Brussels,7 December 2004

EU PROPOSED LEGISLATION ON FLUORINATED GREENHOUSE GASES THE CASE OF SF_6

P. HORROCKS[1]

European Commission, Environment Directorate, B-1049 Brussels, Belgium
peter.horrocks@cec.eu.int

ABSTRACT

European legislation will play an important role in controlling emissions of the fluorinated gases that are controlled by the Kyoto Protocol. Sulphur hexafluoride (SF_6), which has several important applications in a number of sectors, is one of the most potent of these fluorinated greenhouse gases. The European Commission made a proposal for a Regulation to control these fluorinated gases in August 2003 after extensive consultations with stakeholders and analysis of the costs and benefits. This proposal, which will contribute to meeting the EU's Kyoto target, aims to reduce emissions of these gases through better containment and recovery; training and certification of personnel involved; improved reporting and for some applications and uses where containment and recovery is impracticable the prohibition of marketing and use respectively. The Commission proposal has been examined by the European Parliament in a first reading which made some amendments and subsequently by the Council of Ministers which has now established a political agreement. On the whole this text clarifies and strengthens in some respects the Commission's proposal. The next stage is for the Parliament to examine the Council's agreed text early in 2005 when it can propose new amendments that it may need to negotiate with the Council before a final legal text is secured.

Keywords: sulphur hexafluoride; greenhouse gas emissions, Kyoto Protocol, prohibition, containment, marketing and use bans

---

[1] The positions expressed in this paper are those of the author and do not represent the official position of the European Commission.

INTRODUCTION

Climate change is one of the greatest environmental and economic challenges facing humanity. The increased frequency of extreme weather events and the fact that the 1990s was the warmest decade of the 20th century, which was the warmest of the millennium demonstrates, that climate change is not some distant threat but is happening right now. The basis for EU policy on climate change at the international level, aimed at arresting and reversing this trend, is the United Nations Framework Convention on Climate Change (UNFCCC) of 1992 and the 1997 Kyoto Protocol. The latter requires industrialised countries to reduce their collective emissions of greenhouse gases by 5.2% below their 1990 levels for the period 2008 to 2012 (the first commitment period). The EU is fully committed to comply with its obligations under the UNFCCC and the Kyoto Protocol, namely to reduce its greenhouse gas emissions by 8% over 1990 levels by the period 2008-2012.

The major greenhouse gas is carbon dioxide (CO_2). However, the basket of greenhouse gases controlled by the Kyoto Protocol includes, *inter alia,* the so-called industrial greenhouse gases, sulphur hexafluoride, hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs) which have large global warming potentials (GWP)[2]. Sulphur hexafluoride, ($SF_{6,}$), the subject of this paper, is one of the most powerful fluorinated greenhouse gases. The International Panel on Climate Change (IPCC) in its third assessment report (TAR) calculated that $SF_{6,}$ had an atmospheric lifetime of 3200 years and that over a 100 year time horizon it had a GWP of 22200.

[2] "Global Warming Potential" expresses the climatic warming potential of a greenhouse gas relative to that of carbon dioxide. The standard Global Warming Potential (GWP) is calculated in terms of the 100 year warming potential of one kilogram of a gas relative to one kilogram of CO_2.

EUROPEAN UNION PROPOSED MEASURES TO REDUCE EMISSIONS OF FLUORINATED GASES

European Commission Proposal on certain fluorinated greenhouse gases

Complying with its Kyoto emission reduction target of 8% within the first commitment period - an overall reduction of 336 million tonnes of carbon dioxide equivalent - is crucial to the EU's credibility. Meeting this objective depends on putting in place effective policies and measures. Through the European Climate Change Programme (ECCP), established in June 2000, the European Commission has identified cost-effective measures that could be taken and so enable the European Community to meet its Kyoto Protocol target. The ECCP was a multi-stakeholder consultative process comprising sectoral working groups, including a working group on fluorinated gases. The latter consisted of representatives from the most relevant industrial sectors, including those that produced and used SF_6, environmental non-governmental organisations and Member States of the EU.

The report of the fluorinated gases working group of June 2001 stated that the EU's fluorinated gas emissions in 1995 were around 65 million tonnes of CO_2 equivalent or 2% of its total greenhouse gas emissions. Assuming no additional measures were taken, emissions of these gases were forecast to increase to around 98 million tonnes of CO_2 equivalent by 2010, representing 2% to 4% of total projected EU greenhouse gas emissions. The working group made a number of recommendations for action to reduce emissions of fluorinated gases, and there was a strong consensus amongst the stakeholders for a legislative framework at the Community level to improve the containment and monitoring of fluorinated gases, and to introduce marketing and use restrictions for certain applications.

