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AIRAH Industry Summit 2012

Transitioning the Australian HVAC&R industry to a low emissions future

Meeting report and outcomes

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About AIRAH

AIRAH is the recognised voice of the Australian air conditioning, refrigeration and heating industry. We aim to minimise the environmental footprint of our vital sector through communication, education and encouraging best practice.

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Executive summary

In response to the new “carbon tax” and the related carbon-equivalent price (CEP) that will be levied on some HFC refrigerants AIRAH organised and facilitated an industry summit to assist key stakeholders identify the issues, solutions, potential barriers and essential actions that should be associated with this policy implementation.

Some of the major points proposed at the summit include:

- Industry needs help to transition to a low-emission future. It is not sufficient for the government to impose new charges and expect market forces to resolve all the issues. Government and industry need to work together to ensure that the required policy outcomes are achieved.
- Revenues generated by the refrigerant CEP should be directed back to the industry to fund the required governance structures, industry communications, licensing and enforcement programs, training and education programs and end-user initiatives.
- A joint industry-government council should be formed. This council should be given the resources and ability to respond to issues and adapt to changing circumstances caused by the implementation of the carbon tax.
- More robust and proactive licensing and enforcement regimes must be implemented to prevent inappropriate, unsafe, fraudulent or criminal activity.
- Improved communications and trusted technical information urgently needs to be provided to industry to ensure that the policy is implemented correctly and does not give rise to serious safety issues and other perverse outcomes.
- New standards, codes of practice, training and education resources must be developed to underpin the transition to a low-emissions HVAC&R future.

This report outlines the detailed discussions and conclusions agreed at the industry summit. It will be used to inform government of the industry issues and to help develop an industry roadmap for the transition period.

Table of contents

1. Introduction and context.....	6
1.1. Background	6
1.2. Terminology	7
1.3. Welcome	7
1.4. The journey so far	8
1.5. Survey summary.....	8
1.6. Workshop sessions.....	10
2. Workshop Session 1 – Issues	11
2.1. Introduction	11
2.2. Program governance	11
2.3. Life safety concerns	12
2.4. Communications	12
2.5. Cost implications.....	12
2.6. Contractor impacts	13
2.7. Small business impacts	14
2.8. Market responses	14
2.9. Support for low GWP refrigerants	15
2.10. Perverse and unintended outcomes	16
2.10.1. Increase in HCFC use	16
2.10.2. Impacts on system energy efficiency	16
2.10.3. Impacts on the industry service quality	17
2.10.4. Fraudulent or criminal behaviour.....	17
3. Workshop Session 2 – Solutions.....	18
3.1. Introduction	18
3.2. Funding solutions.....	19
3.3. Co-ordinating council	19
3.4. Communication solutions	19
3.5. Regulation and enforcement solutions.....	20
3.6. Training, education and trusted information solutions.....	20
3.7. End-user initiatives	21

3.8.	Other solutions	22
4.	Workshop Session 3 – Obstacles	23
4.1.	Introduction	23
4.2.	Regulatory barriers	23
4.3.	Lack of access to trusted information.....	24
4.4.	Barriers to long-term industry solutions.....	24
5.	Workshop Session 4 – Questions and actions.....	26
5.1.	Introduction	26
5.2.	Questions that require answers urgently	26
5.3.	Essential actions.....	27
6.	Next steps	29
6.1.	Introduction	29
6.2.	Immediate actions	29
6.3.	Close.....	29
	Appendix A Summit attendees	25
	Appendix B Organisations participating in the survey.....	26

AIRAH Industry Summit Report

1. Introduction and context

1.1. Background

As part of the package of legislation and regulation associated with the implementation of a carbon tax in Australia on July 1 (the Australian Government's Clean Energy Future Plan), the import of all synthetic greenhouse gases covered by the Kyoto Protocol are being "taxed" at their "carbon-equivalent price" (CEP). This refrigerant CEP charge will be implemented through the *Ozone Protection and Synthetic Greenhouse Gas Management Act 1989*.

The refrigerant CEP charge is related to the global warming potential (GWP) of the gases. The purpose of the CEP is to provide a price incentive to reduce direct greenhouse gas emissions by encouraging improved emissions management of synthetic greenhouse gases and greater use of low GWP refrigerants. A second Australian Government objective is to reduce indirect emissions by encouraging improved energy efficiency in the heating, ventilation, air conditioning and refrigeration (HVAC&R) industry.

Refrigerant gases are an essential component of the millions of pieces of air conditioning and refrigeration equipment that are integrated into every part of the Australian economy and in every home and business in the country. Refrigerants are the mainstay of an HVAC&R industry that in the 2007 "*Cold Hard Facts*" report was estimated to be worth at least \$16 billion per annum in Australia, which directly employs at least 165,000 people and is responsible for up to 7 per cent of all Australian greenhouse gas emissions.

The most commonly used refrigerant gases are hydrofluorocarbons (HFCs). These are synthetic greenhouse gases that have a GWP of between 1300 and 3900 times that of carbon dioxide (CO₂). The impact of the refrigerant CEP will include rapid and significant price increases for many common refrigerants. In some cases accumulated cost increases will be in the order of 500 per cent by the time the effects of the CEP are compounded down the supply chain to the end user.

The refrigerant CEP charge on some common refrigerants will be:

- R134a (GWP 1300) – \$29.90/kg
- R404a (GWP 3260) – \$74.98/kg
- R410A (GWP 1725) – \$39.68/kg

As part of developing a roadmap to help transition the HVAC&R industry to a low-emissions future, AIRAH called together a range of key industry stakeholders to investigate the potential outcomes of the carbon tax and refrigerant CEP, to consider ways to better manage the introduction of the CEP, and to investigate ways the industry can help government achieve the purposes and aims of the Clean Energy Future legislative package.

