Submission to the Climate Change Authority
February 2016

Purpose

This submission describes various approaches to mitigate greenhouse gas emissions from HFCs, and identifies a set of policy approaches that deliver the most abatement in a cost effective way.

Background on HFCs

HFCs are manmade substances. They are used for a variety of purposes including as refrigerants, as foam blowing agents, and in aerosols (particularly asthma puffers). In terms of tonnage of HFCs used globally, refrigerants are the main use. In these uses they have replaced ozone depleting substances.

HFCs are also potent greenhouse gases when emitted into the atmosphere, with global warming potentials (GWP) ranging from several thousand to the low hundreds depending on the gas. High GWP HFCs are increasingly being replaced by other HFCs with lower GWPs, by HFOs and by alternative refrigerants such as carbon dioxide, ammonia and hydrocarbons, which have even lower GWPs.

As HFCs have both a high global warming potential and a comparatively short atmospheric lifespan they have been identified as one group of greenhouse gases where quick action can have nearly immediate benefits for the climate. Current international moves to formalize a global phase down have been underway in the Montreal Protocol forums for a number of years and have broad support across governments and industry.

Managing HFC emissions, however, is problematic and presents a range of challenges. In refrigeration and air conditioning equipment – where the majority of applications are found – their use is not emissive. HFCs are the working fluids that allow the refrigerant cycle to transfer heat – leaks and other losses of HFCs are not necessary for the installation, operation or disposal of the equipment. Refrigerants are manufactured for a purpose, and their emission can largely be prevented. The difficulty is, therefore, that emissions are largely accidents – from leaky pipes, old equipment and poor handling - and are unplanned.

Part of the challenge for preventing HFC emissions is that they are not from large point sources – like smokestacks. They come from a broad range of a diverse suite of equipment used for a wide variety of applications across the economy. In greenhouse gas policy terms, controlling emissions from HFCs is similar to both transport and agriculture, rather than power generation and emissions from manufacturing facilities.

Various approaches for mitigating HFCs

There are two broad approaches for mitigating HFC emissions. There are upstream measures that attempt to control a market's capacity to access HFCs through controls on supply. They are also downstream measures that impact on the handling and application of these gases across a wide-range of industry sectors.

Downstream measures

Since 2004, Australia has had a national comprehensive approach to managing downstream emissions, as is the case in virtually every developed country. As was demonstrated in the recent release of papers as part of the review of the Ozone Protection and Synthetic Greenhouse Gas Management Act (2004), these measures have delivered substantial emissions savings in a manner that derives benefits for the community and industry. The review of this legislation offers sensible opportunities to extend downstream measures.

Downstream measures typically include:

1. Containment and licensing – These are measures designed to ensure high standards for servicing and maintenance. They typically cover minimum requirements for leak checking for large equipment, blanket bans on preventable emissions and minimum training and licensing requirements for service personal. In some jurisdictions, HFCs can only by bought, sold or handled by people with requisite skills and a license.
2. Product stewardship – Measures focused on product stewardship are designed to provide an impetus – whether it is an incentive or penalty avoidance – for used HFCs to be recovered at the end of their life. At this point, depending on the program and the quality of the used gas, they can be either reused or destroyed.
3. Product bans – These are government regulation specifying where these substances may not be used. They are typically used by Governments to ensure a transition to substances with lower GWPs where alternatives already exist, are commercially proven and are safely used in the marketplace already or to lower emission technologies. The best example of these measures in Australia is the ban on disposable cylinders which inevitably result in loss of control of refrigerant through the supply chain, access to refrigerant by untrained individuals, and inevitable emissions from the refrigerant remaining in the "heel" of the cylinder which cannot be removed.

Refrigerants Australia urges the Climate Change Authority to recommend the continued development of measures that directly reduce the emissions of HFC refrigerants as described above.

Upstream measures

The other means Governments have used to attempt to control emissions is by influencing the market's ability to acquire HFCs on the basis that if HFCs are scarce, emissions will be reduced. The two broad measures in this basket of approaches include those measures that mean to limit the quantity of HFCs put on the market and others that look to directly impact on their cost. There is strong agreement among industry and most governments globally that the use of both types of controls simultaneously has inherent inefficiencies and would involve unnecessary costs to both the industry and the economy more generally without driving significant further abatement.

1. Cost Measures

   Governments have used a variety of means with the effect of raising HFC costs to an extent that depresses demand and creates incentives for the development and deployment of alternative products and approaches. This is a standard economic approach, which has been used across a wide-spectrum of economic activity to respond a wide variety of policy issues. Significant international examples of the use of increased cost to reduce HFC emissions include the Norwegian tax on supply of HFCs, the abortive Australian Emissions Trading Scheme, and the recently announced tax in Spain on HFCs used in servicing.

