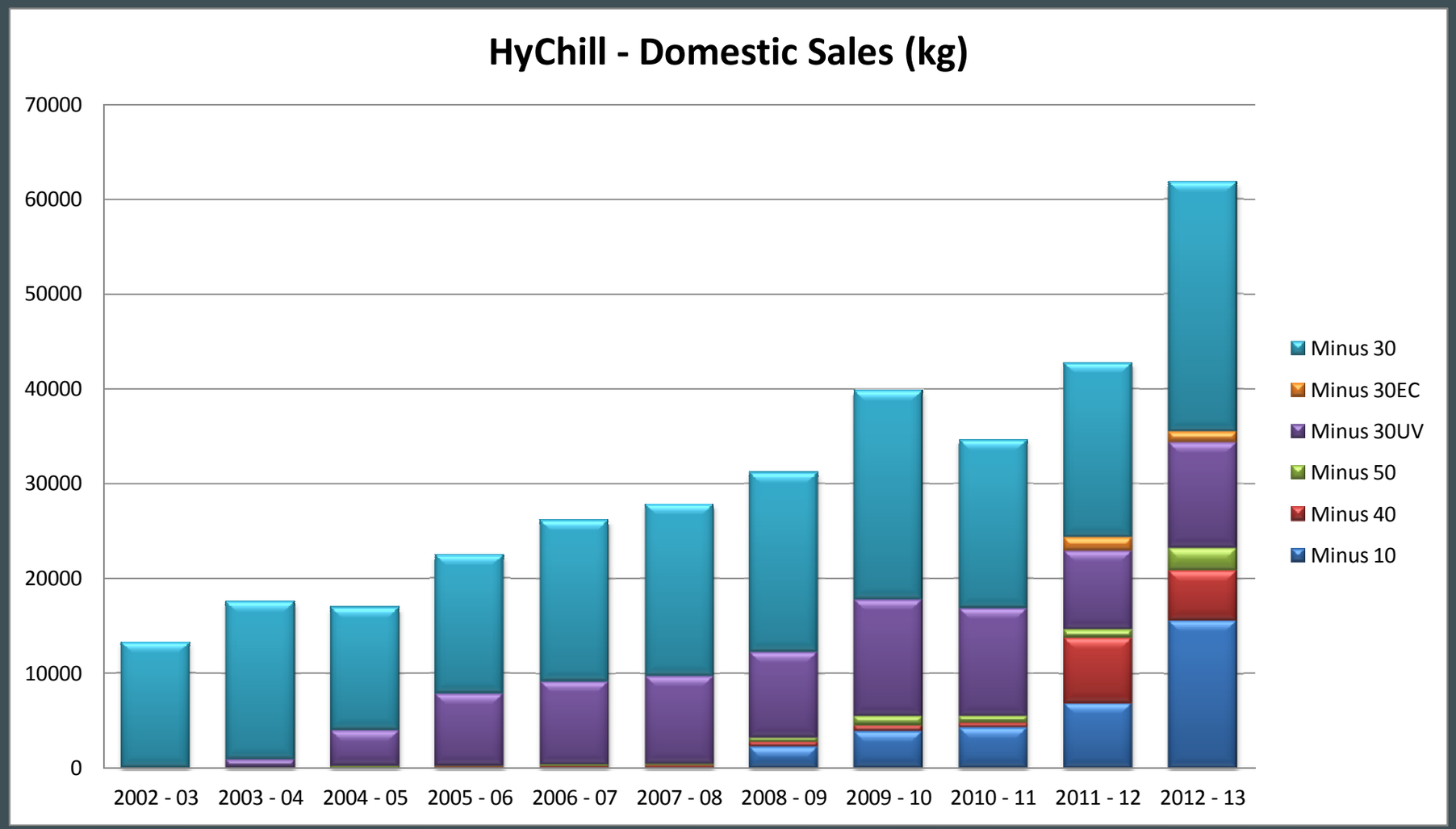
HyChill Refrigerants

- Steady growth in volumes over past decade has been significantly boosted as a result of the CO2-e levy on HFCs from 1 July 2012

- **Minus 30**
  - R290/R600a Blend
- **Minus 30EC**
  - with R170 (Ethane)
- **Minus 30UV**
  - with UV dye
- **Minus 50**
  - R290/R170
- **Minus 40**
  - R290
- **Minus 10**
  - R600a



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Coles Supermarket Site Visit

- Situated in the Katoomba, Blue Mountains, 2 hours West of Sydney, this is one of at least 110 cascade CO2 supermarkets in Australia, 40 now in New Zealand, including 3 Transcritical CO2, 1 under construction.

- Site visit conducted in Jan 2013 by Senator Doug Cameron, articles published in several trade and news journals.

- 1.2 tonne charge of CO2, and 400 Kg of R134a on the "high" side is contained inthe plant room. All refrigerant in the low and medium temp cabinets is CO2.

- Using this system to run both refrigeration and air conditioning cooling demands is estimated to deliver around a 7% reduction in energy consumption compared to conventional stores.