1.2. Terminology

The HVAC&R refrigerant supply chain can be defined in a number of ways but in this document we define the refrigerant gas supply chain as:

Refrigerant gas manufacturer (all synthetic gases are manufactured overseas)



Importer



Wholesaler



Contractor/equipment manufacturer



End user

The following terminology is used in this report:

Carbon tax – The carbon-pricing mechanism introduced through the Australian Government Clean Energy Legislative Package.

Refrigerant CEP – The carbon-equivalent price (CEP) charge being levied on the importation of all synthetic greenhouse gases covered by the Kyoto Protocol.

GWP – Global warming potential

HFC – Hydrofluorocarbon

HVAC&R – Heating, ventilation, air conditioning and refrigeration

1.3. Welcome

AIRAH president Sean Treweek opened the summit, welcomed attendees, thanked them for their time and continuing support of AIRAH, and briefly outlined the following points:

- A transition to a low-emission HVAC&R industry should consider the reduction of both direct and indirect emissions.
- The carbon tax and refrigerant CEP is a fact. The main aim of the summit is to identify and address short-term urgent issues as well as longer-term chronic issues faced by the HVAC&R in the lead up to the July 1 implementation.
- The CEP will affect the whole supply chain, and there is very little trusted information available to industry or the public.
- Many industry issues have existed for a long time – the carbon tax is the new issue but it should also help industry and government focus on long-term chronic issues such as training and skills shortages.
- AIRAH will help co-ordinate industry and government to take action.

All attendees at the meeting were invited because AIRAH believed that they could help develop solutions and implement the required actions.



1.4. The journey so far

Phil Wilkinson, AIRAH CEO, noted that the main aim of the summit was to listen to the participants' feedback, an essential part in the process for developing a road map to help transition the HVAC&R industry to a low emissions future.

Since the announcement of the carbon tax, AIRAH has been in discussion with its own membership and a range of government and industry stakeholders about the implications of the refrigerant CEP. It was noted that energy prices will increase, which will lead to increased demands for system and equipment energy efficiency improvements. The cost of many HFC refrigerants will also increase, based on their GWP and related CEP charge. The intention behind the legislation is that the direct emissions attributable to the HVAC&R industry be reduced.

Through AIRAH's continuing discussions, it became apparent there was a range of diverging views about the implications of the carbon tax and refrigerant CEP. Views ranged from fear, ignorance and confusion through to excitement and optimism about the potential opportunities. The overwhelming viewpoint, however, was one of uncertainty.

There has been very little information from government about the refrigerant CEP charge. The HVAC&R industry and its clients are generally not prepared for implementation of the carbon tax on July 1.

AIRAH has decided to take action and aid the industry transition from the present uncertainty into a low-emission future. So far, three main steps have been taken by AIRAH:

1. Developed an industry survey and invited all stakeholders to comment and to circulate it to their members and constituents for comment.
2. Invited key stakeholders to the summit to contribute intelligence, providing an open forum for discussion of the issues identified in the survey.
3. Invited all participants at the summit to provide information on existing programs that relate to transitioning the industry to a low-emissions future.

1.5. Survey summary

In the lead-up to the summit, AIRAH prepared and distributed an industry survey to solicit input from industry practitioners and related stakeholders on the effect of, and appropriate response to, the carbon tax and refrigerant CEP. All summit invitees were requested to circulate the survey to their membership base, colleagues and constituents to ensure as many points of view as possible were considered. AIRAH also invited its own membership and broader industry contacts to complete the survey.

A copy of the raw results was provided to summit attendees in preparation for the meeting.

Seventy-five responses were received from a range of sectors including HVAC, commercial and industrial refrigeration, training and education providers, and from industry participants all through the supply chain. Survey participants identified many **potential opportunities** as a result of the carbon tax/refrigerant CEP including:

- Focus on energy-efficient technology
- Focus on better engineered solutions
- Education, training and up-skilling of industry
- Transition to low-GWP refrigerants
- Better, more efficient buildings
- Innovation – solar cooling, cooling from waste heat
- Demand-management initiatives
- Focus on maintenance and upgrade of plant
- Retrofitting for energy efficiency
- Shift away from variable refrigerant flow (VRF) systems
- Improved installation and service practices (containment of refrigerant in systems)
- Research and development opportunities
- Improvement in system design, maintenance, servicing and commissioning standards
- More demand for the design of low-energy or passive buildings.

The survey highlighted a range of **issues** that may result from the implementation of the carbon tax and refrigerant CEP. However, only one of these was a new issue.

The **new issue**, put simply:

- Lack of awareness of the full implications of carbon tax and refrigerant CEP on the whole supply chain of the HVAC&R industry.

The **existing issues** identified included the need for:

- Up-skilling in new refrigerant and alternative refrigerant technologies
- Additional training and education resources for the industry
- Availability of trusted information relating to the refrigerant CEP
- Addressing leaking systems and the “top-up” mentality
- Identifying drop-in refrigerant options and practices for existing systems
- Technical information on retrofitting existing systems
- The need for new or revised national standardisation in some areas
- More comprehensive licensing and enforcement regimes
- Increased availability of equipment for low-GWP refrigerants.

It was noted the impending carbon tax provided an opportunity to focus on the existing issues faced by the HVAC&R industry, as well as the new issues.

A number of known **solutions** were highlighted in the industry survey:

- Industry communications before the July 1 implementation date are **URGENT**
- Communications must reach out to all sectors of the HVAC&R industry supply chain
- The HVAC&R industry needs:
 - New entrants to the industry
 - Better industry statistics



- Updated codes of practice, standards and other trusted information.

1.6. Workshop sessions

In order to capture the opinions and intelligence at the summit, and feed these into the development of an industry roadmap, summit attendees worked in groups to analyse and discuss the full implications of the carbon tax and refrigerant CEP on the HVAC&R industry and supply chain. Workshops were facilitated by AIRAH staff, who recorded discussion points that were reported back to the summit attendees between sessions.

