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### **AIRAH response to NSW Draft Climate Change Fund Strategic Plan and A Draft Plan to Save NSW Energy and Money**

On behalf of AIRAH and its Board congratulations on the leadership the NSW government is showing on tackling Climate Change and emissions abatement.

Following the signing of our memorandum of understanding with the NSW Office of Environment and Heritage, AIRAH look forward to working with the NSW government to address a number of issues critical to the productivity of Australia including our emissions reduction targets.

As Australia comes to grips with its national and international emission reduction commitments it is becoming clearer that the built environment including the refrigeration and air conditioning sector are critical point of focus, particularly for emission reductions. AIRAH recommend both indirect (energy use) and direct emissions (from refrigerant leakage) are considered together.

The Australian Institute of Refrigeration, Air Conditioning and Heating (AIRAH) is an industry-led organisation that represents the entire value chain, from tradespeople to university educated engineers, business leaders and leading researchers. This overarching perspective, and reach to 25,000+ industry participants, positions AIRAH to promote and develop the most efficient, productive and resilient industry for Australia's future.

AIRAH is keen to work with the Government to improve the environmental performance of existing and new HVAC&R systems. We envisage a collaborative effort to get and keep action firmly on the local, state and national agenda.

The HVAC&R sector is responsible for using 22% of all generated electricity, employs between 170,000 and 200,000 people and \$26.2 billion was spent on refrigeration and air conditioning services in Australia in 2012 alone.

Heating Ventilation and Air Conditioning (HVAC) typically make up 40-60% of a building's energy use, which has a direct and marked effect on Australia's national energy performance and emissions targets.

Improving building energy efficiency is a way for households, occupants, commercial building owners, and small businesses to reduce energy bills and improve productivity.



Reducing direct emissions from HVAC&R through better maintenance and improved system design and operation has a co-benefits of improving Energy efficiency, delivering a range of other benefits including increases in asset values, improvements in worker productivity, process productivity, occupant health benefits and importantly, improved building resilience, as buildings become less reliant on energy and HVAC&R.

AIRAH and the HVAC&R industry have recommendations and expertise that can generate tangible solutions for the future. We have already been an effective participant in this space.

AIRAH is in fact the driving force behind PRIME, the HVAC&R industry's blueprint for a successful transition to a low-emissions future through Professionalism, Regulation, Information, Measurement and Emission abatement.

## **AIRAHs recommendations on Sustainability and Energy productivity**

AIRAH is of the view that the HVAC&R industry has a significant role to play in addressing and improving the sustainability of the Australian building sector and the productivity of the wider economy.

### **Buildings**

AIRAH have collaborated with the Australian Sustainability Built Environment Council (ASBEC) on the development of the *Low Carbon, High Performance* report, which provides a roadmap for the transition of Australian property to a zero carbon footing.

Australia's commitment to the Paris Climate Change Agreement demands a transition to net zero emissions by 2050. The built environment presents the greatest opportunity to reduce emissions, at the least cost. Even without any new technology breakthroughs the ASBEC report shows that energy efficiency measures and fuel switching can reduce the projected 2050 emissions from buildings by more than half.

AIRAH recommends all governments and all industry stakeholders to commit to achieving net zero emissions buildings by implementing:

1. A **'Towards net zero' buildings plan** with supporting policy frameworks, governance arrangements, clear targets and ministerial responsibilities.
2. **Strong mandatory minimum standards** for new buildings, equipment and appliances with the long-term goal of net zero emissions. This includes better design integration through commissioning and validation testing but also strong minimum standards for the operation and maintenance of existing buildings and infrastructure.
3. **Targeted incentives and programs** to accelerate action, motivate and support higher performance, including incentives and the use of government market power.
4. **Energy market reforms** to ensure that the energy market supports roll-out of cost-effective energy efficiency and distributed energy improvements, including thermal energy storage and distribution
5. A range of **supporting data, information, training and education** measures to enable informed consumer choice, innovation, commercialisation and deployment of new technologies and business models.

## Mid-tier buildings

AIRAH is also working with a range of stakeholders to establish a plan of action for energy efficiency improvements in existing mid-tier buildings. The plan intends to accelerate improvements to mid-tier buildings and harness their emissions-reduction potential through the following activities:

6. **Supporting further research** to better understand the number, location, size and performance of mid-tier buildings.
7. Develop a **Building Retrofit Toolkit**, to bring together existing resources and tools and create new ones based on confirmed gaps and needs, together with an informed communications plan for building owners and their trusted advisers and service providers.
8. The **expansion of** initiatives such as the **Commercial Building Disclosure** program to apply to smaller buildings and other non-office building types.
9. Promote **innovative financing mechanisms** and Government incentives to encourage existing building upgrades and retrofits.