2. Supply Measures

   These are measures that are designed simply to restrict supply, forcing use of HFCs into higher order goods. Typically, attempts to control supply of HFCs are based not on their weight, but rather their impact on the climate. The rationale for this approach is to encourage transition to lower GWP gases and alternatives where available, but having the market retain the option to assess and decide what solutions meet its needs best. The clearest examples of HFC phasedowns are the proposals in the Montreal Protocol to take this action globally, and the development of a new suite of F-Gas regulations by the EU that will see the amount of HFCs entering the marketplace in Europe decline by 79% by 2035.

Exploring Cost Measures

The use of costs as a means to drive abatement does not provide policy makers with certainty of emissions reduction. Quite simply the market can decide to pay the costs and purchase whatever refrigerant it wants regardless of its environmental characteristics and emissions risk.

Additionally, part of the rational for using cost measures – particularly emissions trading – is that by raising the operational costs for emissive (inefficient) equipment investors decide to purchase more efficient equipment that while it may have a higher capital cost, these costs are recouped over time through greater efficiency. This belief does not universally transcend the gap from the classroom to the boardroom. Operational costs, such as electricity prices, are

often uncertain, paid for by other entities or simply overlooked in decision-making. As a result of this policy failure governments across Australia and globally have implemented a range of energy efficiency programs to support rational decision-making that drives lower emissions.

This understanding is more tenuous when it comes to refrigerants. Firstly, refrigerants are a minor cost of new equipment. More vitally, refrigerants are used only when needed on an ad hoc basis following a leak or other maintenance issue at some point in the future. It is difficult for a decision-maker looking to buy equipment today to consider what a cost might be in 10 or 15 years in the event that his equipment requires more refrigerant. Simply put, a price signal on refrigerant is muffled at best and does not guarantee emission reductions.

There are also some particular issues with emissions trading and refrigerants. Emission trading schemes are designed and intended for pollution – stack and tailpipe emissions. Refrigerants are manufactured for a purpose, and their emission can be prevented. Charging a carbon price on refrigerants prior to installation, use, and emissions is akin to charging a carbon price on coal that may stay in the ground.

Lastly, industry in Australia and other countries where cost measures were used observed a number of unexpected and negative consequences including:

- There were many examples of equipment owners keeping equipment in service with low charges and delaying equipment retrofit activities because of refrigerant cost. These activities lead to both higher power consumption (resulting in higher indirect emissions) and made equipment more prone to failure, which increased costs and led to increase probability of catastrophic loss of refrigerants.
- Higher prices of HFCs saw extension of the use of R22, an ODS, which was not subject to the carbon price.
- The higher price for refrigerants induced elevated levels of reuse by owners and service personnel, but without increase in reclamation. It seems highly likely that significant volumes of impure recovered refrigerant were installed into other systems. The use of poor quality refrigerant led directly to higher power consumption with increased direct emissions, increased breakdowns, higher maintenance costs, and increased leakage resulting in higher direct emissions over time.

Exploring Supply Measures

Industry and governments equally recognize the value of a phasedown: which is a mechanism to gradually reduce the amount of HFCs in an economy on a carbon dioxide equivalent basis. This approach was used successfully to phase down ozone depleting substances (precursors to HFCs) through the Montreal Protocol and in domestic measures in Australia and globally. This approach has proved highly successful – ozone depleting substances are being withdrawn from use globally, the ozone layer is recovering and the Montreal Protocol is widely considered the most effective international environment treaty ever agreed.

It is for the reasons that the international community is currently negotiating a phase-down of HFCs through the Montreal Protocol. There is confidence that the process works and can be replicated. Additionally, the Australian Government in reviewing its own *Ozone Protection and Synthetic Greenhouse Management Act* (2004) found that an HFC phase down was an effective measure for cost-effectively delivering emissions abatement for the Australian community. These finding were endorsed by an industry technical working group that reviewed all of the assessments.

The benefits of a phasedown are simple and clear. To policy makers a phase down provides certainty of emission reductions. If the gas does not enter the economy then it simply cannot be emitted. Industry prefers phasedown because there is certainty as to what the rules and market will be like going forward. This certainty enables investment decisions to be made with confidence.

Government has indicated that it would look to implement a phasedown of 85% by 2036. This position is fully supported by industry. Action of this scale – a reduction of emissions of almost an order of magnitude in two decades – is a clear win for the environment.

Recommendation

Refrigerants Australia recommends to the Climate Change Authority that the preferred policy position is for a predictable phase-down over a reasonable period, coupled with strong end use measures to reduce emissions. This approach provides an effective, cost-effective and efficient means to reduce emissions dramatically over a comparatively time.