



Australia's approach to disposal and destruction of ozone depleting substances

Submission to the Ozone Secretariat in line with Decision XX/7

Summary

Australia has developed a robust and functioning product stewardship programme for the management of ozone depleting substances and synthetic greenhouse gases, which ensures the proper handling of these substances from their import into Australia through to their eventual disposal and destruction. It functions on the “polluter pays” principle, with industry funding the scheme through a levy imposed on imports of bulk gases and gas contained in refrigeration and air-conditioning equipment. Fees from issuing licences also assist the Australian Government in administering the various licence schemes connected to the consumption of ozone depleting substances and synthetic greenhouse gases. In recent decades, the Australian Government has been implementing a highly effective national strategy for the recovery, management and disposal of halons.

Introduction

Australia has been Party to the Vienna Convention for the Protection of the Ozone Layer and Montreal Protocol on Substances that Deplete the Ozone Layer since their inception in the 1980's, and has consistently met or exceeded its obligations to phase-out the production and consumption of ozone depleting substances.

Australia meets its obligations through implementation of the *Ozone Protection and Synthetic Greenhouse Gas Management Act 1989*, which is administered by the Ozone and Synthetic Gas Team of the Department of the Environment, Water, Heritage and the Arts.

This Act and its associated regulations allow Australia to meet its obligations through imposing controls on the manufacture, import and export of ozone depleting substances (ODS) in bulk and in product form. It also has established a faster reduction in Australia's consumption of ODS than required, allows Australia to meet its reporting obligations for synthetic greenhouse gases (SGGs) under the United Nations Framework Convention on Climate Change and sets in place controls to minimise impacts of ODS and SGGs on the atmosphere.

The approach of the Australian Government to the recovery and destruction of ODS and SGGs may change over the coming years with the introduction of the Carbon

Pollution Reduction Scheme (CPRS), a market-based mechanism for reducing the emissions of greenhouse gases covered under the Kyoto Protocol (including HFCs, PFCs and SF₆).

Product Stewardship requirements for the refrigeration and air-conditioning sector

All imports of ODS and SGGs into Australia must be licensed, including those contained in refrigeration and air conditioning equipment. One of the conditions of an import licence requires importers to manage ODS and SGGs at the end of their life and to be a member of an approved product stewardship scheme. At this time, there is only one approved product stewardship scheme, Refrigerant Reclaim Australia (RRA). This scheme was established in 1993 to recover waste ODS and is operated primarily by the refrigeration and air-conditioning industry, which consumes over 90% of all ODS and SGGs imported into Australia. The RRA program was expanded in 2003 to include SGGs and the gas incorporated in refrigeration and air-conditioning equipment, to avoid market distortions and to ensure consistent treatment of all fluorocarbon refrigerants by technicians.

RRA charges a levy on all imports of ODS and SGG refrigerants, in bulk and in equipment, on a per kilogram basis to cover the costs of recovery and destruction. RRA makes payments to technicians that recover refrigerant and return it to the wholesalers, who then transport the refrigerant to RRA for disposal and /or destruction. The import levy currently covers the cost of the transport, storage and destruction of used ODS and SGG in Australia.

The Act and its regulations also regulate the sale, purchase, use, storage and disposal of ODS and SGG in Australia. Refrigerants and fire extinguishing agents can only be acquired by a licensed business holding a trading authorisation and all technicians that handle the gas must hold an appropriate handling licence. This licence obliges technicians to have minimum skills, to abide by relevant codes of practice and to meet appropriate Australian standards. Technicians are required to recover refrigerants during installation, servicing and decommissioning and to return used and unwanted refrigerant to an approved disposal facility.

Technicians wishing to dispose of used refrigerant firstly obtain a 'recovery cylinder' from a refrigerant wholesaler for use in recovery of used and contaminated refrigerant during the maintenance and decommissioning of systems. The technician then returns full cylinders to the refrigerant wholesaler, and the wholesaler weighs the refrigerant and pays a credit to the technician. The large majority of refrigerant recovered is from the commercial refrigeration and air conditioning industry, with increasing quantities coming from the mobile air-conditioning industry.

Conditions of refrigerant handling licenses include requirements that:

- only refillable containers are used for the storage of refrigerant;
- refrigerant recovered from RAC equipment (except halon) are surrendered to the holder of a refrigerant trading authorisation or to the operator of an approved refrigerant destruction facility;
- records are kept on refrigerant bought, sold and recovered each quarter;

- equipment preventing avoidable emissions is operating correctly; and
- adequate amounts of equipment are available and cylinders regularly leak checked.

Holders of refrigerant handling licenses must also have in place a risk management plan for the storage and handling of refrigerant and must ensure that destruction of any refrigerant is only carried out by the operator of an approved refrigerant destruction facility. Destruction facilities must be approved by the Minister for the Environment, Heritage and the Arts and be listed by the Montreal Protocol as an approved technology. Holders of refrigerant trading licences are also required to accept any surrendered refrigerant that appears to be intended for use in refrigeration or air-conditioning equipment.

