Climate bombs called HFCs

How the industry lobby is trying to block a phase-out of super greenhouse gases in Europe's refrigeration and air conditioning systems

Corporate Europe Observatory – September 2012

Summary

An army of several hundred industry lobbyists, many representing Japanese and North American corporations, has quietly laid siege to Brussels in an effort to persuade the European Union (EU) not to ban powerful greenhouse gases known as hydrofluorocarbons (HFCs) present in Europe's refrigeration and air conditioning systems.

Representing more than one hundred companies and industry groups, up to 353 industry advocates are trying to block these proposals, far outnumbering voices from environmental campaign groups and other sectors of the industry which do not rely on these harmful gases.

In Europe the €30-billion fluorinated gases (F-gas) industry – of which HFCs represent 90% of F-gas use – produces air conditioning equipment, components, cooling systems, heat pumps, foam blowers, electrical switches, and refrigerant chemicals. Now the F-gas industry is attempting to influence a European regulatory review process to prevent a pioneering switch to cost-effective, safe alternatives which are already – or soon will be – available on the market.

Often overlooked, these F-gases are crucial when it comes to tackling climate change. HFCs have a global warming potential often thousands of times higher than CO_2 and are one of the fastest growing sources of greenhouse gas emissions in the world. By 2050 estimates suggest they could account for up to 20% of projected global greenhouse gas emissions unless action is taken.

European policy makers now recognise the need to shift to a low-carbon economy by fostering innovation here in Europe. The F-gas regulatory review process not only offers enormously cost-effective and significant mitigation opportunities but it is a chance for Europe to innovate and develop technology on home ground.

Research by Corporate Europe Observatory (CEO), based on data provided in the EU Transparency Register (a register of companies and organisations which have voluntarily declared that they are seeking to influence the European Commission or Parliament), found a significant increase in the number of registered companies and trade associations with an interest in F-gases at the end of 2011.

CEO found that 52% of these industry bodies registered during the last quarter of 2011. For example, in the first two weeks of November, 14 European subsidiaries of the Japanese air conditioning giant Daikin appeared on the official Brussels lobby map. Given that the register is voluntary, it is only a rough barometer of major EU lobbying trends and these findings may represent just the tip of the iceberg. This lobbying frenzy is because HFC manufacturers own

profitable patents on these man-made gases, which face potential regulation by the European Commission.

The lobby battle is currently raging in the corridors of power in Brussels. In early September the European Commission's DG Climate Action submitted new legislative proposals on HFCs to inter-services consultation. This means that formal talks have started between the different Directorates-General of the Commission on the proposals from DG Climate Action – a crucial phase before the legislative proposals are finalised and launched by the Commission, probably in late November.

A handful of public interest NGOs are calling on the Commission to ban the use of these super greenhouse gases in new equipment – a measure recommended by several independent studies and an approach already taken by some member states, including Denmark and Austria. But the task of NGOs is not easy, and demonstrates the imbalance at the heart of public policy making.

Out of the 111 F-gas industry organisations identified by this research, 100 are registered in the Transparency Register and have declared a total lobbying budget of €23.9 million. In contrast, eight organisations representing environmental interests and active on F-gas issues declared €2.2 million in total for all their advocacy activities, while eight companies or platforms supporting natural refrigerants declared only €0.9 million.

Taking into account both the number of lobbyists and lobbying budgets, the F-gas industry has on average a lobbying power at least 10 times greater than the combined efforts of the NGOs and the industry that supports natural refrigerants. This "David and Goliath" situation is not unique to the issue of HFCs. However with media attention focused on less technically complex issues associated with climate change, the fear is that F-gas industry interests may permeate into European policy-making, at the cost of the climate, with little public awareness.

Some parts of the F-gas industry are lobbying to keep the current Regulation, while more progressive elements are pushing for a gradual phase-down of the use of HFCs. Environmentalists want to see supporting actions to ensure HFC use is curtailed. These include the use of HFC bans in sectors where viable alternatives will become available. Using a phase-down approach on its own would not only keep the EU market open to the HFCs and equipment using HFCs far longer than necessary, but it would also create market uncertainty for the companies providing sustainable alternatives which require clear timeframes for planning and investment purposes.