Four workshop sessions were facilitated:

Session 1 – **Issues** – What are the short and long-term issues and what can go wrong?

Session 2 – **Solutions** – What are the solutions to the identified issues?

Session 3 – **Obstacles** – Why have solutions not happened? What are the barriers?

Session 4 – **Questions and actions** – What do we need answered? What should industry be doing?

Discussion points identified during the workshops are summarised in the following sections of this report.

2. Workshop Session 1 – Issues

2.1. Introduction

In order to consider required industry and government actions, the groups were asked to discuss foreseeable issues, including those raised in the survey, and what may go wrong as a result of the implementation of the carbon tax and refrigerant CEP.

There was clear agreement on the main issues and problems. These included:

- The short time-frame to prepare the industry (implementation date July 1) and an apparent lack of program governance
- Poor or no information about carbon tax/refrigerant CEP issues
- Cost increases due to a significant and sudden price increase of many HFC refrigerants
- Safety issues associated with the rapid move to low-GWP refrigerants without appropriate industry training and preparation
- Security issues associated with refrigerant theft, and fraudulent behaviour
- The potential for several perverse outcomes.



Summit attendees consider the issues.

2.2. Program governance

There appears to be no framework within the Australian Government Clean Energy Legislative Package to evaluate the success or otherwise of the implementation of the refrigerant CEP. There appears to be no specific estimates or targets of anticipated abatement that can be expected from

the air conditioning and refrigeration industry or any means to measure the success of the program in reducing emissions.

2.3. Life safety concerns

There is genuine concern that the proliferation of low-GWP refrigerants, specifically hydrocarbons “dropped-in” to inappropriate systems and applications, could lead to an increase in deaths and injuries to contractors, to system owners and to system operators. There may be a temptation for small operators to drop cheaper hydrocarbon refrigerant into systems without making the required system safety modifications. Two serious refrigeration-related explosions have recently occurred in New Zealand, one resulting in a fire fighter’s death.

2.4. Communications

With less than three months until the refrigerant CEP is imposed on HFC refrigerant gas imports there is little time to prepare industry participants and consumers/end users for the implications of the new tax.

There has been minimal communication with government about the implications of the refrigerant CEP and the fact that in some cases it may create perverse outcomes, possibly resulting in an overall increase in emissions in some instances. It appears that the Australian Government’s understanding of the full implications of this legislation is limited and, as a consequence, very little specific information has been provided to the industry.

The following “communications” issues were identified by the summit attendees:

- There is a widespread lack of awareness of the full implications, even among large and sophisticated customers and stakeholders, across the public, industry and government.
- Information hasn’t been communicated down the supply chain. Importers, wholesalers and contractors – the industry’s mainstay – are aware of the changes. But generally the least sophisticated in terms of business management don’t understand the full implications. Customers and end-users have little idea of the implications or the price rises.
- The industry is characterised by small operators, and the first they are going to know about refrigerant prices going up is when they attempt to replace a cylinder at a refrigeration wholesaler.
- Lack of information may lead to misunderstanding and conflict. It is possible that, during the initial implementation period, everyone will calculate costs and charge differently.

2.5. Cost implications

Business costs through the HVAC&R supply chain will change due to significant and sudden refrigerant price increases. The value of the refrigerant CEP at the point of import is publicised by government. This does not allow accurate calculation of the associated costs that flow through the supply chain.

Associated costs include tax reporting and administration, financing to cover the refrigerant CEP payments, insurance for loss of product, security, marketing and information to explain price rises to customers, and lost sales. The effect of these cost increases will aggregate and compound as they are passed down the supply chain from importer to the end user.

The following “cost” issues were identified by the summit attendees:

- There will be an increase of 300-500 per cent in the cost of some refrigerants, simply based on the CEP charge, without the mark-ups and indirect cost increases compounded through the supply chain.
- Uncertainty by market participants about how to price product – for instance, despite being bought prior to July 1, refrigerant held in stock will have to be insured and valued at post-July 1 replacement value. Due to stockpiling, shortages are already putting upward pressure on prices.
- The significant and sudden increase of prices is going to cause immediate cash-flow problems in the supply chain; trading terms will be difficult (before costs are passed on to the consumer). There is potential for confrontation between suppliers, contractors, consumers, and customers.
- There will be impacts on cash flow for those along the supply chain. Those at the start of the chain face large refrigerant CEP financing costs and those at the end of the chain may face significant price inflation on small quantities of materials that are essential to their trade.
- There will be capital expenditure costs to adjust to either new stocks of more expensive refrigerant gases, or the capital cost of replacing existing equipment with equipment that runs on low-GWP refrigerants.

2.6. Contractor impacts

Contractors are at the forefront of the implementation of the legislation, and will potentially encounter numerous difficulties. The summit attendees identified the following issues particularly relevant to HVAC&R contractors:

- Cash-flow issues due to the cost of stock increases and as clients push back on higher prices.
- In the transition phase, clients may try to engage contractors in long-term service contracts and fixed prices to insulate themselves from the much higher cost of refrigerant gases.
- Increasing theft of refrigerants resulting in a rise in associated insurance and security costs.
- Existing contractors may lack the necessary skills to meet the stimulated demand for alternative and low-GWP refrigerant-based systems.
- Clients may try to force contractors to absorb the cost of replacement refrigerant.
- Clients may sue for recovery of unexpected costs associated with plant failure and refrigerant loss.
- Safety risks for contractors who find themselves working on systems that might have been charged or “topped up” with an inappropriate refrigerant in a cost-saving measure.
- These safety issues continue throughout equipment life, in use, during servicing, decommissioning and refrigerant recovery.