AIRAH is supporting a number of [National Energy Productivity Plan \(NEPP\) work plan](#) initiatives, in particular action 9b that relates to “*engagement with the HVAC&R industry and its industry-led low emissions future initiative*” (PRIME)

## AIRAH’s recommendations on HVAC&R sector sustainability

In addition to these property sector initiatives, AIRAH recommends the following actions to help promote and improve HVAC&R systems sustainability and productivity:

10. Continued improvement, promotion and uptake of the “**Calculating Cool**” building HVAC online rating tool, including an expansion of the tool to cover low-emission technologies.  
<http://www.calculatingcool.com.au/#/home>
11. The development of an emissions or efficiency **benchmarking tool for refrigeration** systems, similar to Calculating Cool but addressing industrial and commercial cold room and cool room refrigeration systems. There are software tools in existence overseas which could be modified or adapted for Australian use.
12. A renewed focus on the **maintenance and performance of existing buildings** (PRIME focus topic). Reducing direct and indirect emissions from HVAC&R means optimising life-time system performance and minimising life-time refrigerant leakage rates. This is only achievable through better maintenance and improved system operation which not only improves energy efficiency, but also delivers a range of other benefits, including increased asset values, improvements in worker productivity, process productivity, occupant health benefits, and importantly, improved building and infrastructure resilience.
13. More **research and training in HVAC&R** energy efficiency. Education and skills are critical if Australia is to have safe, sustainable, healthy and comfortable built environments and resilient efficient refrigeration infrastructure in a low-carbon economy. Research programs need to develop and disseminate information on low-emission HVAC&R strategies such as thermal storage, solar cooling, integrated phase change, integrated PV etc.
14. The development of climate zone specific **energy policies** requiring measurement, benchmarking and disclosure of energy use are essential to drive change. The absence of this data is a barrier to change. In particular, the expansion in scope and coverage of the Commercial Building Disclosure program to cover smaller buildings and all building sizes and types (classifications) would be a significant driver for change as would a similar benchmarking standard for refrigeration

applications such as cool rooms and refrigerated warehousing the widespread use of electrical resistance based heating in many applications needs to be addressed.

## AIRAHs recommendations on Climate Change adaptation/resilience

The HVAC&R industry and government need to develop a unified strategy for increasing the resilience of HVAC&R, resulting in more resilient buildings and cities, more resilient cold chain and food supplies, and more resilient technical infrastructure in health, processing, education and information technology. AIRAH recommend the following activities in relation to HVAC&R resilience:

15. Development and documentation of the types of **actions and solutions** that can improve building and HVAC&R resilience.
16. Collaboration and development of a clear and agreed **framework to address resilience** issues across the entire HVAC&R supply chain (including during design, installation, operation and maintenance activities) so that clients, procurement agencies and technical service providers alike can all address resilience in a unified and collaborative manner.
17. More research is needed, particularly into the magnitude of impacts and change in **future climate design data** over the typical 10 to 20 year 'useful life' of an HVAC&R system. Future TMY (future typical meteorological year) data is needed to help industry predict future climate design standards and data.
18. **Education and awareness raising** around the challenges in HVAC&R resilience, and what is possible to address these, should be developed for related stakeholders. Providing the right people with the right information on HVAC&R resilience is a key component of addressing any weak links.
19. **Government policy and support** is also needed to ensure that resilience is considered in all new infrastructure. Industry cannot achieve this alone and a strong federal, state and local governmental policy platform around resilience, which includes strong minimum standards as well as incentives for best practice and support for training and professionalism, are also clearly needed.

## Refrigerant Transition and PRIME (direct emissions)

Australia and the other parties to the Montreal Protocol reached an agreement to a global 85 per cent phase-down of hydrofluorocarbons (HFCs) by 2050, during a series of talks in Kigali, Rwanda in October 2016. Australia has committed to an 85% phase down of HFCs by 2036.

One of the biggest changes and challenges facing the refrigeration and air conditioning industry is the move from high global warming potential (GWP) refrigerant technology to low GWP refrigerants and associated technologies. Refrigeration and air conditioning provide many benefits to society, but these benefits carry environmental and societal consequences. In order to mitigate these consequences, the industry is moving towards greater use of low GWP refrigerants.

Many low GWP refrigerants are flammable, some are toxic and some operate at very high pressures. These characteristics, combined with a lack of industry familiarity and training, present a series of safety challenges for the industry, and society as a whole. Most of the refrigerants that licensed technicians have been trained on will be replaced in the near future, resulting in a significant technical re-training requirement for all practitioners in the field.

Choosing a refrigerant has also become more complex. Contemporary low GWP refrigerants include natural refrigerants, synthetic refrigerants and blends of refrigerants.

Synthetic low GWP refrigerants include single species and blends of HFCs and HFOs. Natural low GWP refrigerants include ammonia, carbon dioxide, hydrocarbons, water, and air. Some low GWP natural refrigerants have been used in the Australian market in specific applications for many decades. Although more environmentally favourable, low GWP refrigerants are not free of the traditional refrigerant safety concerns which include flammability, toxicity, high pressures, or simple asphyxiation.