Today, European Union taxpayers and consumers spend over €1 billion a year to contain leaks of F-gases and to recover these gases at the end of the equipment life, and these costs will increase over time, according to a Commission-funded study. These costs are already twice as much as predicted by an independent study in 2005. This containment and recovery strategy is at the core of the F-Gas Regulation adopted by the EU in 2006 – and this is boasted as a victory to avoid bans by the HFC lobby.

The Commission's proposal to review the F-Gas Regulation must be ambitious from the start because it will later frame the debates in the Parliament and the Council. An ambitious EU regulation could also facilitate and drive international talks under the Montreal Protocol that could regulate HFC consumption and production at the global level. This is particularly important as in the years and decades to come most HFC emissions will come from the developing world.

Since summer 2011, it seems as if special instructions have been circulating in hydrofluorocarbon (HFC) industry circles, asking trade associations and companies to join the European Union (EU) Transparency Register ahead of a key lobbying battle on the climate front. A tactical move by HFC industry lobbyists to get 'credibility', a Brussels-based lobbyist from the Japanese air conditioning giant Daikin told the Belgian press[1].

The register was created by the European Commission four years ago to keep track of interest groups that lobby EU institutions. It is an imperfect tool, mainly because it is voluntary by nature and not properly audited by the Commission[2]. But, if used with caution, it can still serve as a rough barometer of major EU lobbying trends.

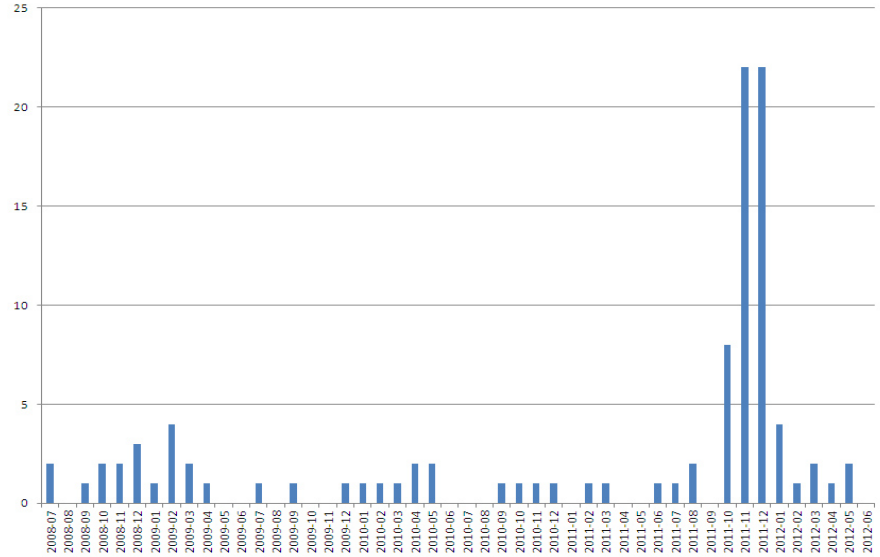
In this case the trend concerns the battle to avoid a ban on HFCs, powerful greenhouse gases (GHGs) present in refrigerators, foams and air conditioning systems. HFCs are fluorinated gases (F-gases) which have a global warming potential (GWP) often thousands of times higher than carbon dioxide (CO_2)[3] and today are one of the fastest growing source of GHG emissions in the world[4] (see Box 1).

HFC emissions today are unnecessarily high and, as the phase-out of their ozone depleting predecessors continues, are set to rocket in coming years. In June 2009, Achim Steiner, the head of the United Nations Environment Programme, described HFCs as the "low-hanging fruit in the climate change challenge"[5]. He added that "by some estimates, action to freeze and then reduce this group of gases could buy the world the equivalent of a decade's worth of CO_2 emissions".

