

## The Australian Experiment In Fluorocarbon Refrigerant Management and Reduction

### ABSTRACT

15042013

The Australian Government established a tax on GHG emissions in July 2012 – the carbon tax and the Clean Energy Future legislative package. Part of the package of legislation was a levy on the importation of synthetic greenhouse gases including fluorocarbon refrigerants covered by the Kyoto protocol – HFCs (the SGG Levy also known as the HFC Levy). This legislative instrument was introduced within the existing Ozone Protection & Synthetic Greenhouse Gases Management Act 1989. The levy does not apply to Montreal Protocol refrigerants (CFCs, HCFCs). CFCs are banned and HCFCs are being rapidly phased out under prior legislation. This paper describes the nature and impact of the HFC Levy.

We entitle the paper the Australian Experiment in so far as Australia is one of a small number of countries that have elected to apply a tax on fluorocarbon refrigerants (Norway and Denmark have similar treatments). The impact of the levy is described with a view to guiding other authorities in the consideration of a pricing mechanism for discouraging HFC refrigerant use.

### Context

The HVACR industry in Australia is highly developed. There are in excess of 40M individual HVACR installations for a population of 23M spanning the full range of applications one would expect in an industrialised country. In 2007 the federal government published a report on the demographics of the industry wherein it was reported that the industry contributed about 2% of GDP, 22% of electricity consumption, and directly employed about 200,000 people in about 20,000 firms. Other studies of Australia's GHG emissions indicate that HVACR was, in 2006, responsible for about 8% of the country's GHG emissions (7% indirect and 1% direct). We consider refrigerant emissions to be closer to 3% of national emissions reflecting variance in the methodology used to calculate the national inventory. This information is currently being updated under the title "Cold Hard Facts 2"<sup>1</sup>.

Australia is a signatory to the Montreal and Kyoto protocols. The current Labour government has sought to show leadership in both regards by accelerating the phase out of ozone depleting refrigerants and by enacting the SGG Levy. It has been illegal since 1995 to knowingly emit fluorocarbon refrigerants however, despite extensive government auditing of HVACR industry practices no one has ever been prosecuted under this law. Fluorocarbon refrigerant leakage and CO<sub>2</sub> emissions are considered unnecessarily high.

Australia has also claimed leadership in SGG refrigerant recovery and destruction by way of Refrigerant Reclaim Australia (RRA), a government endorsed voluntary industry organisation that claims but fails to deliver a high degree of Fluorocarbon refrigerant recovery. RRA has been in place since 1993. It operates a scheme where by recovered refrigerants receive payment for delivery to RRA (funded by an industry levy on refrigerant imports) for destruction via a plasma arc furnace in Melbourne. The premise of RRA is that there are refrigerants that warrant disposal being end of life management of refrigerants. RRA proposes that it is a product steward for the HVACR industry but it is only a product steward for refrigerants, and even this description is a narrow use of the meaning of product stewardship – only end of life management.

It is important to recognise that the HVACR industry does not have a high degree of coordination or visibility in Australia. There are a large number of representative bodies that tend to serve their particular sector. There has not, historically, been a high degree of coordination between the industry and government with the exceptions noted above.

---

<sup>1</sup> Cold Hard Facts 1 is available at <http://www.environment.gov.au/atmosphere/ozone/sgg>

## The Purpose of the HFC Levy

The government describes the purpose of the levy as follows:

“Applying an equivalent carbon price to synthetic greenhouse gases will create a financial incentive to reduce emissions by placing a price tag on every tonne of synthetic greenhouse gases. It will encourage Australian consumers to consider purchasing products containing alternative gases and to take measures to reduce leakage of gas from equipment. It also provides an incentive for industry to use alternative gases and to improve recycling rates for these (HFC) gases”.

So the point of the levy was and is:

1. To encourage the use of natural refrigerant based technologies and low GWP fluorocarbon refrigerants by making high GWP refrigerants relatively more expensive.
2. To reduce HFC leakage by making leakage expensive
3. To increase HFC refrigerant recycling by increasing the value of recycled refrigerants

The last objective being somewhat illogical in the context of high leakage rates but hypothetically consistent.

A range of fact sheets and information on the HFC levy administration are available at:

1. Clean Energy Future website: <http://www.cleanenergyfuture.gov.au/clean-energy-future/our-plan/>
2. The government's administration of synthetic greenhouse gases visit: <http://www.environment.gov.au/atmosphere/ozone/ssg>

## Price Impact of the HFC Levy

Equivalent carbon price commenced with a three year fixed price period:

- \$23.00 in 2012-13
- \$24.15 in 2013-14
- \$25.40 in 2014-15

After 1 July 2015, the carbon price will be the benchmark average auction charge for GHG emissions.

As result HFC prices increased quite dramatically from July 2012. R134a having a GWP of 1410 generates a levy in 2012/13 in the amount of  $1.41 \times \$23.00 = \$32.34 / \text{KG}$ .

