

CLIMATE CHANGE POLICY FRAMEWORK FOR REFRIGERATION AND AIR CONDITIONING SECTOR

A proposal by the European Partnership for Energy and the Environment (EPEE) for action in the European Union

I. INTRODUCTION

Set out below is a proposal for an EU approach to tackling the challenge of reducing the potential environmental impact of refrigeration, air conditioning and heat pump (including reversible air conditioning) equipment, and so contribute to the EU's objective of reducing its greenhouse gas emissions.

As the European Partnership for Energy and the Environment (EPEE) is a European based association our approach is EU focused, we strongly believe that it has many elements and aspects to bring to the issue at a wider global level.

Our objective is to achieve this by:

- industry designing and marketing equipment with
 - a) increased energy efficiency; and
 - b) enhanced designs to prevent emissions of refrigerants; and
- ensuring that users of refrigerants utilise them responsibly.

This means a departure from "business as usual" by all those involved in the life-cycle of refrigerants.

Our proposed approach to achieving the responsible use of refrigerants is based on:

- encouraging manufacturers to continue to develop the most environmentally sound, safe and economically viable solutions for air conditioning, heat pumps (including reversible air-conditioning) and refrigeration systems;
- promoting good practices for installation and leak testing of distributed refrigerant system installations, and the recovery and recycling of refrigerants;
- improving consumer awareness of the importance of purchasing energy efficient equipment;
- further limiting the environmental impact of energy consumption during the product life cycle of installed systems by documented regular maintenance procedures;
- proposing that (1) all actors connected to refrigerant use strive to manage and improve their environmental performance; and (2) that these actions be backed by government action whether by legislation or the development of alternative regulatory mechanisms. (An example of co-regulation would be the Netherlands, with their effective RLK legislation and STEK implementation scheme.); and

- proposing that an EU framework approach is needed to ensure uniformity of action across the EU. However, policies aimed at individual sectors will need to be developed separately in order to suit their very different circumstances.

This is particularly true between self-contained appliances such as refrigerators, and stationary and mobile equipment.

One of the key ways to achieve this is best via a European Framework legislation on Fluorocarbons.

II. OBJECTIVE OF A FRAMEWORK DIRECTIVE

The purpose of a Directive would be to:

- a) minimise the indirect impact of CO₂ emissions generated from the production of energy required to power equipment / systems by improved design and system control for energy efficiency and minimise the direct impact of refrigerants on climate change by reducing the emissions of greenhouse gases by improved design, installation, maintenance and disposal; and
- b) mandate the responsible use of refrigerants in equipment / systems.

HFCs are used extensively as refrigerants due to the regulatory-induced change away from ozone-depleting refrigerants. This process should not be delayed by new policies or regulations that undermine consumer confidence while reliable, safe and energy efficient alternatives are made available on the market.

Taking into account the total refrigerant market, other refrigerants, like hydrocarbons, ammonia, CO₂ and water vapour are in use in certain applications, but are still short of widespread viability. Further technical research and development is required to resolve hazard, safety, cost and energy efficiency concerns before these refrigerants can reasonably be described as viable alternatives for the broad based use of HFCs.

III. SCOPE

Achieving this objective requires that actions are taken by all the actors involved in the life cycle of refrigerants: producers; manufacturers of equipment; architects, specifiers and construction engineers involved in the design of buildings/plants; users and those qualified to install, maintain and de-commission equipment (including the recovery and recycling of refrigerants).

It should apply to all equipment produced, imported and used in the European Union for cooling and heating. A list of possible categories of applications to be covered is outlined in the last section of this document.

IV. REPORTING AND TARGETS

An accurate assessment of the use, refilling, recovery and recycling of refrigerant needs to be built up in the European Union through regular reporting by the Member States. Currently, there is insufficient authoritative and publicly available knowledge of the real life environmental performances of refrigeration, air conditioning and heat pump (including reversible air conditioning) equipment. This has to be rectified before realistic targets can be set. Thus initial action should concentrate on achieving general improvements in current practices.

V. POLICY APPROACH

The aim of policy in the field should be three-fold:

- a) action on self contained equipment and major system components;
- b) action on installed systems at the design stage; and
- c) action during the installation, use, maintenance and decommissioning of equipment/ systems.

It is important to realise when assessing suitable policies to achieve these aims that:

- a) equipment and component design decisions are largely within the control of manufacturers;
- b) equipment and component manufacturers, system designers and specifiers all participate in responsible installations; and
- c) service and maintenance of equipment /components must be accomplished by trained and certified technicians, outside the control of manufacturers.

In recognition of this fact, the development of regulations or alternative regulatory mechanisms needs to be tailored to meet the specific needs of the different products and applications.

1. Action on Equipment and System Components

Industry needs to compete fairly in designing and marketing energy efficient equipment. The primary incentive is that the use of energy efficient products results in lower running costs of equipment. The purchase of more energy efficient products is already encouraged through the energy efficient standards and voluntary agreements in some sectors.

To ensure the integrity of self-declarations made by manufacturers, we believe that all specifications, efficiency and capacity claims of refrigerant-utilising equipment should be measured in full accordance to the official industry standard and be verified through a recognised certification programme such as EUROVENT/CECOMAF and ASERCOM.

A second instrument would be the establishment of EU tightness standards for components/systems. For example, this could be accomplished by incorporating relevant requirements for parts into a revised version of the EN 378 standard (entitled Refrigerating Systems and Heat Pumps - Safety and Environmental Requirements).