### **AIRAH position on refrigerant transition**

AIRAH supports a move to low-emission (direct and indirect emissions) high efficiency HVAC&R, which includes an industry transition to low GWP refrigerants.

AIRAH's position is that the selection of refrigerants and the type of technology for any particular application should be based on a holistic analysis of multiple criteria. AIRAH promotes the safe and responsible use of refrigerants and supports the efforts to advance technologies that minimise impact on the environment while enhancing performance, cost effectiveness, and safety.

AIRAH is technology neutral in its support of all low GWP refrigerant technologies.

The transition to low GWP refrigerant technology is a reality and this means:

- Low GWP refrigerants bringing new training challenges for the industry technical service providers.
- High GWP refrigerant based systems, that are still being designed and installed will have a defined limited lifetime. Clients and procurement departments need to be aware of the implications of procurement decisions and available alternatives.
- Increased demands for energy efficiency within HVAC&R means that refrigerant system efficiency and refrigeration component efficiency (compressors, coils, fans) will need to continue to improve.
- Increased demands for greater energy productivity from HVAC&R infrastructure, means that controls, technology, and energy efficiency maintenance all need to be addressed as do operator awareness and behaviours.

### **AIRAH recommendations on refrigerant transition**

The transition in refrigerant technologies towards a low-emission refrigeration and air conditioning industry is the biggest single challenge facing the HVAC&R industry. AIRAH make the following recommendations to help facilitate a smoother and accelerated refrigerant transition:

20. **Information initiatives to support the HFC phase-down** – There are a range of stakeholders that will require significant awareness raising around the HFC phase down and what that means for long term procurement of new systems and for the ongoing maintenance of existing systems. Governments should actively engage with representatives of the HVAC&R industry at local, state and commonwealth level, to work together to develop constructive ideas for ensuring the transition to low GWP systems is made as smoothly as the industry transitioned from CFC to HFC refrigerants.
21. **Training and education** – A significant focus for AIRAH is the 20,000 VET-trained technicians who design, install, maintain, repair, and decommission refrigeration and air conditioning plant and components every day. The switch in refrigerant technology to low-GWP alternatives, through the HFC phase-down, demands new knowledge and skills to operate safely. The development and delivery of TAFE/VET training units that cover the safe and efficient application of low-GWP



refrigerants including HFCs, HFOs, hydrocarbons, Ammonia and CO<sub>2</sub> is essential. Workforce development planning should include a scheme to make individual units available to existing licence holders at a significant discount. Digitise training for skills maintenance purposes and provide face to face and alternative delivery platforms for those that need it.

The HVAC&R industry is facing an upcoming skills crisis due to the low level of enrolments in vocational education training and apprenticeships and a lack of targeted university degree courses for building services or refrigeration engineers. The industry needs to lift its profile and attract high quality passionate students. A skills based licensing system is a key enabler to creating a demand for more education and pride in qualifications achieved. The industry needs a more dynamic TAFE/VET system with industry at its centre, government apprenticeship incentives and the development and introduction of graduate courses specifically for HVAC&R.

22. **National licencing and registration** – Australia needs a single skills based national licencing system for refrigeration technicians that covers the application of all refrigerants in all sectors and every jurisdiction. Skills maintenance and continued development is essential. Business and trade practice licencing is a separate issue. A nationally harmonised state-based registration system for building services and refrigeration engineers is also highly desirable to professionalise the building services and refrigeration industry.
23. **Updates of industry Codes of Practice and guides** – The industry will require new information and design tools to help inform their technical decisions. Important industry documents such as the AIRAH Refrigerant Selection Guide need to be updated in content and modernised in format to support the industry transition. Following the *Ozone Protection and Synthetic Greenhouse Gas Management Act* review and the widespread introduction of flammable synthetic refrigerants into the Australian market, the existing [Refrigerant Handling Code of Practice](#) documents (parts 1 and 2) should be updated to reflect all changes and examine the potential for additional leakage stringency increases.
24. **A focus on flammable refrigerants** – As the industry transitions to low-GWP refrigerants, all stakeholders will encounter flammable refrigerants more frequently. There are a whole range of stakeholders, all along the refrigeration and air conditioning supply chain, that will need to adopt new practices and procedures to accommodate the flammability risk, and who are not currently aware of these changes. This topic is identified as a PRIME focus area.
25. **More HVAC&R research** – Is needed into low GWP refrigerants, new safety procedures, and new next generation low-emission cooling and heating technologies. The development of a HVAC&R Research Roadmap should be the first step. In addition, options to link the performance of systems to operational outcomes should be explored including real time energy management and automated fault detection and diagnostics.

AIRAH has a long successful history of working with local, state and national governments on critical issues to the environment, safety and comfort and we welcome the opportunity to collaborate with the NSW government on its Climate Change policies and implementation activities.

Should you require any further information please do not hesitate to contact me on 03 8623 3000 or [tony@airah.org.au](mailto:tony@airah.org.au)

Yours sincerely,

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Encl AIRAH Policy and Advocacy Positions 2017-2020