On the basis of the work of the ECCP and a number of studies undertaken by the Directorate General for Environment of the European Commission on costs and benefits, the Commission made a proposal for a Regulation to control certain fluorinated greenhouse gases in August 2003. The proposal is expected to reduce projected emissions of fluorinated gases by around 23 million tonnes of

CO_2 equivalent by 2010, and even greater reductions in the period after as some provisions will not have a significant impact until then.[3]

Proposed Regulatory Controls on SF_6

The Commission proposal for a Regulation which covers the three industrial greenhouse gases in the Kyoto protocol has three main elements. First there are provisions on containment and recovery which covers the operation, maintenance and end-of-life of certain equipment and includes minimum training and certification for servicing personnel. Second, there are reporting provisions that will require information on production, imports and exports of fluorinated gases to be obtained in order to help to validate the forecasts made by the emissions models. Third, there are a number of marketing and use bans of these fluorinated gases including the phase out of mobile air conditioning systems using fluorinated gases with a global warming potential above 150.

European Council Political Agreement of October 2004

In its first reading on the Commission's proposal on 31 March 2004, the European Parliament proposed a number of amendments to the Commission proposal. The Commission indicated its willingness to adopt a significant number of these amendments where they could reinforce and clarify the Commission's proposal. On the 14 October 2004 the Council of Ministers meeting in Luxembourg adopted a Political Agreement[4], which also included a significant number of the Parliament's amendments, on the basis of the Commission's proposal.

The Political Agreement now consists of two elements, a Directive to phase out HFC-134a from motor vehicle air conditioning systems that will apply to all new vehicle models coming off the production lines as of 2011 and by 2017, every new vehicle produced will have to use alternatives. The other element is a Regulation that will apply containment, recovery and labelling provisions to so-

---

[3] In the European Union the normal legislative procedure is Co-Decision by the European Parliament and the Council. The European Parliament consists of directly elected MEPs that adopt legislation, after consideration by formal committees, through formal opinions voted by the whole Parliament. The Council is the institution that represents the 25 Member State governments.

[4] The political agreement becomes a "common position" once it is translated into all the official languages of the EU and is then formally adopted by the Council. The common position is then published in the Official Journal of the EU.

called 'stationary' applications such as refrigeration, air conditioning, fire fighting and high-voltage switchgear; requires training and certification for personnel and puts in place a number of use bans (e.g. magnesium production) and prohibitions etc.

As regards the Regulation, the issues that are of particular concern to the producers and users of SF_6 are the following:

Recovery Measures: the containment measures – inspections - apply to stationary applications such as refrigeration, air conditioning and fire systems that use predominantly HFCs. It does not apply to electrical equipment using SF_6 as a dielectric, such as high voltage switch gear, since the evidence suggests that the leakage rate and hence emissions from such installations during operation is very small as a result of “voluntary commitments” from the industry. However, there is an obligation on operators of high voltage switchgear to ensure that there is the proper recovery of SF_6 by certified personnel for the recycling, reclamation and destruction. There is also an obligation on operators to recover SF_6 from other applications, provided it is technically feasible and does not entail disproportionate cost.

Training and certification: The personnel undertaking the recovery of SF_6 need to have the necessary certification. The operator is responsible for ensuring that only certified personnel are used. The Commission will establish by the time the Regulation enters into force minimum requirements and the mutual recognition of certification between Member States. On this basis, the Member States will either need to adjust their existing training systems or to introduce new certification schemes.

Labelling: This requirement was not in the original Commission proposal. It requires, *inter alia*, that switch gear equipment (both high and medium voltage) containing SF_6 cannot be placed on the EU market unless the chemical name, using the accepted industry nomenclature, is clearly and indelibly indicated as well as the information that this is a fluorinated greenhouse gas. Hermetically sealed gas insulated systems, such as medium voltage switchgear, are also covered by this provision.

Use Restrictions: There are two main use restrictions. The first concerns the use of SF_6 as a cover gas in magnesium die-casting. In general the Commission proposed that the use of SF_6 in the magnesium die-casting industry should be prohibited from the 1 January 2007 on the grounds that it was cost-effective to

use SO_2, plants using 500kg or less were exempt. In the Political Agreement the phase out was extended to the 1 January 2008 and the exemption limit was modified to 850kg on the grounds that a small number of small magnesiumdie-casting enterprises would have difficulty in adapting.

