

MIPIGGS

F For Forgotten?

Why Potent Industrial Greenhouse Gases Deserve More Attention

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Executive Summary

Potent Industrial Greenhouse Gases or F-gases ('f' as they contain fluorine) are a rapidly growing threat, yet they have been largely ignored by the media and environment groups and are actually being promoted by UNEP and the US government in a perverse mis-application of the Montreal Protocol.

From over 650 internet searches across the professional, general, media and environmental sectors, this study found that 'F-gases' or 'PIGGS' (Potent Industrial Greenhouse Gases) occupied less than 1% of the total 'attention' devoted to greenhouse gases, whereas 'CO₂' scored 22% and 'carbon dioxide' 51%.

Of the 300-plus 'pressure groups' and environmental organisations campaigning on climate issues, the report finds fewer than ten - maybe only two or three groups - have run campaigns or done other work that could actually result in reduced pollution from these gases. There also seems to be no such group actively opposing F-gases or PIGGs in the USA.

The gases - HFCs, SF₆, and PFCs - are recent inventions currently present at low levels in the atmosphere. They do not directly affect the ozone layer but they are thousands of times more powerful than the main climate-changing gas, carbon dioxide. Estimates from a range of studies suggest HFC pollution may cause 7-13% as much global warming by 2050 as the main gas CO₂, and possibly more. This would more than overwhelm current commitments under the Kyoto Protocol. In 2001 the *Intergovernmental Panel on Climate Change* reported that HFC-134a concentrations are growing 'almost exponentially'.

Unique among pollutants that cause climate change, there is also a powerful industrial lobby favouring the deliberate production and use of HFCs - the fluorocarbon industry led by trade groups such as the *Alliance for Responsible Atmospheric Policy* and *European Partnership for Energy and the Environment* (EPEE). These groups are supported by companies such as Mitsui-Dupont, Daikin, Ineos (ex ICI), Solvay, Atofina, Ausimont, Rhodia and Toshiba. In its newsletter EPEE reveals its strategy is to 'promote HFCs as part of the solution to meet the environmental goals of climate change'.

The fluorocarbon industry openly links decisions on implementation of the Montreal Protocol to building the new market for HFCs. This report details eight major new HFC factories proposed or under construction in France, USA, Asia, UK and Spain, with others under construction in India and China. By contrast, the report also finds the Kyoto Protocol on climate protection has not stopped the construction of any HFC factory.

Public money (up to \$300m) continues to be used to subsidise the production and use of HFCs (and HCFCs) through the Montreal Protocol Multilateral Fund for developing nations, even though they are potent industrial greenhouse gases and these countries will soon face the need to cut greenhouse gas emissions. These gases are also often less effective and invariably more expensive than non-greenhouse gas alternatives, such as the patent-free hydrocarbons.

Extraordinarily, HFCs are actually promoted by the United Nations Environment Programme, and the US Environmental Protection Agency, as replacements for CFCs or HCFCs (ozone depleting substances). Even though HFCs are powerful greenhouse gases, in 2002 the US EPA awarded Stratospheric Ozone Awards to Honeywell and Daikin for manufacturing HFCs.

Taking a different approach several European nations such as Denmark, Austria, Switzerland, Luxembourg, Sweden and Norway have begun to ban HFCs and the other industrial gases, with phase-outs starting from this year. These countries promote 'Not In Kind' (not CFC, HCFC or HFC) technologies for air conditioning and refrigeration, such as 'greenfreeze' ammonia and hydrocarbon systems.

The fluorocarbon industry has succeeded however in dominating or 'capturing' the international (ISO), European (CEN/ CENELEC) and apparently the national (eg BSI) processes for setting industrial product standards, without which air conditioning, refrigeration and similar products cannot be sold. By packing relevant committees with its own representatives the fluorocarbon industry is seeking to fix standards in such a way that rival and environmentally better technologies are ruled out, even though government ministers may seem to promote them. To illustrate this failure of governance and democracy the report details the case of EN378, a draft standard about to be reconsidered at a crisis meeting in Switzerland on 6/7 June 2002. Drawn up by committees dominated by HFC makers and users, this standard would effectively prohibit 80% of the hydrocarbon-based (non-HFC) air conditioning systems (e.g. for offices) on the market.

