Southern Cross Metal Recyclers

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To the Department

Background

Our company is a leader in the responsible decommissioning of refrigerators and air conditioners (RAC) in Victoria. Actively lobbying the Environment Protection Agency (EPA) and the Australian Refrigeration Council (ARC), we have for many years pushed for a state wide approach to the appropriate disposal of RAC equipment. It has been our extensive experience that Local Government Authorities (LGA’s) and current recycling methodologies are falling very short of the expectations / requirements of the EPA and the ARC. We applied to the ESC and have been an accredited person (AP) within the VEET scheme from its very early implementation. We have worked closely with the DPI and ESC to help develop procedures, assignment forms and frameworks relevant to this activity.  Our intention from the outset was to utilize this program to partially fund the decommissioning processes on RAC equipment. As detailed in the KPMG report produced for the use and benefit of the Department of the Environment<http://www.environment.gov.au/system/files/resources/73c361c3-4a03-4b11-8dcb-a0b515ec5a2c/files/end-life-domestic-rac-equipment-australia_0.docx> it clearly demonstrates the environmental damage including the global warming effect that inadequate industry practices pertaining to RAC destruction is having on our environment.

I would like to submit a proposal to modify / expand / change a current prescribed activity within the current VEET framework. In particular reference to “Refrigerator Destruction”. Currently the parameters pertaining to this activity have a cut off at refrigerators that are manufactured pre 1996. We believe that the parameter can be extended to refrigerators manufactured up to and including 2006, current data shows energy usage and harmful refrigerants are similar to data of pre 1996 refrigerators. Our initiative is leading edge as we are partnered with all the large department chains involved in “take back policies and programs” for old refrigerators for a coordinated degassing and decommissioning program. Our company’s role and position in the market place is that of an interface between the owner / retailer of the refrigerator / air conditioner and that of the shredding company that will finally process the item into fragmented components for recycling. If we have an opportunity to degas these items before the shredding / fragmentation process it will enable us to capture and reclaim the gas into appropriate bottles for recycling and destruction. Without our intervention the RAC equipment will self-degas to the atmosphere at the point of shredding / fragmentation.  In order for us to continue this environmentally crucial work we need to encourage your department to look at widening the VEET criteria and the associated parameters and legislation on this activity, I.E. to include refrigerators up to the year of manufacture being 2006. The outcome of these suggested changes would be to assist us to provide a funding model for us continue our vital program.

Please be encouraged to visit our page at:

<http://www.southerncrossmetalrecyclers.com.au/our-services/fridge-freezer-recycling-program/>

to gain a complete understanding of our methods and dedication to responsible RAC recycling.

I hope and trust that you will view this request as a valuable and crucial opportunity to reduce GHG , Electricity and GWP (global worming potential) from Refrigerators including their harmful refrigerants being discharged to atmosphere and encourage responsible recycling.

**Energy Usage (KW) & Consumer Costs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  | 2008 | 2015 |
| Pre 1996 | 690 | Kilowatts Hours per year | $108.81 |  |
| Post 1996 | 485 | Kilowatts Hours per year | $76.48 | $135.80 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Post 2009 | 388 | Kilowatts Hours per year | $61.18 | $104.76 |
|  |  |  |  |  |
|  |  |  |  |  |

Data represents middle of range 515 ltr fridge from 1989 to 2009. Figures show further reductions in energy usage post 2009 reducing electricity consummation of 96 KW per annum an average $27 per annum savings to consumer.

Future Abatement projections @ 25,000 Refrigerators destroyed per annum (30%pre 2000 & 70% post 2000) =3,682,500 KW = 3,682.5 tonnes of CO2 equivalent per annum

**Calculate the carbon dioxide equivalent of a quantity of R gas**

You calculate the carbon dioxide equivalent of a quantity of R gas by multiplying the mass of the gas (in tonnes), by the gas’ global warming potential (GWP).

You’ll usually find the mass of an R gas expressed in kilograms (kg) on product labels etc. To convert the mass to tonnes, divide by 1,000.

**Example calculation**

The amount in tonnes of CO2 equivalent is the mass (in tonnes) of R gas multiplied by the GWP of that R gas.