The other use ban is on putting SF_6 into vehicle tyres from the entry into force of the Regulation.

Marketing Prohibitions: for some products that contain SF_6 there is a placing on the market prohibition, the applications are listed below:

Application	**Date of Prohibition**	**Comment**
Non-refillable containers	Date of entry into force	SF_6 is usually delivered in refillable containers to equipment manufacturers and users
Windows for domestic use	Date of entry into force	Cost-effective alternatives such as argon
Other windows	One year after the date of entry into force	Mainly for airports – some adjustment time needed
Footwear	1 July 2006	This date gave manufacturer time to make appropriate adjustments
Tyres	Date of entry into force	Supports the use ban

Data Reporting: Producers and importers of fluorinated gases such as SF_6 above one tonne are obliged to report to the Commission for each calendar year the amount of each fluorinated gas placed on the market and indicate the main categories of applications. The quantities of each gas recycled, reclaimed or destroyed also have to be reported. Exporters have a similar obligation but they do not have to indicate the main categories of applications only the amounts of fluorinated greenhouse gas exported. This information will enable the Commission to build up a data base on the amount of fluorinated gases produced, imported and exported and this together with the emission data for the major applications will help the EU in establishing emissions of these gases.

Review: the proposed Regulation is only a first step. A number of issues require further research before a fully comprehensive framework for the containment of fluorinated gases can be established. The Political Agreement provides for rather an extensive review within four years when the Commission has to publish a report based on the experience of the application of this Regulation. As regards SF_6 the following items are of particular interest:

- evaluate the training and certification programmes established by Member States under Article 5(2);
- assess the need for European Community standards relating to the control of emissions of fluorinated greenhouse gases from products and equipment, in particular as regards foam, including technical requirements with respect to the design of products and equipment;
- assess the need for the development and dissemination of notes describing best available techniques and best environmental practices concerning the prevention and minimisation of emissions of fluorinated greenhouse gases;
- an overall summary of the development, both within the EU and at an international level, of the state of technology, in particular as regards foams, experience gained, environmental requirements and any impacts on the functioning of the internal market;
- assess whether the substitution of sulphur hexafluoride in sand casting, permanent mould casting and high-pressure die-casting is technically feasible and cost-effective and see if prohibition is feasible and review the exemption for small amounts of SF_6 (less than 800kg) in the light of further assessment of the available alternatives by 1 January 2010;
- assess whether a marketing prohibition of further products and equipment containing fluorinated gases in Annex II is technically feasible and cost-effective.

Legal Base: The original proposal of the Commission was based on Article 95 of the European Community (EC) Treaty on the grounds that even though the main objective is to protect the environment there is a need to protect the internal market of the Community by having harmonised requirements on monitoring, containment and marketing. As regards the Regulation element of the Political Agreement a dual legal base is applied, Article 95 applies to the provisions concerning prohibitions, labelling and the containment, recovery and certification provisions are under Article 175(1). These are minimum standards so it would be

possible for Member States to implement stricter rules in order to meet environmental objectives.

Next Steps

The Political Agreement reached by the Council of Ministers on the 14 October 2004 will provide a solid base for the final shape of this Regulation. However, the legislative process is still not finished; the next step is for the European Parliament to consider the political agreement in a second reading. This will probably take place in the first half of 2005. If the Parliament agrees with the political agreement then this can go forward and the proposed Regulation can then become law. If, however, the Parliament wishes to make amendments to the Council's common position which the Council cannot accept then there will have to be negotiations between the two institutions in order to agree on a final outcome. The Commission with its technical knowledge can play an important role in facilitating agreement during this process.

REFERENCES

IPPC: IPCC Third Assessment Climate Change 2001. A report of the Intergovernmental Panel on Climate Change (http://www.ipcc.ch/pub/reports.html)

European Commission: Fluorinated Gases Working Group Report of the European Climate Change Programme

http://europa.eu.int/comm/enterprise/chemicals/sustdev/fluorgases/gas1.pdf

European Commission: Study on data reporting and marketing and use restrictions (2003);

Study on Containment measures (2003)

http://europa.eu.int/comm/environment/climat/eccp.htm

European Commission: COM (2003) 429 final of 11.08.2003.

http://europa.eu.int/comm/environment/climat/eccp.htm

Anon: Integrated Pollution Prevention and Control Directive – the BREF on the Non-Ferrous sector indicates SO_2 as the appropriate cover gas in magnesium die-casting.

(see: www.eippcb.jrc.es)