Booming use of car air conditioning (up from 9% to around 80% in Germany for example in a decade) threatens to lock in massive levels of HFC use and is one of many instances where consumers are unaware that they are contributing to a major new cause of climate change. Even in 'improved' systems, car air conditioning kit leaks all of its HFC charge within 5 – 10 years.

Parties to the UN Framework Convention on Climate Change are due to discuss the conflict between the Kyoto Protocol and the Montreal Protocol at a SBSTA meeting in Bonn, 5 – 14 June 2002. The USA has rejected the Kyoto Protocol but in practice the global fluorocarbon industry's stranglehold over European standard setting processes effectively gives the USA a backdoor influence over European climate policy.

Analysis of UNEP's advice to developing and industrial countries on replacing CFCs and HCFCs shows a consistent bias in favour of HFCs and against alternatives. For example, in its *Ozone Action* newsletter and sectoral reports HFCs are described uncritically or approvingly with no warnings about global warming potential whereas routine safety measures needed to use rival technologies are elevated to the level of warnings that could deter use. UNEP also makes negative judgements about the viability of HFC rivals such as hydrocarbons.

F for Forgotten analyses the way in which UNEP and the US EPA have become the hub of a classic ‘epistemic’ community that is belief-centred, inward-looking and includes both the fluorocarbon industry and scientists working on their panels. With a shared mission to protect ozone but not climate this community believes in HFCs as a ‘solution’ not a problem. This psychological factor leads in turn to thinking that fluorocarbon industry descriptions of HFCs as ‘environmentally friendly’ or ‘benign’ are accurate or true and consequently to consumers, independent scientists and others being misled.

UNEP even manages a classic example of ‘framing’ (see www.frameworksinstitute.org) where unwelcome facts are discarded to retain the ‘frame’ (in this case HFCs are a solution), when it directly discusses the global warming potential of these gases. UNEP states ‘The most commonly used HFC is HFC134a, which has a relatively low¹ global warming potential of 1,300’ times more than CO₂).

To a significant degree the NGO community also sustains this basic misapprehension of the serious long-term threat to global climate problems posed by HFCs. Like UNEP, many environmentalists share a basic belief that the Montreal Protocol was the first significant and successful environmental treaty and neglect the scale to which the F-gas industry has turned its implementation to their own advantage. The result has been a failure to challenge the direct culpability of industrialists and politicians for greenhouse pollution by F-gases .

The significant inattention paid by NGO’s to F-gases must also reflect the long established scientific convention to express the total effect of warming by any gas (Global Warming Potential) in units of ‘carbon dioxide equivalent’. This convention has created a shorthand that has obscured the need to cut the net emissions and curb the effects of several other gases - methane, nitrous oxide and most notably HFCs. Recognition of this legacy is rising, but given the significance of language and measurement in the climate debate, it is time that carbon dioxide no longer be cast as the sole chief villain in the lexicon and demonology of climate change.

The battle to restrict the use of F-gases now requires significant effort on the part of the NGO community or the F-gas industry will consolidate its control of policy and standards relating to their products. In March this year EPEE hired the lavish Concert Noble ballroom restaurant in Brussels for a reception with over 100 consultants, lobbyists and politicians as part of a concerted lobbying exercise to oppose EU moves to phase-out F-gases / PIGGs. It retains the services of lobbying firm Hill & Knowlton.

F for Forgotten lists companies utilising non-HFC alternatives such as Coca Cola and Unilever but notes that without regulatory action to ban HFCs and promote alternatives, the domination of the fluorocarbon industry will continue and HFCs will become the new CFCs.

¹ Arguably they meant in comparison to other halocarbons but with zero GWP alternatives available the notion is nonsensical

RECOMMENDATIONS/ KEY FINDINGS

Governments

If the world is to head off F-gas pollution before it blossoms into another disaster on the scale of CFCs then governments need to intervene in order to:

- cap the production of each gas
- stop the construction of more factories to produce HFCs
- set phase-out dates
- require the systematic use of alternatives to HFCs
- enforce far tighter controls on PFCs and SF₆
- promote substitution technologies for all F-gases.

Standards

The chapter in *F For Forgotten* on standards was substantially published as a stand alone report at www.mipiggs.org in May 2002. Following that publication and resulting coverage in *ENDS Daily*, *European Voice* and *Environment Watch Europe*, it has become apparent that the European process for setting industrial product standards is outside effective political control or accountability. National politicians in Europe increasingly wish to consign the power to set standards to EU-level institutions but organisations such as CEN are controlled not by a political and publicly accountable process but by their national standards bodies, such as the British Standards Institute, which themselves are industry dominated. As a result standards are being left to the whims of the dominant industrial interests in each sphere, who (as in the case of refrigeration, see below) will not necessarily act in the public interest. In the USA, the decision to adopt HFCs as the CFC replacement in car air conditioning is attributed to the motor industry, not to independent agencies.