- Technical and safety risks increase as contaminated, misrepresented or recycled refrigerant becomes more widespread in the market.
- Warranty disputes – for example, recycled refrigerants are put into a unit and cause it to malfunction. The unit is returned to the manufacturer who refuses to take responsibility for the fault and voids the warranty – how is the responsibility policed?
- As witnessed when the industry transitioned from CFCs and during the current transition from HCFCs, a range of new refrigerant gas blends will be introduced. There will be confusion as to the effectiveness and appropriate use and application of the new blends.

2.7. Small business impacts

The potential impacts on small business, and the potential for some companies to go out of business as a direct result of the refrigerant CEP, emerged as a significant issue. Small businesses exposed to this risk included:

- Small contractors, particularly at the end of the supply chain or in places or regions where prices are already elevated because of distance
- Small businesses with limited access to service providers and thus reduced competition
- Situations where there is marginal economic activity in the underlying business
- Businesses that are already under financial pressure
-
- A high occurrence of phoenix companies that “go under” as a result of cash-flow issues or liabilities when uninsured liabilities come to bear from refrigerant losses.

Some small-end users (local butchers, delis, small hospitality and restaurants) may experience financial duress as a result of their inability to maintain operating cool rooms and freezer systems. There could be health risks associated with improper refrigeration of product due to owners avoiding the costs of service and repairs, or service and repairs completed using cheap options that do not deliver effective refrigeration over the long term.

2.8. Market responses

Widespread panic-buying of refrigerant product was reported, due to stockpiling and other behaviours aimed at cushioning businesses from price shocks by buying as much pre-carbon tax stock as possible. This has already caused a shortage of gas cylinders, which, rather than being returned empty, are often being stored full in warehouses and store rooms. Some import and wholesale businesses are already having difficulty delivering orders because of a lack of available cylinders. Others are imposing limits on orders and financial charges on the use of cylinders.

As a result, the prices for cylinders are rising. This is one of the many ways this sudden and significant price increase is causing additional price rises throughout the supply chain.

2.9. Support for low GWP refrigerants

Technology for low-GWP refrigerants is well developed overseas but relatively new to the Australian market. There are a number of issues that must be addressed in Australia to ensure the industry is ready to deal with this technology. These include coordinated regulations, revised and new Australian Standards and codes of practice, and development of new training resources and licensing schemes.

A household air conditioner product charged with hydrocarbon refrigerant is already on the market, and the Australian contractor community is largely untrained in service and repair of such a product. Australia may also become a testing ground for new refrigerant blends that are pushed out into industry.

There are many issues surrounding the use of alternative and potentially flammable or toxic refrigerants in a fluorocarbon world, where the industry is familiar with less harmful substances. The main issues identified by summit attendees for low-GWP refrigerant technology included:

- There are a number of existing and alternative refrigerants that have low GWP. These refrigerants cannot simply be “dropped in” to systems that presently operate on HCFCs or HFCs without significant system modifications. To drop in the wrong refrigerant, such as CO₂, ammonia or hydrocarbons, would present huge safety issues. To replace a supermarket refrigeration system with a CO₂ system could take months of system inactivity and represent a major capital expense.
- There are major safety issues related to hydrocarbons versus fluorocarbons. Once the price of HFCs increases, there may be attempts to use the cheaper hydrocarbons, which are more dangerous if design, installation, maintenance and decommissioning standards are not correctly applied.
- Ammonia and CO₂ have flammability/high-pressure issues, and in the worst-case scenario can cause asphyxiation and poisoning. Fluorocarbons are largely non-toxic and non-flammable, but may be replaced with refrigerants that are toxic and/or flammable. This could prove dangerous in the unregulated part of the market, where individuals may try and use alternative refrigeration without adequate (or any) training.
- About 10 per cent of refrigerant comes back through the supply chain for reclamation/destruction in plasma arc/high-temperature incinerator. One company had ammonia sent back in a synthetic greenhouse gas refrigerant cylinder. An explosion resulted and the site was shut down for three days.
- A range of new low-GWP solutions may appear for trialling in Australia, including some that are inappropriate and others simply opportunistic. Industry will need to be guided.
- Synthetic refrigerant manufacturers are developing low-GWP products (e.g. hydrofluoroolefins, -s with GWPs of 4 or 6) but they are some years away from commercialisation.
- There is a huge installed bank of refrigeration and air conditioning plant that will need to be serviced for its remaining economic life. It is designed for a particular refrigerant and in many cases there is no choice but to use this.

2.10. Perverse and unintended outcomes

The following potential perverse and unintended outcomes of the refrigerant CEP were identified and discussed by summit attendees.

2.10.1. Increase in HCFC use

The refrigerant CEP has the potential to promote the increased use of HCFC (ozone-depleting) refrigerant gases. R22 is an HCFC refrigerant being phased out under Montreal Protocol commitments. R22 is presently running in at least 50 per cent and possibly 60 per cent of air conditioning equipment across the economy. HCFCs such as R22 are not subject to the refrigerant CEP because the import of new HCFCs will largely cease by 2016. However, in the interim period HCFCs will have a huge price advantage over HFCs, even though their GWP is higher than the most commonly used HFC refrigerant, R134a.

In some instances HCFCs are already being requested by buyers of large output equipment. There were confirmed reports of a large chiller order being lost because the customer wanted HCFC refrigerant not HFC to avoid the refrigerant CEP costs.

2.10.2. Impacts on system energy efficiency

It is likely that there will be destocking at the furthest edges of the supply chain and by the smaller operators who may reduce their holdings of refrigerants in response to increases in price and security costs. This may cause lead times for some repairs and servicing to be much longer (creating an energy penalty) and in extreme cases, where supplies of refrigerant gas might have to travel considerable distances to regional areas, there could be refrigerated product losses in the interim period and real economic damage to businesses.