For example the global warming potential of R134A is 1,300. Therefore the tonnes CO2 equivalent of 10kg of R134A is calculated as follows:

1. R134A the GWP = 1,300
2. = (10/1,000) \* 1300
3. = 13 tonnes of CO2 equivalent

**SCMR Current Degassing Program**

Approximately 15,000 Refrigerators per annum

30% R12 = 4,500 (funded by the VEET Program)

70% R134A = 10,500 (Unfunded)

Assume 130 grams of gas per refrigerator on average

R12 the GWP = 2,400

= (.13/1,000) \* 2,400

= 0.312 tonnes of CO2 equivalent

= 0.312 \*4,500 = 1,404 tonnes of CO2 equivalent

R134A the GWP = 1,300

= (.13/1,000) \* 1300

= 0.169 tonnes of CO2 equivalent

= 0.169\*10,500 = 1,774.5 tonnes of CO2 equivalent

Total Abatement of Green House Gas (tonnes)

= 3,178.5 tonnes of CO2 equivalent per annum

Future Abatement Projections @ 25,000 Refrigerators per annum (30% R12 & 70% R134A

= 5,297.5 tonnes of CO2 equivalent per annum

[**Refrigerants - Environment Properties**](http://www.engineeringtoolbox.com/Refrigerants-Environment-Properties-d_1220.html)

**Refrigerants - Ozone Depletion (*ODP*) and Global Warming Potential (*GWP*)**

Common refrigerants and Ozone Depletion Potential (*ODP*) and Global Warming Potential (*GWP*) are indicated below.

* Ozone Depletion Potential (*ODP*) of a chemical compound is the relative amount of degradation  it can cause to the ozone layer
* Global Warming Potential (*GWP*) is a measure of how much a given mass of a gas contributes to global warming. *GWP* is a relative scale which compares the amount of heat trapped by greenhouse gas to the amount of heat trapped in the same mass of Carbon Dioxide. The *GWP* of Carbon Dioxide is by definition 1.

| Refrigerant | Ozone Depletion Potential (*ODP*) | Global Warming Potential (*GWP*) |
| --- | --- | --- |
| R-11 Trichlorofluoromethane | 1.0 | 4000 |
| R-12 Dichlorodifluoromethane | 1.0 | 2400 |
| R-13 B1 Bromotrifluoromethane | 10 |   |
| R-22 Chlorodifluoromethane | 0.05 | 1700 |
| R-32 Difluoromethane | 0 | 650 |
| R-113 Trichlorotrifluoroethane | 0.8 | 4800 |
| R-114 Dichlorotetrafluoroethane | 1.0 | 3.9 |
| R-123 Dichlorotrifluoroethane | 0.02 | 0.02 |
| R-124 Chlorotetrafluoroethane | 0.02 | 620 |
| R-125 Pentafluoroethane | 0 | 3400 |
| R-134a Tetrafluoroethane | 0 | 1300 |
| R-143a Trifluoroethane | 0 | 4300 |
| R-152a Difluoroethane | 0 | 120 |
| R-245a Pentafluoropropane | 0 |   |
| R-401A (53% R-22, 34% R-124, 13% R-152a) | 0.37 | 1100 |
| R-401B (61% R-22, 28% R-124, 11% R-152a) | 0.04 | 1200 |
| R-402A (38% R-22, 60% R-125, 2% R-290) | 0.02 | 2600 |
| R-404A (44% R-125, 52% R-143a,  R-134a) | 0 | 3300 |
| R-407A (20% R-32, 40% R-125, 40% R-134a) | 0 | 2000 |
| R-407C (23% R-32, 25% R-125, 52% R-134a) | 0 | 1600 |
| R-502 (48.8% R-22, 51.2% R-115) | 0.283 | 4.1 |
| R-507 (45% R-125, 55% R-143) | 0 | 3300 |
| R-717 Ammonia - NH3 | 0 | 0 |
| R-718 Water - H20 | 0 |   |
| R-729 Air | 0 |   |
| R-744 Carbon Dioxide - CO2 |   | 1\* |

\*  CO2 is the GWP reference