- All new Coles stores are of this type, ongoing innovation and international collaboration by Coles engineers.

Photos by David Brazil

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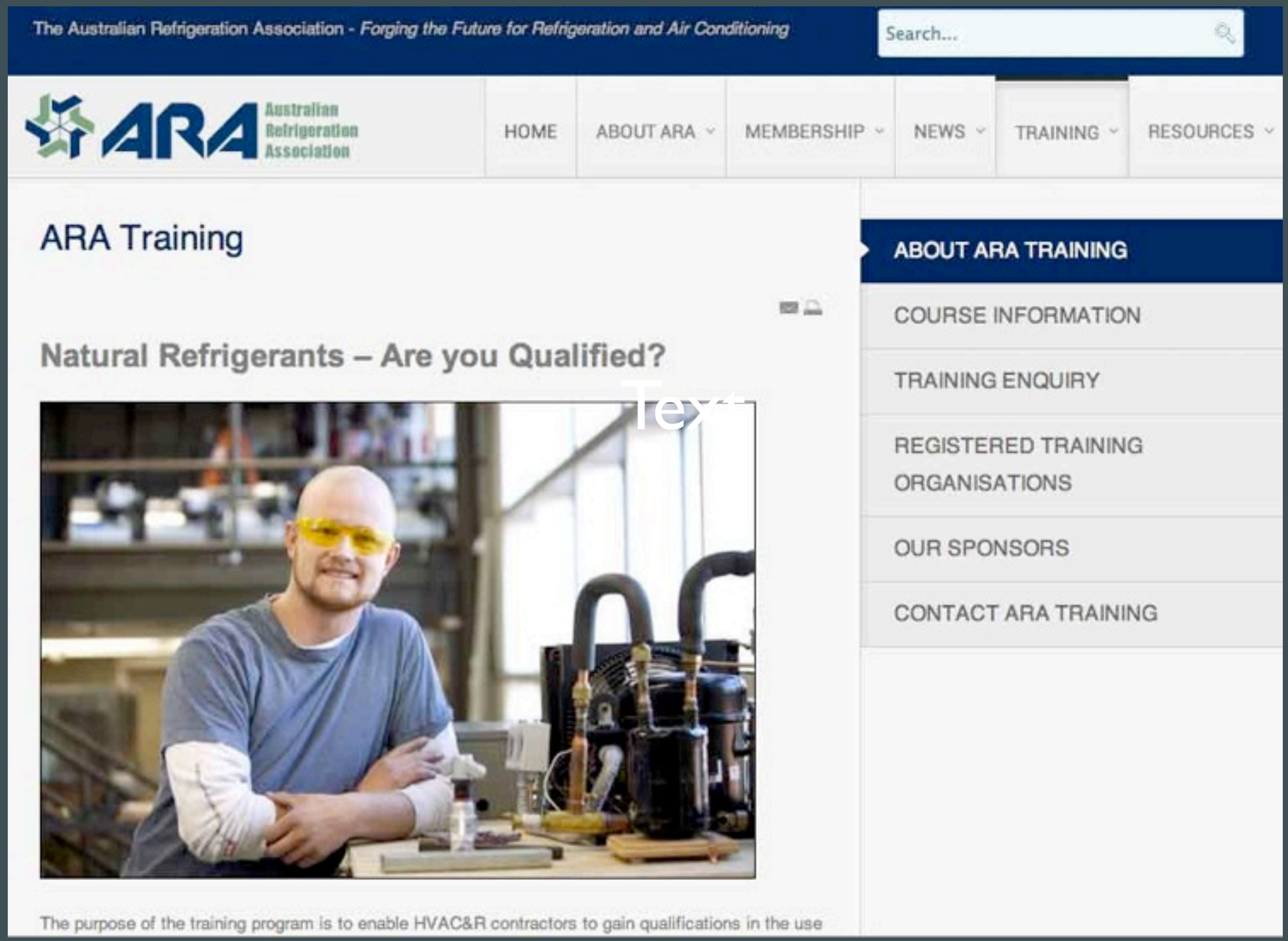
Addressing the Training Need

www.ausref.org.au



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Let's "frame" the solutions?

"Alternatives" or "Solutions"?

Nothing 'Alternative' about #NaturalRefrig - Original Solutions!

- Framing focuses on "the words, images, phrases, and presentation styles" that communicators use when relaying information to recipients (thanks, Wikipedia).
- Language we use powerfully shapes perceptions and attitudes.
- By perpetuating the framing of Natural Refrigerants as "Alternatives" rather than "Solutions" (or "options") we are giving up control of the language, and enabling perceptions of NatRefs that imply they are on the fringe, untested, unproven and all the doubts and questions that have been raised about them are likely to be true...
- Deceptive and misleading environmental claims are an extreme form of framing that severely erodes our competitive advantage.
- Challenge them or lose?

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Many thanks for your attention!

- Contact for further information:

  brent@greencooling.org

  http://www.ausref.org.au

  http://greencooling.org

  @brenthoare @austref @greencoolingass

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