Additionally, the following issues could affect the energy efficiency of a system:

- Under-charging plant with refrigerant (with resulting energy penalty) and overcharging the client for the amount of refrigerant actually provided.
- Smaller end users will be forced to look at cheaper options. Many may compromise long-term energy efficiency by, for instance, moving to smaller self-contained systems where the heat rejected is inside the building (energy penalty). Alternatives include installing multiple smaller systems in the place of a single larger system (energy penalty). Confirmed reports of this have been received from a major national wholesaler.
- Retrofits to move to natural refrigerants that are badly implemented or built on plant not suitable for use of an alternative low-GWP refrigerant may result in energy penalties.
- Energy penalties may be incurred as a result of maintenance being delayed to avoid the cost of topping up refrigerant. It may be more affordable in the short term to carry higher energy costs than to pay for either a full refrigerant charge or equipment replacement.
- A tendency to extend the life of old HCFC equipment (energy penalty) with increased energy costs because it costs less than upgrading to equipment charged with HFCs or low-GWP alternatives.

2.10.3. Impacts on the industry service quality

Several issues were raised regarding downward pressures on the quality of service delivered by the industry. The following points were made by summit attendees:

- Massive increase in project values and rapid increase in demand for alternatives bringing in many more unlicensed operators with “quick fixes” and “cost-saving options”.
- Proliferation of cheap, “quickie” backyard modifications with poor (and potentially disastrous) safety and energy-efficiency outcomes.
- Some may act as if they can now release refrigerants to the atmosphere because they have paid the tax to pollute.

2.10.4. Fraudulent or criminal behaviour

Several issues were raised regarding potential fraudulent or criminal behaviours in the industry. Summit attendees were concerned about the following:

- Recycling old or contaminated refrigerant as new refrigerant – this has flow-on implications for equipment and service warranties, insurance and energy use.
- Theft of cylinders of refrigerant from importers, wholesalers, contractors and refrigerant technicians’ vehicles.
- Theft of refrigerant from larger refrigerating systems. This could be extremely damaging and disruptive, particularly in the cold-chain and retail sectors, with food and stock losses highly likely. Building air conditioning systems may also be stolen. Additionally, there may be losses to atmosphere during theft and while thieves and black market operators are handling stolen product.
- Export of cylinders marked as containing high-GWP refrigerants for the purpose of getting the export rebate – but containing nothing, or useless refrigerant that might otherwise have been destroyed.
- Smuggling of high-value refrigerants into the country by air and sea to avoid refrigerant CEP collections at the border. Illegally imported product (with no CEP charge) raises the possibility of 300-500 per cent profits on the sale of completely legal substances.
- Insurance fraud – “someone left the valve open and \$100,000 worth of refrigerant got away” is among many possibilities for making insurance claims for refrigerant that might never have been there in the first place.
- Replacement or topping up of charge with contaminated refrigerant, incomplete charge replacement by unscrupulous operators, or mixing of refrigerants (top-up with the wrong refrigerant) may lead to poor energy and safety outcomes.

3. Workshop Session 2 – Solutions

3.1. Introduction

According to the 2007 *Cold Hard Facts* report, the HVAC&R industry is responsible for up to 7 per cent of national greenhouse gas emissions (around 40MT CO₂e). It is clear the industry needs to transition to a low-emissions future. It is possible to manage this important transition. However, doing so requires a co-ordinated and comprehensive approach involving action by both government and industry. Industry is willing to work with government and end users to manage this transition.

Summit participants were asked to consider how solutions, both existing and new, could be applied to mitigate the issues highlighted in the first session.

There are a number of solutions to the short-term and immediate issues discussed in session one, and many for the long-term and chronic issues facing the industry. All solutions need a co-ordinated approach by key stakeholders including state and Commonwealth governments, HVAC&R industry bodies, licensing bodies, training and education representatives and end-user associations. Additional resources, a political will to take action and bureaucratic support to move rapidly are also required. The industry is willing to do everything possible to garner support and take effective action.

There must be industry consensus on the prioritisation of issues, in order to ensure an effective approach to developing the solutions.



Summit attendees discuss the solutions.

3.2. Funding solutions

Implementing solutions will be costly. Yet an important first step is to determine a source of funding. It was suggested that some of the revenue collected from the refrigerant CEP be returned to the industry to help in its transformation. Yet there are no government plans, of which the industry is aware, for any of the funds to be made available to assist in the transition phase, or to resolve the long-term and chronic training and human resources shortages faced by the industry.

3.3. Co-ordinating council

The majority of attendees agreed there is an urgent need for an industry/government co-ordinating council or body with a brief that gives it the resources and the ability to respond quickly to changing circumstances. This body should develop a framework through which all parties can collaboratively address the longer-term and chronic industry issues. It should be able to provide responses to industry questions, source funding for industry bodies and to advise government on how to respond to issues as they arise.

The industry needs to be guided through this transition, and it is not sufficient for government to simply expect market forces to resolve the many issues that will be created by the carbon tax and refrigerant CEP.

3.4. Communication solutions

A number of urgent communication solutions were identified to address the lack of clear and trusted information available in the lead-up to July 1. It is crucial that communication efforts are coordinated to avoid misinformation. Funding is urgently needed to ensure the following:

- Provide short-term awareness-raising material to industry and contractors, alerting them to the short-term transition issues and processes.
- Provide clear messages and guidelines about what can and cannot be done.
- Develop frequently asked questions (FAQ) sheet for industry.
- Develop FAQ sheet for consumers.
- Let the Australian Refrigeration Council (ARC) use its database of licence holders to promulgate information urgently.
- Develop a communication strategy at all levels of the supply chain that is tailored, in some cases, to the role of the audiences and with a high degree of end-user involvement.
- Develop awareness-raising seminars/outreach programs for the consumer market – explain why prices are going up and provide examples to demonstrate why price rises further down the supply chain will be greater than merely the direct cost of the refrigerant CEP.
- A letter from the Australian Government that can be passed out to contractors' and wholesalers' clients, setting out the reasons for price increases so that the customers don't constantly question the bill.
- Develop industry awareness-raising material about low-GWP alternatives, barriers to these and timelines involved, in order to help manage appropriate end-user expectations.
- Develop and deliver technical seminars for contractors in all regions.