2. Action on Field Installed Systems

This is a more complex problem, as the performance of field installed systems depends on competent installation, optimisation and maintenance. In other words, the benefits of using the most energy efficient components can be completely undermined by poor installation and maintenance. We expect that the best results will be gained by combining the use of energy efficient components with demanding installation and maintenance standards, in strict accordance with the manufacturers recommendations.

3. Action on Servicing and Maintenance

Equipment/systems need to be properly maintained to ensure optimal performance. Currently there are few requirements to ensure that this is done. New requirements shall cover leak detection and repair procedures. This should be extended to oblige users of equipment with more than 3 kg of refrigerant to have maintenance performed by trained technicians, covering not only leak detection and repair procedures, but also factors such as heat exchanger cleaning and the correct operation of controls.

VI. ACHIEVING RESPONSIBLE USE

To achieve the aim of improving the environmental performance of refrigerant equipment over their whole life cycle all actors need understand their respective roles.

1. Producers and Distributors of Refrigerants

Producers and distributors of refrigerants are responsible for:

- encouraging the responsible use of their products and providing advice on the safe handling, transport, containment and recycling of their products;
- supplying only manufacturers and persons who are trained to handle equipment containing refrigerants; and
- Providing accurate annual statistics regarding the volume of refrigerants supplied to the air conditioning and refrigeration sector.

2. Manufacturers and Importers of Equipment and Field Installed Systems

Manufacturers and importers of equipment are responsible for:

- encouraging retail consumers, users, installers, architects, specifiers and construction engineers involved in the design of buildings/plants, to specify the procurement of energy efficient products by supporting labelling schemes;

- producing equipment which implements emission-limiting technology by applying EU rules for equipment, components and field-erected systems;
- establishing and attaining required efficiency standards for products over time;
- continuing to develop the most environmentally sound, safe and economically viable solutions for air conditioning, refrigeration and heat pump (including reversible air conditioning) systems;
- ensuring that during manufacturing only qualified personnel handle refrigerants, braze (copper pipe welding) and dispose of parts and equipment;
- reporting annual refrigerant usage in all new products / systems to the appropriate national bodies;
- providing specialist training, product information and advice for trained installation and maintenance workers and users on best practice installation, leak detection techniques, and maintenance of equipment, e.g. via dedicated web sites;
- providing product information and advice on the latest installation, maintenance and decommissioning technologies to bodies overseeing the certification and training of professional installation and maintenance workers; and
- raising the awareness of users of installed equipment of the environmental and financial benefits of responsible use of refrigerants, e.g. regularly promoting cases of good practices in installation, leak detection and decommissioning.

3. Users of refrigeration, air conditioning and heat pump (including reversible air conditioning) systems

Users of products and systems containing more than 3 kg of refrigerant are responsible for:

- using only trained personnel to install, maintain and dispose of their equipment;
- augmenting the performance of their equipment by taking basic precautions such as night covers on display cabinets to reduce energy consumption; and
- keeping log books detailing maintenance records, leak detection, accidents, annual amounts of refrigerant used in servicing of equipment, and regularly reporting their usage of refrigerants to the appropriate bodies in the Member States. Such records should be subject to periodic audit by an appropriate authority.

4. European Countries

National and/or regional bodies are responsible for:

- ensuring that only properly trained operators can handle refrigerants and install, maintain and de-commission refrigerating and air conditioning systems;

- obliging users (or their contracted maintenance company) of refrigerants to have annual maintenance and inspection contracts and to report their refrigerant consumption via log-books;
- establishing appropriate bodies to develop certification qualifications for refrigerant handlers and brazers (i.e. copper welding/brazing certificates); and
- collecting data from refrigerant manufacturers and log books kept by users of refrigerants and providing this data on refrigerant consumption in their territories to the European Commission.

5. The European Legislators

EU authorities are responsible for:

- formulating a framework refrigerants Directive to ensure coherency of action by Member States on refrigerant use and so prevent unnecessary disruption of the workings of the internal market;
- developing an EU standard for refrigeration, air conditioning and heat pump (including reversible air conditioning) equipment. This could be done based on the good results achieved in the Netherlands and the experience in other countries. The improvements should be included in the revised version of EN 378 entitled Refrigerating Systems and Heat Pumps - Safety and Environmental Requirements). The members of the related committee has started this process already.
- establishing a data base on the usage rates of refrigerants in the European Union based on information from Member States. Use this "real life" data to identify areas for priority action.

VII. SECTORAL APPROACH

The air conditioning, heat pump (including reversible air conditioning) and refrigeration industry is very fragmented and produces equipment and components with a multitude of applications. Although a single legislative framework should be developed at EU-level, individual approaches need to be tailored to the different product segments. Below is an initial idea for the development of a sectoral approach by categories.

1. Stationary Equipment and Systems

- a) Domestic refrigeration and air conditioning
 - Domestic refrigeration and air conditioning appliances
 - Residential air conditioning
 - Split systems, multi split & variable refrigerant flow systems
 - Self contained packaged cooling only and reversible heat pumps (below 45 KW cooling capacity)
- b) Commercial / Industrial refrigeration
 - Compressors

- Condensers
 - Evaporators
 - Condensing units
 - Display cabinets remote
 - Display cabinets plug in
 - Cold room walls
- c) Commercial air conditioning
- Self contained package (above 45 KW cooling capacity)
 - Water cooled chillers
 - Air cooled chillers
 - Reversible heat pump systems
 - Condensers
 - Condensing unit
- d) Other auxiliary equipment
- Cooling towers
 - Circulating pumps
 - Fans
 - Air handling units

2. Mobile Equipment

- Mobile air conditioning in cars, light and heavy duty trucks, buses, coaches, rail and maritime vessels
- Mobile refrigeration – road, rail, sea and inland waterways
- Refrigerated container transport