<b>The Carbon Price Equivalent Tax on HFC Refrigerants</b>				
<b>HFC</b>	<b>GWP</b>	<b>Levy / KG 2012/13</b>	<b>Levy /KG 2013/14</b>	<b>Levy / KG 2014/15</b>
<b>R134a</b>	1410	\$32.43	\$34.05	\$35.81
<b>R404a</b>	3862	\$88.83	\$93.27	\$98.09
<b>R410a</b>	2060	\$47.25	\$49.75	\$52.23

The cost of the levy is passed through the refrigerant supply chain with the resulting margins being added to the wholesale price. The impact on HFC refrigerant prices has been to increase HFC retail prices by 200/400% depending on the species GWP, refrigerant supply price and degree of margins added through the supply chain. HCFC prices have increased in parallel due to supply reduction.

The volume of funds that were anticipated to be collected were and are in the order of \$200 / 300M PA. Whilst this is a small amount in the context of the carbon tax, which is about \$5B PA, it is nonetheless a large amount, and an entirely incremental cost for the industry. The government put in place a few programs to spend the HFC levy revenue back into the HVACR industry to facilitate the objectives of the levy however the magnitude of this spending has not been correlated to the amounts collected and is considered a small proportion.

The levy was intended to have significant impact on the HVACR industry from refrigerant suppliers through the entire supply chain and ultimately to consumers. Our view is that the levy was and is a fundamentally valid policy that should cause reduced fluorocarbon refrigerant emissions and increased use of more energy efficient natural refrigerants. However the introduction of the levy was not as clearly communicated as it might have been and the HVACR industry resistance has been strenuous. Importantly the government has not been forthright in supporting and facilitating the adoption of natural refrigerant-based technologies (unlike governments in other industrialised countries who have done so) reflecting at least a significantly constrained view that natural refrigerant based technologies introduce safety risks that the government does not want to held responsible for and perhaps a degree of alignment with fluorocarbon suppliers that contradicts the intent of the HFC levy.

### **Introduction of the HFC Levy**

The introduction of the levy was far from smooth from a political and effectiveness point of view.

The industry was not well consulted in the consideration of the levy. Whilst there was a considerable time period between the levy being announced and applied both the industry and government failed to cause the industry at large to be aware that the levy would be applied or the implications of the levy. The implications are by definition significant for the industry but neither the industry nor the government made this clear until two months before the levy was applied.

Neither the government nor industry was well prepared for the introduction of the levy. When it became clear that the levy would in fact be applied there was considerable objection. Many risks were cited by those objecting to the levy including the risk of economic harm, business failure due to catastrophic leaks, insurance default and theft. None of these eventuated to a significant degree.

Large, well-informed users of fluorocarbon refrigerants, of course, stock piled refrigerant prior to the levy being applied. At the same time refrigerant importers announced price increases shortly after the start of the levy, which were presented as recommended retail prices, typically far in excess of the prices justified by the levy.

The fundamental logic of the levy was never explained and even to this date is not broadly understood. That logic being two fold:

1. Fluorocarbon refrigerants are rampantly leaked in Australia due to the lack of enforcement of the prohibition of intentional emissions and the interpretation that known continuous endemic leakage is not intentional.
2. The alternative natural refrigerants are more energy efficient and therefore give rise to lower indirect emissions.

The failure of the government and industry to embrace these principles has caused the HFC levy to be characterised as being primarily a tax revenue raising opportunity rather than a bonafide environmental policy.

There remains a great deal of work to do to cause the HFC levy to be effectively implemented. A well-considered implementation would have included:

1. A major communications program to explain the logic and impact of the levy.
2. A major training program for all stakeholders including contractors and end users as to the implications of the levy.
3. Facilitation of natural refrigerant based technology commercialisation.
4. Resolution of HVACR standards and licensing requirements across the full range of HVACR applications
5. New licensing provisions for recovery, recycling and/or destruction of refrigerants. Most importantly a way for those that pay the HFC levy to recover its cost by recovering and destroying HFC refrigerants. The policy in this regard is in development.

Because none of this preparatory work was done and because the industry hoped the levy would not arise, its implementation has not been effective.

It is also our view that the separation of the government administration of the HFC levy from the department responsible for the main body of the Clean Energy Future legislation has led to an ongoing disconnect between the intent of the policy and its implementation. The Clean Energy Future Legislation was principally the responsibility of the Department of Climate Change and Energy Efficiency whilst the HFC levy and the OPSGG MA are the responsibility of the Department of Sustainability, Environment Water, Population and Communities (DSEWPC). The lack of transparency from DSEWPC is an ongoing source of poor policy development by the department and by government.

### **Current Situation**

Despite the implementation failure the industry is adjusting and addressing the opportunity that is the commercial reality of the HVACR industry in Australia:

1. Energy prices in the last three years have increased significantly (about 100%) for a number of reasons including the carbon tax but almost entirely unrelated to the carbon tax. About 90% of the price increase has been attributable to factors other than the carbon tax.
2. The HFC levy has increased HFC retail prices by 300% on average.
3. There continues to be a reasonable degree of public and corporate support for climate change mitigation including fluorocarbon refrigerant emissions reduction.