Any discharge of scheduled substances, which is not in accordance with the regulations, is an offence under section 45B of the Act.

Disposal and destruction of ODS and SGGs in Australia

The Act allows for the establishment of refrigerant destruction facilities in Australia. Currently one facility has been approved and is operational (BCD Technologies). The Act requires that any destruction facility approved must operate consistently with Montreal Protocol obligations and that a destruction efficiency of at least 99.999% is achieved.

RRA uses the Australian developed plasma-arc technology located at a plant owned and operated in Melbourne by BCD Technologies to destroy refrigerants. This transforms fluorocarbon refrigerants to salty water, with higher than 99.999% efficiency, in accordance with Montreal Protocol obligations. This facility effectively eliminates various waste types such as PCBs, pesticides, ODS, SGGs and halons. RRA has facilitated the recovery of approximately 2000 tonnes of ozone depleting and synthetic greenhouse gas refrigerants since the program began in 1993.

RRA and the Australian Refrigeration Council (ARC) also conduct educational activities to educate the commercial refrigeration and air conditioning sector on best practices. In 2008, a high profile public education campaign was conducted by the ARC to educate consumers on the importance of using licensed technicians and of having refrigeration and air-conditioning systems regularly serviced.

The issue of recycling or reusing ODS is a decision for commercial businesses to make and, generally, refrigerant is reused by the technician or premises if it isn't contaminated. All refrigerant currently recovered at end of life is sent for disposal and/or destruction. In the late 1990s some CFCs were reprocessed by National Halon Bank back to specification due to dwindling availability. At present, neither RRA nor BCD Technologies purify recovered refrigerant for re-use.

Of the recovered refrigerant, each year approximately 80% is destroyed, 7% is used as feedstock, 7% is reclaimed, and 5% is stored. To date, the program has prevented the emission of sufficient ozone depleting refrigerant to destroy 7.5 million tonnes of stratospheric ozone (see graphs at the end of this paper).

Halon recovery, management and disposal in Australia

Australia finalised its Halon Management Strategy in February 2000. It outlines Australia's commitment to the effective management of halon stocks until a complete phase out of the use of halon can be achieved. Under the Act, Australia ceased importation of halons from 31 December 1992, for all but essential uses.

Critical to the success of this Strategy is the ongoing operation and development of the National Halon Bank (the Bank) as a regional environmental facility for the safe management of surplus and essential use stocks of halon. The Bank was established in 1993 and is one of the largest halon depositories in the world.

Australia takes account of its international obligations when deciding whether to destroy or recycle halon. Such considerations include the finding by the Montreal Protocol's Halon Technical Options Committee that very few halon 1211 applications are essential uses and stocks contained in existing equipment provide a more than adequate supply to meet these essential use applications. Australia has destroyed in excess of 1,200 tonnes of halon 1211 to date.

Halon held at the Bank originated from industry and government agencies following the decommissioning of non-essential halon fire protection systems. A service charge, sufficient to fund the collection, storage and disposal of the halon was levied on deposits of halon 1211 and some deposits of halon 1301. Private individuals and small businesses have been able to surrender their halon at no cost.

The Bank currently operates as a:

- disposal facility for halon remaining in the community;
- commercial storage facility for halon held on behalf of domestic and international clients;
- storage facility for Australia's reserve of halon;
- service facility for users of halon; and a
- host facility for the operation of the BCD owned PLASMA Plasma Arc facility owned by BCD Technologies and its associated activities.

The Bank continues to provide a disposal service for halon 1211 and halon 1301 that is surrendered. The Bank contract provides for a "free call" service to arrange collection of halon. A disposal network, based on the metropolitan and country fire brigades enables members of the public to dispose of their unwanted extinguishers in a controlled environment. A similar service is provided for fire protection companies. This halon is mainly in the form of halon 1211 fire extinguishers and runs to about 10 tonnes per annum.

The collection is at no cost to the public. Halon fire extinguishers are still in use in the community despite intensive publicity for over 15 years. Cessation of the disposal service may result in the emission of the halon to the atmosphere through the inappropriate disposal of the gas or the systems.

The Bank also assists with the commercial disposal of halon 1211 and halon 1301 from businesses, or from overseas. The fee for disposal is negotiated on a case by

case basis. Revenue from the sale of surplus halon and other commercial activities of the Bank is returned in full to ozone protection activities, including costs associated with the management of the Bank. The Bank also holds bulk gas and various cylinders for RRA and others on a commercial basis. The fees are negotiated on a case by case basis.