Despite the climate imperative to transition to a low-carbon economy, industry is now fighting to continue using these climate-harming gases and prevent the adoption of cost-effective, safe alternatives. The HFC lobby has let it be known in advance of the current review of the F-Gas Regulation adopted by the EU in 2006 that it will not yield to climate-friendly alternatives without a fight (see Appendix 1 for a 2000-2012 timeline of the adoption and review processes of the F-Gas Regulation).

Data from the Transparency Register shows that 52% of companies and trade associations with an interest in F-gases listed on the register actually joined the register at the end of last year (see Appendix 2). Figure 1 shows monthly registrations of F-Gas Regulation industry stakeholders. This spiked during the last quarter of 2011 with an army of 19 trade associations and 33 companies from all over Europe subscribing in what appears to be a concerted effort to influence EU institutions, in particular the European Commission. Between 2-18 November for instance, 14 European subsidiaries of Daikin joined the register.

Figure 1 – Monthly registrations of F-Gas Regulation industry stakeholders since the EU Transparency Register was launched (July 2008 – June 2012)



Box 1 | **What are HFCs and how are they regulated in the EU?**

Fluorinated gases or F-gases are super greenhouse gases containing fluorine (F), including hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6). The most common type of F-gases are HFCs, which were created by the chemical industry to replace ozone-depleting chlorofluorocarbons (CFCs) and hydrofluorocarbons (HCFCs) banned by the Montreal Protocol.

HFCs have a global warming potential (GWP) ranging from 4 to 14,800. GWP is a relative measure of how much heat a greenhouse gas traps in the atmosphere. It compares the amount of heat trapped by a given gas to the amount of heat trapped by a similar mass of CO_2 over a specific time interval (20, 100 or 500 years). For instance HFC-134a, the most widely-used HFC, has a GWP of 1,430 over a 100-year lifetime. During this period it will be 1,430 times more harmful to the climate than a similar mass of CO_2. This is why Greenpeace has dubbed HFCs and other F-gases "the worst greenhouse gases you've never heard of"[6].

HFCs are primarily used in refrigeration and air conditioning, with these sectors accounting for 90% of all F-gas use[7]. Other areas where HFCs are also used include fire protection systems, solvents, and aerosols. In short, HFCs are virtually everywhere – homes, offices, schools, factories, warehouses, vehicles...

HFC emissions can happen in three ways: (i) when HFCs are manufactured; (ii) through leakage from equipment sold on the market; and (iii) when equipment is discarded at the end of its life. Officially HFCs and other F-gases contribute around 2% of EU greenhouse gas emissions today[8]. But this figure is very likely underestimated because of unreported leaks (f.i., Western Europe's emissions of HFC-23 are 60-140% higher than officially reported)[9]. Unless changes are made, global HFC emissions are predicted to balloon to 9%-19% of global GHG emissions by 2050[10].

Cost-effective alternatives to HFCs exist, including natural refrigerants such as ammonia, propane, butane and even CO_2[11]. Whilst there are hazards associated with using some of these substances, experience has shown that good engineering and due diligence can ensure their safe usage in society. The German Federal Environment Agency (UBA) recently identified available alternatives in the seven HFC sectors (see Appendix 3 for details). HFCs are covered under the Kyoto Protocol, which commits the EU to reducing its GHG emissions by 8% between 2008 and 2012 compared to 1990 levels[12]. To constrain the use of HFCs, the EU adopted two pieces of legislation in May 2006:

- Regulation (EC) N° 842/2006[13]. The "F-Gas Regulation" covers air conditioning systems, industrial refrigeration and other mostly "stationary" industrial applications. Domestic fridges were excluded. Obligations covered the containment of leakages, recovery of used equipment, labelling of products, reporting of emissions data, and a ban on the use of some F-gases in small subsectors that did not have a strong lobby (footwear, tyres, fire extinguishers...).

- Directive 2006/40/EC[14]. The "MAC Directive" is meant to phase out HFCs present in "mobile" air conditioning (MAC) systems in cars and small vans. It covers around 30% of current HFC emissions. The MAC Directive bans gases with a GWP of more than 150 for new models since 2011, and for all new cars produced from 2017. This legislation essentially bans HFC-134a and is leading an industry-wide shift to a less-damaging but still controversial[15] HFC called 1234yf with a GWP of 4[16].