As a result there is a strong demand for energy efficient HVACR technology and increasing demand for engineers and contractors skilled in the use of natural refrigerant based technologies.

At the same time the popularity of the current government is in steep decline with an election called for September 2013. The public view is that the current government will be replaced by a Liberal / Nationals Coalition that has pledged to remove both the carbon tax and the SGG Levy.

As a result the HVACR industry is reticent to act on the current commercial incentives to adopt natural refrigerant-based technologies and is hoping that the commercial environment will change significantly. We consider this highly unlikely because energy prices will certainly remain high and the fluorocarbon suppliers are likely to maintain premium refrigerant prices.

Despite the current government's intentions to cause the HFC levy to be effective it is far from clear that much further policy development will be done to improve its acceptance given the political pressure on the current government.

It is too early to make a considered assessment of the impact and effectiveness of HFC levy. The short term political situation is certainly a major detractor; however, the ongoing ineffectiveness of the HFC levy implementation and the lack of supporting policy has been the primary source of limited effectiveness.

Nonetheless it is also clear that the HFC levy has caused a high degree of attention to be paid to the need for the industry to consider natural refrigerant based technologies and reduce fluorocarbon refrigerant leakage. We believe this increased awareness of the potential for natural refrigerant based technologies to reduce HVACR operating costs will continue to deliver support for these technologies and transition from fluorocarbon based technologies. We are aware of a large number of early stage projects to increase the availability of natural refrigerant-based technologies. We expect to see rapid progress in this regard in view of the high demand for cost savings in HVACR operations.

A significant example of this shift is the work being done by the industry with the leadership of AIRAH (the Australian Institute of Refrigeration Air Conditioning and Heating) to call an industry summit prior to the HFC levy being introduced and a further summit planned for late March 2013. In preparation for the 2013 summit AIRAH has conducted an extensive industry consultation program aimed at resolving a strategy for "Transition to Low Emissions". This summit is likely to achieve the following:

1. Cause AIRAH and the many industry peak bodies and stakeholders including government and end users to recognise that the industry has a responsibility and opportunity to reduce emissions.
2. Cause greater collaboration within the industry, with its stakeholders and with government.
3. Providing the industry with a comprehensive list to the possible strategies for transition and maybe even the priorities.
4. Inhibit the possible new government from undermining the potential for transition.

## **Lessons Learned**

The following list of lessons learned must be considered in the Australian context. It is not possible to be prescriptive as to the relevance of these lessons to other countries without appreciating HVACR industry structural and cultural differences.

1. The basic principle of putting a price on refrigerants at point of importation has merit in so far as the GHG emissions risk and cost is recognised at source.
2. However it is critical for the rationale underpinning this tax to be recognised, particularly the high rate of fluorocarbon refrigerant leakage and the potential for emissions reduction available from natural refrigerants. A fundamental requirement is solid evidence of the extent of fluorocarbon refrigerant leakage by HVACR sector and the commercial opportunity for increased energy efficiency.
3. Recognition of the discrepancies that arise between the Montreal and Kyoto protocol and the impact of these on the design and implementation of the tax.
4. The need for broad industry consultation incorporating a thorough, evidence based assessment of the need and opportunity for HVACR emissions reduction and the commercial benefits. This consultation needs to reach deep into the HVACR industry contractors and users and be conducted with sufficient lead times to enable the industry to prepare for change.
5. Enforcement of legislation that prohibits the intentional release of fluorocarbon refrigerants.
6. Centralised government leadership such that there is a high degree of consistency across the range of GHG emissions abatement policies. It must be understood that the vast majority of the HVACR industry being fluorocarbon refrigerant based will object to a tax on fluorocarbon refrigerants and will resist its implementation unless government leadership is strong.

7. A thorough and well developed implementation program incorporating the following considerations. The government must take responsibility for this program and must not expect the HVACR industry to support the tax without a great deal of planning and policy development that enables the tax to be effectively implemented.
8. Direct recognition of the cost to the industry and its stakeholders of the tax and a considered program to spend back a significant portion of the tax revenue to facilitate change.
9. A significant treatment of HVACR standards and codes of practice such that environmental safety is put on at least equal footing with operating safety and fully incorporated in the process of transition.
10. A major communications program funded by government to explain the basis for the tax and the required industry reaction. It is important to reach the front line of the HVACR industry with this communication.
11. A major training program that reaches HVACR contractors and end users so as to enable them to embrace the new policy and the skills requirements associated with the adoption of new technology and new standards.

For more information contact:

Tim Edwards  
Phone: 02 48615355

email: [tim.edwards@ausref.org.au](mailto:tim.edwards@ausref.org.au)  
Mobile: 0405 324 834