To rely on such a system to deliver environmental outcomes by delegating to them what was previously done by regulation, as the EU is currently proposing, is to court disaster.

Apart from the commercial issues that may be involved (for example around competition and restraint of trade), it seems self-evident that the environmental and public interest would in fact be best served if the committees, and certainly their mandates, were dominated and set by independent experts and public representatives. While it is clear that the industries must be involved, they ought not to be in control of the process.

- Governments need to establish effective democratic accountability in the standard setting process generally.
- This report recommends that the committees dealing with refrigeration and air conditioning are restructured and re-mandated to give a majority to independent and public interest representatives. They should also be given a new brief to avoid HFCs and to promote alternatives.

UNEP and Montreal Protocol

The most extraordinary feature of the whole F-gas or PIGGS picture is the way that the Montreal Protocol has been misapplied, so that it is now driving a significant part of the climate problem, in the guise of being 'environmentally friendly'. As the most famous

example of global environmental achievement, it is crucial for the credibility of international environmental policy that the Montreal Protocol be modified or differently applied so that it does not promote HFCs, directly or indirectly. *F for Forgotten* specifically proposes:

- The strategy of the Montreal Protocol be fundamentally updated to make it atmosphere-friendly rather than simply ozone friendly. This means working synergistically with the aims and objectives of the climate-friendly Kyoto Protocol, rather than antagonistically.
- The Montreal Protocol Parties should make global warming potential, and not just ozone depletion potential, a criterion for funding under the Multilateral Fund – at the moment climate-impact is not considered.

UNEP should:

- Put a prominent written health-warning on all its literature and web pages where HFCs are raised in the context of substitution for HCFCs or HFCs, pointing out that HFCs are very powerful global warming gases that cause climate change.
- Classify HFCs as transitional not long or medium term replacements for CFCs or HCFCs.
- Accept that HFCs are not a successful part of the Montreal Protocol but, at least now with abundant alternatives available, a failure.
- Acknowledge clearly that HFCs are developing into a rapidly growing climate problem and that the Montreal Protocol is a climate threat if run on HFCs.
- Stop using misleading terms like ‘ozone friendly’ and ‘environmentally safer’ if these are applied to climate-unfriendly and climate-dangerous chemicals such as CFCs or PFCs.
- Update all its literature to advise all users that they should follow its own policy of first replacing CFCs or HCFCs with NIK ‘Not In Kind’ substitutes and not with HFCs
- Stop referring to HFCs as ‘the preferred’ alternative.
- Make it clear that if industry prefers HFCs then it does not.
- Be non-judgemental about the prospects for uptake of alternatives such as hydrocarbons and ammonia.
- Stop raising safety measures as if they were arguments against ammonia or hydrocarbons.
- Orient MLF expenditure, policies and advice to help developing countries move towards the Danish, Austrian, German model (phasing out HFCs) rather than the American model of HFC promotion and usage.
- Promote NIK climate-friendly alternatives that do not use greenhouse gases.

NGOs/ Pressure groups

F for Forgotten notes that it is worrying if non governmental organisations (NGOs) share the view of the chemical industry and UNEP, who see HFCs in a positive light.

A generation in the environment movement ‘cut their teeth’ on save-the-ozone campaigns and regarded it both as a problem solved and a victory to be celebrated. In the lexicon of environmental ‘achievements’ the Montreal Protocol has almost sacral status. Nevertheless, it is now essential that HFCs are subject to a rapid phase-out and are not allowed to grow into a major problem through a mis-application of the Montreal Protocol.

Given the increasing success of their arguments on carbon dioxide and fossil fuels – not yet translated into action in the United States but making progress in many other countries – it is timely for NGOs to consider some additional attention to F-gases before they become an even greater problem.

F for Forgotten recommends that NGOs devote significantly greater attention to policies and measures concerned with reducing and eliminating the production and emissions of PIGGs/ F-Gases, and to ensuring the uptake of alternative technologies which do not entail the use of F-gases.