The F-Gas Regulation is currently under review by the European Commission, which is expected to table a proposal end of 2012. The European Parliament and the Council will then have the opportunity to consider and amend it.

Combined with the F-gas industry stakeholders already registered or known but unregistered, this makes a total of 111 industry stakeholders (53 companies and 58 European or national trade associations) with a strong interest in the current review of the F-Gas Regulation. On the other side, only eight environmental NGOs and eight industry groups or companies promoting alternatives to F-gases were found to be active on this issue (see Tables 1 and 2).

All these stakeholders were identified by combining:

- the stakeholders represented in the Expert Group on Fluorinated Gases set up by the European Commission in October 2010 to get advice for the review of the F-Gas Regulation[17];
- the participants to a so-called 'stakeholders meeting' on the review of the F-Gas Regulation held on 13 February 2012 in Brussels[18];
- key members of the European Partnership for Energy and the Environment (EPEE), the main industry lobby group on HFCs[19]; and
- other interested organisations or companies present on the Transparency Register and found through specific keyword searches, such as 'F-gas', 'HFC' or 'refrigerant'.

Out of the 111 F-gas industry organisations identified by this research, 100 are registered in the Transparency Register and have declared a total lobbying budget of €23.9 million. In contrast, the eight organisations representing environmental interests and active on F-gases declared €2.2 million in total for their advocacy activities, while the eight companies or platforms supporting natural refrigerants declared €0.9 million.

Assuming that all these stakeholders spent the same proportion of their budgets lobbying on HFCs, the NGOs would have one eleventh of the spending power of the HFC lobby and the companies or platforms supporting natural refrigerants would have one twenty-sixth of that spending power (see Table 1). Taking into account the estimated number of lobbyists, and assuming all stakeholders dedicated the same percentage of their lobbying staff solely to HFCs, there would be 29 HFC industry lobbyists for each civil society representative, and 24 HFC industry lobbyists for each industry lobbyist supporting natural refrigerants.

Taking into account both the number of lobbyists and lobbying budgets, the HFC industry has on average a lobbying power more than 10 times higher than NGO and industry promoting natural refrigerants taken together.

Table 1 – Imbalance between HFC industry and environmental interests on the F-Gas Regulation review

	HFC industry (IND)	Public interest NGOs	Alternative industry* (ALT)	Ratio IND: NGO	Ratio IND: ALT	Ratio IND: ALT+NGO
Stakeholders	111	8	8	14:1	14:1	7:1
Lobbyists (declared)	4923	161	10	31:1	492:1	29:1
Lobbyists (adjusted)**	353	12	15	29:1	24:1	13:1
Lobbying budget (€M)	23.9	2.2	0.9	11:1	26:1	8:1

* Industry significantly supporting natural refrigerants.
** The number of lobbyists declared has been adjusted because (i) several registered entities seem to have declared the number of their employees rather than their lobbyists; (ii) there are some big discrepancies between the number of lobbyists and the lobbying budget declared. For instance, Tecumseh Europe declares 1,350 lobbyists and the Japan Business Council in Europe 250 lobbyists, both for a lobbying budget of less than €50,000; Daikin AC Spain declares 256 lobbyists for a €0 budget, etc. In those cases the number of lobbyists declared has been adjusted to the conservative value of 1 unless there was indication otherwise (for instance Mitsubishi Electric Air Conditioning Systems Europe Ltd. declared 450 lobbyists, a figure which was adjusted to two because the list of participants to the February 2012 stakeholders meeting mentioned two lobbyists from this company). Source data are reproduced in Appendix 2 (a spreadsheet is also available online: http://bit.ly/EU_F-Gas_lobby).