- Dissemination of communications and information should be through multiple industry bodies (e.g. ARC, AIRAH, AMCA, AREMA).

Industry participants are often unaware of information that is placed on websites. The HVAC&R industry also needs hard copy and other delivery methods to ensure the required information is accessible.

3.5. Regulation and enforcement solutions

A number of solutions were discussed in relation to the regulation and enforcement issues identified to ensure consumer protection and safety to contractors. Enforcement relates to the consequences for not complying with the requirements. Currently, the consequence of non-compliance is an increased cost to the user (via leakage). The consequence of non-compliance should be that an operator's licence is revoked and/or court action is taken.

The following regulatory and enforcement solutions were identified:

- Urgent extension of the existing licensing system to cover all refrigerants, including natural refrigerants, specifically for refrigerant handling, recovery, and recycling.
- End users need to be involved in developing the licensing requirements.
- Link licensing and enforcement with mandatory training of contractors and technicians.
- Grant the ARC regulatory powers and the ability to apply penalties for enforcement of the new licensing requirements.
- Provide more tightly enforced and regulated compliance monitoring.
- A regulatory framework must be in place for enforcement, particularly for leakage management and refrigerant recycling.
- Make an example out of those caught in black-market or criminal activities.
- Change the way codes and standards are written; have absolute terms and sanctions.
- Reduce the temptation associated with high price of refrigerants by visible policing and enforcement, and provision of appropriate training and information.

3.6. Training, education and trusted information solutions

A number of solutions relating to education, training and the development of trusted industry information were identified including:

- Use revenues raised by the refrigerant CEP to fund new training initiatives. Start new degree courses, bring new entrants into the industry, provide subsidies for taking on apprentices and pay support to keep them in school while working.
- Substantially increase the provision of industry education and training opportunities and materials, noting that in this industry it is difficult for people to take time off for training.
- Require training for handling of all refrigerants (not just ammonia or CO₂) based on national qualifications and units of competency.

- Engage the industry and focus on issues through a series of technical advisory videos, other online materials and mobile phone accessible advisories.
- Make annual professional development commitments mandatory to maintain licences and provide employee support to deliver training.
- Provide proper training and education for those who have no formal qualifications (for example, automotive air conditioner servicers).
- End-users must be involved in developing training requirements.
- Universities need to be included to address training for design engineers and refrigeration engineers.
- Develop a new Australian Standard for recycling of refrigerant gases, and radically shorten timeframes for completion of Australian Standards by providing funds and full-time personnel to drive committees and deliver outcomes.

3.7. End-user initiatives

Solutions were discussed in relation to end-user initiatives. It is important that end users are involved in the co-ordination process. They will ultimately be the primary beneficiaries of increased energy efficiency and reduced GHG emissions. The initiatives identified included:

- Users need to see the benefits of the refrigerant CEP in some manner, such as a comprehensive leak-reduction strategy paid for by the government or a capital subsidy to move to alternative low GWP (and zero ozone depletion) refrigerants.
- Provision of capital grants, incentive payments, and accelerated depreciation allowances for owners who pay for upgrades to replace existing plant with new high-efficiency and low-GWP refrigerant plant.
- Adopt the European approach to F-Gas regulations, in which the responsibility for refrigerants rests with the system owner. The responsibility can't be subcontracted to another entity. International Standard ISO 5149 was developed to align with the F-Gas regulations in Europe. The building owner is required to report on refrigerant losses, with an upper allowable limit of 3 per cent losses. If there are losses in excess of this for three consecutive years, a report is sent to the government and the F-gas enforcement department can impose penalties, including shutting a business down.
- Establish loss-minimisation programs that include mandatory reporting of losses – and the reasons for these – in a report that stays with the equipment. This data can then be entered onto an online database, accessed, audited and reviewed by inspectors, resulting in fines or penalties for repeat offenders.
- Online and mobile device guides to help owners reduce or eliminate refrigerant leakage (for example, the Real Zero program from the UK www.realzero.org.uk).

3.8. Other solutions

Other general solutions identified by summit participants included:

- Trials/research of new blends, systems and products need to be well managed, although accelerated.
- Rapidly build HVAC&R industry profile and develop a good understanding of the employment and economic role of the industry in the Australian economy. Use statistics and industry demographics to make the industry more visible and provide transparency to current behaviour.
- Encourage wholesalers to lift credit limits to allow for added cost to contractors.
- Provide extended finance for businesses in rural and regional areas to assist in the transition.
- Train regional contractors to allow informed exchange of old equipment for new equipment that has low-GWP refrigerants.

4. Workshop Session 3 – Obstacles

4.1. Introduction

Participants were asked to identify the obstacles and barriers to the solutions that were identified and discussed in workshop session two.

From an industry point of view, the primary obstacle is an apparent complete lack of interest in the HVAC&R industry from the Australian Government. This may be partly because the industry has no clear profile in Canberra and there exists no easily accessible clear statistical data on the size and reach of the industry. There is a lack of understanding of the industry taxonomy and the severe impact the refrigerant CEP will have.

Other industries will receive hundreds of millions of dollars in compensation as part of the legislative package. The HVAC&R industry has received no money to assist with the transition. The more vocal and well-organised and funded industry groups crowd out the HVAC&R industry. Apparently, fragmentation of the HVAC&R industry inhibits communication with the Australian Government.



Summit attendees – the obstacles.