Principle Issues raised by F gases

- Political and corporate (social) responsibility
- A missed opportunity to restrict or control global warming
- The undermining of ‘sustainable development’ policies
- A failure to apply known environmental solutions
- Consumers being denied environmentally sound choices

A gross failure of political and corporate responsibility

In terms of both ‘Corporate Social Responsibility’ and direct political responsibility, industrialists and politicians are far more directly culpable for greenhouse pollution by F-gases than for greenhouse gases as a whole. These substances are *deliberately* produced, and in the vast majority of cases there are available alternatives so allowing (or promoting) their use is a deliberate political act which will lead to climate pollution.

The example of Denmark and the other countries moving towards a phase-out, shows what can be done. Unlike, say, nitrous oxide or even methane, it cannot be more convincingly argued that not all solutions are known or that some sources are very hard if not impossible to control.

For HFCs in particular, the issues raised are almost identical to those raised around CFCs and HCFCs. The actors from the chemical industry are very much the same companies, their arguments and their markets are almost the same. The most significant political difference is that several governments have moved or spoken against HFCs (for example Denmark, Austria, Luxembourg, and Switzerland), while the United States is the major supporter of HFCs – the opposite case to CFCs where for some time the USA wanted tougher controls than European nations.

The chemical industry actively promotes the use of HFCs, and is investing very heavily in new HFC production plant. It is perhaps the only example of an industry being permitted to actually construct machinery for the specific purpose of producing greenhouse gases, which will not be recovered. Even more remarkable is the celebration of this by the USEPA, with prizes for producing HFCs.

Subversion of standards – A failure of governance and democracy

The setting of industrial standards is well beyond effective political accountability or control. This has allowed dominant industrial interests to use the process to their own advantage rather than to the public interest. The chemical industry has scored a remarkable success in achieving almost complete dominance of the standards system for refrigeration and cooling, thereby acting as its own governing body. This is clearly an abuse of the public interest and an example of the undermining of governance at a national and supra-national level. Moves towards more industrial self-regulation, as currently proposed in the EU for example, can only make this problem worse.

It is also an example of the abuse of ‘science’ and the standing of ‘experts’, (see recent critique by Tudge¹) showing clearly how politicians have abrogated responsibility to supposedly technical and impartial bodies which are in fact dominated by just one industrial interest. Relevant parts of the standards system (eg air conditioning and refrigeration) should be revised, with a mandate to avoid greenhouse gases, and committees should be re-structured with a built in majority of independent experts and public interest representatives.

Given this is a process that occurs through the operation of obscure ‘technical committees’, it has remained outside the domain of public campaigns, and beyond the public gaze. It has not been subject to any effective work by NGOs or scrutiny by the press.

Missing an opportunity to restrict global warming

F-gases are receiving some attention from governments and rather less from environmental groups, but this attention is not commensurate with the threat that they pose, or are likely to pose if production is permitted to increase unchecked. Urgent action is required if F-gases are not to slip through the fingers of the international control system being set up to combat climate change.

Right now, HFCs are becoming the new CFCs with major new sectors being opened up, such as air conditioning for cars. The enormous potency and often long lifetimes of these gases mean the future impact of all PIGGs could be very considerable and could easily overwhelm the limited greenhouse gas reductions already negotiated.

Consumers misinformed and badly served

F-gases are not obvious – they are largely ‘stealth gases’. The public is largely unaware of their existence and these gases are often invisible to consumers within products or may even be disguised by ‘green labelling’. For example

- HFCs in spray cans or foam may be described as ‘ozone friendly’.
- Domestic fridges may be labelled ‘ozone friendly’ and have a prominent energy rating label but no mention of HFCs, whether they contain them or not.
- Shop staff usually have no training in what HFCs or the alternatives are.
- European consumers are buying air-conditioned cars in increasingly large numbers (80% of the new cars in Germany for example) and those who are ‘environmentally sensitive’ may check fuel economy figures while not realising that the air conditioning is leaking HFCs.
- PFCs are mainly emitted in the production of electronic goods such as computers or mobile telephones. As such they are part of the ecological ‘footprint’ or ‘rucksack’ of these products but are emitted before the consumer makes the purchase.