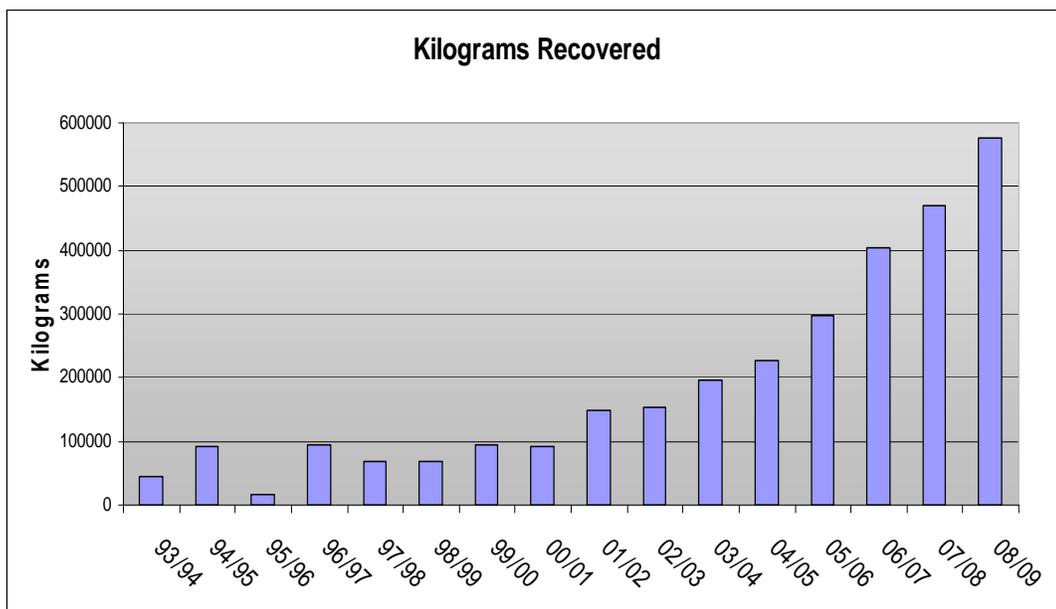
Material recovered from surrendered halon is available for sale or re-use for essential uses to help meet the cost of the service.

The Bank holds 200 tonnes of halon 1301 and 70 tonnes of halon 1211 to meet Australia's estimated needs to 2030. The size of the reserve was established following an operational review by a consultancy in 1998 and reviewed in 2003. The halon 1301 stock is stored in 500 kg cylinders and is subject to a structured leak monitoring regime.

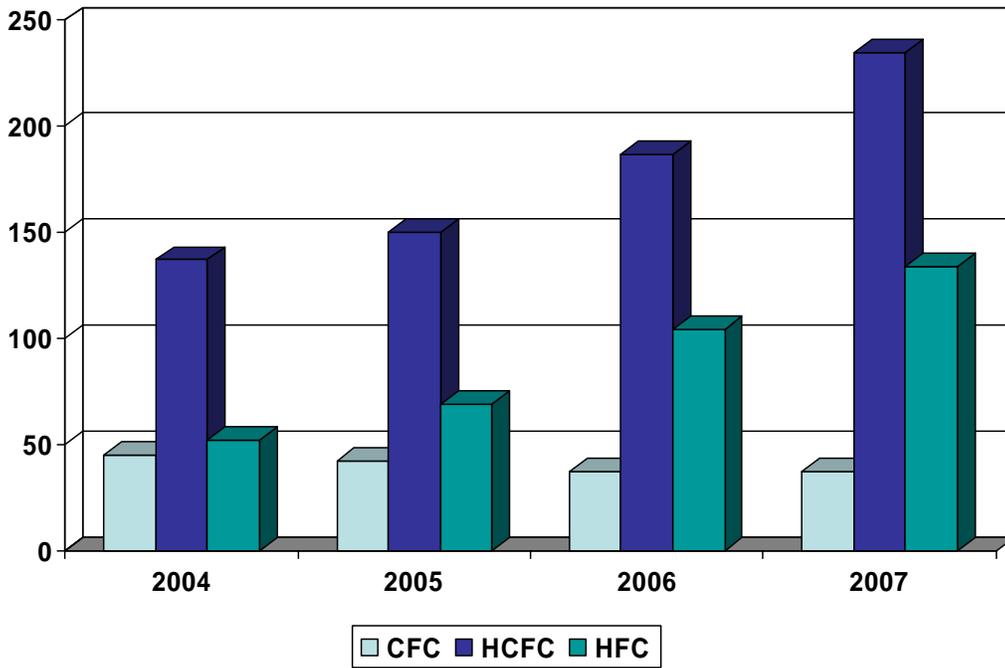
The Bank has developed recovery and reclamation units which can be used to safely transfer and recover halon. The Bank provides repackaging services to users and holders of halon. These services are required, for example, when cylinders need to be pressure tested and the halon has to be temporarily stored while the test facility carries out its work.

The Bank also operates a laboratory for quality assurance of stock and to provide information on the material being destroyed. The laboratory has been accredited by the National Association of Testing Authorities, Australia to assist in compliance and enforcement activities associated with the *Ozone Protection and Synthetic Greenhouse Gas Management Act 1989* in relation to halons. The laboratory is available to certify purity of halon on a cost recovery basis.

Refrigerant recovered by RRA (tonnes)



**Type of refrigerant covered (ODP tonnes)
2004-2007**



**Recovered Refrigerant CO₂e
'000's Tonnes By Species 2004 – 2007**