4.2. Regulatory barriers

Regulation needs to be part of the solution. In some cases, however, regulations can act as a barrier to solutions. The following regulatory barriers were identified by summit attendees:

- The near-complete lack of co-ordination between industry and the policy-development arm of government has created systematic barriers resulting from lack of understanding in government and the wider economy of the HVAC&R industry. The HVAC&R industry is spread out over a range of other industries, which is why the refrigerant CEP has wider implications for the national economy than has been recognised.

- There is no evaluation framework for emissions reduction from this industry. An evaluation framework should always be provided as part of an evidence-based policy.
- There is insufficient articulation of specific policy objectives by the government with regard to this reform, thus providing no objectives against which results can be assessed.
- There has been insufficient assessment of the impacts of the carbon tax and refrigerant CEP on the HVAC&R industry by government. In the RIS regarding the introduction of the carbon tax there was approximately 500 words devoted to consideration of the impact on the market for refrigerant gases and the HVAC&R industry that relies entirely on these gases.
- There is no clear path for funding from the government. There are multiple funding programs associated with the Clean Energy Legislative Package but none actually appear to be fit for purpose for the HVAC&R industry.

4.3. Lack of access to trusted information

The industry needs a range of information to help with the transition to a low emission future. The following information barriers were identified by summit attendees:

- The information issues must be responded to immediately (not in 12 months).
- The least sophisticated segment of the industry (small contractors) may be delivering the message to the majority of end users.
- The reluctance of any one company to put branding on information ("shoot the messenger" syndrome).

4.4. Barriers to long-term industry solutions

The following barriers to developing solutions to the long-term chronic industry issues were identified by summit attendees:

- There is little or no enforcement of the synthetic greenhouse gas regulations that are already in place. The refrigerant CEP scheme must be backed up by an enforcement regime to maintain a level playing field for the industry.
- Slow process for the development of new regulations, standards and training resources. Even when it is of the highest priority, it would take at least two years to get new mandated licensing arrangements in place to cover new refrigerants.
- Significant shortage of refrigeration engineers who have experience in alternative or low-GWP refrigerant systems.
- Lack of preparation to respond to market demands for low-GWP alternatives, including misinformed clients.
- Lack of skilled trainers who can deliver the face-to-face elements of training required to deliver broad and timely up-skilling of the industry.
- Lack of training equipment at those few facilities that can offer a training course in alternative refrigerants. Lack of funding for those training providers to promote and deliver the courses they do provide.

- Lack of available/suitable/tested designs for use of natural refrigerants in many applications.
- Perception and reality of safety issues affection some natural refrigerants.
- Uncertain timelines for commercial availability of low-GWP HFCs and lack of certainty for pricing these alternatives.
- Government reluctance to favourably respond to calls for funding in the immediate future.

5. Workshop Session 4 – Questions and actions

5.1. Introduction

Participants were asked to identify the questions the industry urgently needs to answer, and essential actions that need to be taken in response to the carbon tax and refrigerant CEP.



Summit attendees – sharing intelligence.

5.2. Questions that need answering urgently

The following questions were identified as urgent:

- Of the (approximate minimum) \$300 million created by the refrigerant CEP per annum – plus the multiplier on GST throughout the value chains – what money can come back to industry to assist with the economic and technological transition, the changes to work practices, the risks to small businesses and employment losses?
- If there is no new initiative to return revenue generated by the refrigerant CEP to assist the industry in transition, then what funding can the industry access and who (in government) is in charge of it?
- Who has the right to recycle refrigerants?
- What are the standards for recycled refrigerants?
- How is recycled refrigerant verified?
- How will destruction of refrigerants be financed?

- How will the existing HCFC recovery and destruction program continue to function?
- Are there changed liabilities for businesses that choose to move to natural refrigerants? For instance if a club/pub moves to natural refrigerants, are there additional OHS/WHS issues, and is the equipment owner responsible for addressing these?
- What about HFC gases not listed on the IPCC 2 report?

5.3. Essential actions

The following actions were identified as essential to assist the industry in making this complex transition:

- Industry must approach the Australian Government and get support for prioritisation of the problem and to set up a co-ordinating group or body to drive responses, source funding for industry bodies and to advise government on how to respond to issues as they arise.
- Write an urgent communiqué to government outlining the issues, solutions and barriers associated with the transition of the industry to a low-emission future (AIRAH to draft, all others to endorse) and have it delivered to the government as soon as possible.
- Ensure that the issues receive Council of Australian Governments (COAG) and Australian Industry Group (AIG) recognition.
- Establish an industry/government forum, council or co-ordinating body to develop a framework through which all parties can collaboratively address the longer-term and chronic issues the industry is facing.
- Develop a list of legislation needs and priorities.
- Identify a list of priority projects seeking immediate funding.
- Identify who and what to target for funding for the various projects and go to them.
- Identify a list of longer-term projects that need urgent commitment and funding.
- Identify a list of actions to help ease the transition for the consumer and end user.
- Develop resources such as a “toolbox” and industry packs.
- Develop a fact sheet outlining the potential risks and dangers (for example, alternative refrigerants, theft, recycling, and misuse).
- Develop fact sheets demystifying blends, outlining what to do if illegal behaviour is witnessed and explaining the role of ARC.
- Use the ARBS exhibition in May to get the message out (information drop during ARBS; handouts, flyers, FAQ sheets). AIRAH to liaise with DSEWPac to facilitate.
- Obtain approval to use the ARC database for information dissemination and use wholesalers and industry associations.
- Instigate discussions with insurance companies regarding the sudden increase in the value of goods that need to be insured.



- Start licensing extension process with the government and ARC.
- Develop training materials and programs for short-term transition skills such as the identification of options and how to respond to customer demands.
- Create a website with information for all parts of the supply chain; ask and answer the following questions for users:
 - How much more will this cost me?
 - What are my options?
 - What are the risks, costs and benefits?
 - Seek feedback from the field on rorts, issues, questions.
- Apply Real Zero-type approach to minimise refrigerant leakage and start a Real Zero campaign.
- Develop an “Appropriate Equipment Application Guide” and update as new equipment emerges for various tasks.
- Develop an industry-wide position on responsibility for refrigeration gases in a system, in support of liability resting with the owner.