- SF₆ is used in electrical insulation and in some cases at least could be replaced by air insulation if equipment was designed differently. Such a shift is not easy for the public to influence.
- Because a CE mark is by law required for sale of a product in the EU, European consumers will be denied true alternatives if new standards are adopted (see full report Section 5) which effectively rule out alternatives to HFCs

Unsustainable Development

Due to the wide range of ‘not in kind alternatives’ now established in the market, HFCs fall down on the sustainability criterion of ‘need’. Additionally, the effect of ‘standards capture’ by the f-gas industry is not simply to allow a polluting practice to continue but to write it into standards which are then issued to industry, commerce and the public. This is the antithesis of sustainability.

The way UNEP and some governments have treated the HFC issue – promoting a pollutant in collaboration with the largest players of industry while playing down alternatives - demonstrates emptiness of much government rhetoric on sustainability. Here industry is actually manufacturing greenhouse gases - not just producing them as a side effect from e.g. fossil fuels, fertiliser or garbage – and claiming to do so as part of ‘the climate solution’. This is particularly poignant given the rhetoric that will no doubt flow from the same sources at the forthcoming Earth Summit in Johannesburg.

Politicians need to give new instructions to the Montreal Protocol. Developing countries in particular will suffer from increased reliance on HFCs: They are less dependable than alternatives, more costly, are patented rather than patent-free, and will incur future greenhouse reduction burdens at the time when developing countries start to enforce such reductions.

Solutions Neglected

This issue is a clear example of solutions left on the shelf. It is an *avoidable* problem. Engineering and technological solutions, alternatives to F-gases are not being mandated or required by UNEP or many governments, most notably the USA. There is a wide range of commercially available alternatives to HFCs in particular. The ‘Not In Kind’ refrigeration and air conditioning sector is one of the best researched for environmentally better solutions.

However without regulation and promotion of alternatives, the structural advantages of the established fluorocarbon industry will ensure that the worst and most damaging choices will continue to predominate.

In its *Third Assessment Report, 2001, Climate Change: The Scientific Basis* IPCC says:

‘The perfluorocarbons (PFCs, e.g., CF₄ and C₂F₆) and sulphur hexafluoride (SF₆) have anthropogenic sources, have extremely long atmospheric residence times, and are strong absorbers of infrared radiation. Therefore, these compounds, even with relatively small emissions, have the potential to influence climate far into the future. Perfluoromethane (CF₄) resides in the atmosphere for at least 50,000 years. It has a natural background; however, current anthropogenic emissions exceed natural ones by a factor of 1,000 or more and are responsible for the observed increase. Sulphur hexafluoride (SF₆) is 22,200 times more effective a greenhouse gas than CO₂ on a per-kg basis. The current atmospheric concentrations are very small (4.2 ppt), but have a significant growth rate (0.24 ppt/yr).

and

'HFC-134a is used primarily as a refrigerant, especially in car air-conditioners. It has an atmospheric lifetime of 13.8 years, and its annual emissions have grown from near zero in 1990 to an estimated 0.032 Tg/yr in 1996.. The abundance continues to rise almost exponentially as the use of this HFC increases'.

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A founder of www.mipiggs.org, his interest in climate issues goes back to work for Greenpeace International before the 1988 *Toronto Conference on the Changing Atmosphere*, after which he founded the Climate Action Network, with two colleagues. For several years he edited ECO magazine at the climate negotiations, and has published other reports on climate issues such as *Can Nature Survive Global Warming ?* (WWF International 1992).

Whilst at Greenpeace UK he oversaw the campaign programme including work to develop a prototype HFC-free fridge, a 'supermarket greenfreeze' system, and campaigns on CFC and HCFCs and avoiding HFCs in their phase-out. He took the greenfreeze fridge prototype to the 1992 Copenhagen meeting of the Montreal Protocol.

In 1995 he helped lead the Brent Spar campaign against Shell's plan to dump the Brent Spar oil installation at sea, and wrote a book about it *The Turning Of the Spar* (1998). He devised the carbon-logic based oil frontier campaign model, developed by Greenpeace in the Atlantic, Alaska and Australia.

In 2001 he started Families Against Bush, an organisation enabling consumers to shop with brands that oppose the Bush climate stance on Kyoto, at www.fabclimate.org.

He has published scientific papers, many articles, several books and has worked for WWF International and Friends of the Earth. He was formerly a research ecologist. He founded the London Wildlife Trust, British Association of Nature Conservationists and Media Natura. He is currently writing a book on campaigning for Earthscan/Kogan Page, due to be published in 2003.

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ⁱ Colin Tudge, Mad, bad and dangerous, *New Statesman* 4 March 2002