Seek funding for research programs to:

- Establish research needs and priorities including both direct and indirect emissions.
- Establish data collection at the Australian Bureau of Statistics on HVAC&R industry statistics.
- Collect information (in detail) about the installed base of equipment starting with large users and relate that data to other geographic information system (GIS) data.

6. Next steps

6.1. Introduction

After the workshop sessions, summit attendees considered the next steps.

6.2. Immediate actions

AIRAH will review all notes from the summit and compile a summit report and outcomes document. A copy will be circulated to all participants, with a view to having it signed off and released as a public record for the industry.

AIRAH will develop a communiqué to government outlining the serious concerns of the industry and proposing a number of urgent actions that are necessary to address and avoid unwanted impacts from the introduction of the Australian Government's Clean Energy Future legislative package. This will be circulated to all HVAC&R industry bodies for endorsement before submission.

AIRAH will seek funding to co-ordinate the development of a roadmap that details how the industry can transition to a low-emission future.

6.3. Close

AIRAH president Sean Treweek thanked all attendees for their participation in the 2012 AIRAH Industry Summit. It is a historic time in the industry and good to have so many stakeholders in a room together.

“The summit helped put industry stakeholders on the same page. Everyone knows what the problems are and now everyone knows what the solutions are,” Treweek said. “The industry needs to work out how to address the issues and barriers in a cohesive manner. AIRAH has committed to take action on the issue and take a leadership role in transitioning the HVAC&R industry to a low emissions future. It is hoped that all attendees will continue to be involved.”

The summit closed at 1pm.



Summit attendees.



APPENDIX A – LIST OF ATTENDEES WHO PARTICIPATED IN THE SUMMIT.

Name	Organisation	Acronym
Andrew Ambrose (AA)	A-Gas	
Sumit Oberoi (SO)	Air Conditioning and Mechanical Contractors Association	AMCA
Steve Anderson (SA)	Refrigerants Australia	RA
Thinh Tran (TT)	Plumbing Industry Commission	PIC
Glenn Evans (GE)	Australian Refrigeration Council	ARC
Doug Wyatt (DW)	WorkSafe Victoria	Worksafe Victoria
Andrew Ambrose (AA)	Refrigerants Australia	RA
Gabor Hilton (GH)	Refrigerated Warehouse and Transport Association	RWTA
Noel Munkman (NM)	EE-OZ – ElectroComms and Energy Utilities Industry Skills Council	EE-OZ
Kevin O'Shea (KO)	Refrigeration and Air Conditioning Contractors Association	RACCA
Shane Holt (SH)	Department of Climate Change and Energy Efficiency	DCCEE
Jason Lee (JL)	Department of Climate Change and Energy Efficiency	DCCEE
Harry Zevon (HZ)	Department of Climate Change and Energy Efficiency	DCCEE
John Mott (JM)	Gordons Refrigeration/AIRAH representative ME006 committee	
Katie Volter (KV)	Department of Sustainability, Environment, Water, Population and Communities	DSEWPaC
David Swanton (DS)	Department of Sustainability, Environment, Water, Population and Communities	DSEWPaC
Amanda Morley (AM)	Department of Sustainability, Environment, Water, Population and Communities	DSEWPaC
Kevin Lee (KL)	Heatcraft /Chair Standards Australia ME006 committee/ Air Conditioning and Refrigeration Equipment Manufacturer Association.	AREMA
Peter Brodribb (PB)	Expert group	
Tristram Travers (TT)	Enterprise Connect	EC
Tim Edwards (TE)	Australian Refrigeration Association	ARA
Manus Freeman (MF)	Chartered Institute of Building Services Engineers	CIBSE
Michael McCann (MMc)	Thinkwell	
Jonathan Fryer (JF)	AIRAH Natural refrigerant special technical group	AIRAH NR STG
Sean Treweek (SGT)	Australian Institute of Refrigeration Air Conditioning and Heating	AIRAH
Phil Wilkinson (PW)	Australian Institute of Refrigeration Air Conditioning and Heating	AIRAH
Heather White (HW)	Australian Institute of Refrigeration Air Conditioning and Heating	AIRAH
Carolyn Hughes (CPH)	Australian Institute of Refrigeration Air Conditioning and Heating	AIRAH

Rachel Urqhart (RU)	Australian Institute of Refrigeration Air Conditioning and Heating	AIRAH
Matt Dillon (MSD)	Australian Institute of Refrigeration Air Conditioning and Heating	AIRAH



APPENDIX B - ORGANISATIONS INVITED TO PARTICIPATE IN THE SURVEY

The following organisations and their membership were invited to participate in the survey.

Air Conditioning and Mechanical Contractors Association	AMCA
Air Conditioning and Refrigeration Manufacturers Association	AREMA
Plumbing Industry Commission	PIC
Australian Refrigeration Council	ARC
WorkSafe Victoria	Worksafe Victoria
Refrigerated Warehouse and Transport Association	RWTA
EE-OZ – ElectroComms and Energy Utilities Industry Skills Council	EE-OZ
Refrigeration and Air Conditioning Contractors Association	RACCA
Department of Climate Change and Energy Efficiency	DCCEE
Department of Sustainability, Environment, Water, Population and Communities	DSEWPaC
AIRAH Natural Refrigerant Special Technical Group	AIRAH NR STG
Department of Climate Change and Energy Efficiency	DCCEE
Australian Institute of Refrigeration Air Conditioning and Heating	AIRAH
Enterprise Connect	EC
Australian Refrigeration Association	ARA
Chartered Institute of Building Services Engineers	CIBSE
Australian Institute of Refrigeration Air Conditioning and Heating	AIRAH