The reality, however, is likely to be even more unbalanced for two reasons. First, several studies by the Alliance for Lobbying Transparency and Ethics Regulation (ALTER-EU), a coalition of over 200 public interest groups, trade unions, academics and public affairs firms, have repeatedly shown that there is widespread under-reporting of lobby expenses by industry (firms and associations)[20]. Many of those who are the biggest spenders on EU lobbying, according to the register, are in fact very minor players or may not even be lobbying at all; law firms continue to evade disclosure; and many registrants have taken a very lax approach to the accuracy, quantity and quality of their declarations.

Secondly, only a small fraction of civil society organisations' overall lobbying budgets is actually used for lobbying on HFCs[21] – which is just one of a large number of environmental issues they advocate on. Conversations with civil society organisations indeed reveal that only 12 civil-society representatives are active on HFCs in any capacity at the EU level, the vast majority of them on only a part-time or ad hoc basis.

On the other hand, a number of companies or industry platforms declare that they are working exclusively on the F-Gas Regulation issue, such as the French institute Cemafroid (42 lobbyists declared)[22], the European Association for the Responsible Use of HFCs in Fire Protection (ASSURE, four lobbyists)[23], the American refrigerator manufacturer Westye Group (three lobbyists)[24], Mexichem UK (one lobbyist)[25], or the French Cooling Association (600 lobbyists declared, which is assumed to be a mistake)[26].

The companies or industry platforms also work on other EU policies that may affect their business, but according to data from the Transparency Register the number of these policies appears to be smaller than the number of environmental policies covered by environmental NGOs. As a result, compared to civil society's lobbying forces, proportionally a bigger part of the HFC industry's lobbying forces can be directed towards the review of the F-Gas Regulation.

The number of in-house lobbyists working for the HFC industry is estimated to be 353, with 168 from individual companies, 100 from European trade associations, and 85 from national trade associations (see Table 2). The respective lobbying budgets as declared in the Transparency Register are €9.9 million (companies), €8.4 million (European trade associations), and €5.6 million (national trade associations).

Table 2 – The European F-gas industry lobby, its lobbyists, and its lobbying budget*

		Stakeholders	Lobbyists (adjusted)	Lobbying budget (€M)
Trade associations	European	31	100	8.4
	National	27	85	5.6
	Subtotal	58	185	14
Companies		53	168	9.9
Total		**111**	**353**	**23.9**

*These figures are gross estimates that do not include (i) in-house lobbyists from companies and industry associations that did not attend the stakeholders meeting, were not part of the expert group on F-gases, are not members of EPEE, or did not subscribe to the EU lobby register; and (ii) the number of external for-hire lobbyists from consultancies and PR firms paid by F-gas industry stakeholders to lobby on their behalf (for instance, at least four lobbying and PR firm employees attended the February stakeholders meeting, but it is not known whose interests they were there to represent).

Why are these F-gas industry lobbyists flexing their muscles in Brussels?

The Westye Group, an American company selling top-of-the-range refrigerators in Europe, is one of the 33 companies and 19 trade associations that joined the Transparency Register during the last quarter of 2011. It is the sole registered entity that openly and explicitly declared why it has three lobbyists: "We are concerned of the business effect of a possible ban in the EU on refrigeration products that use hydrofluorocarbon (HFC) refrigerants[27]."

Like many companies manufacturing products using HFCs as refrigerants – i.e. companies producing air conditioning equipment, components, refrigeration systems or heat pumps – the Westye Group does not want the costs associated with changing production lines to natural refrigerants.

Screenshot from the EU Transparency Register for the Westye Group's entry.

Similarly it would seem likely that big HFC manufacturers (Honeywell, DuPont, Arkema, Solvay, Mexichem) want to continue to selling their products for which they own very profitable patents. For instance DuPont de Nemours owns patents on the ISCEON® 9 Series refrigerants, "a complete family of easy-to-use, non-ozone-depleting hydrofluorocarbon (HFC) retrofit refrigerant blends", as well as on Suva® HFC refrigerants[28]. These HFCs are widely used in the EU today[29].

Equipment using HFCs must be refilled periodically with the same patented chemicals, as a result of leakage. This provides a steady revenue stream for HFC manufacturers that own these patents for decades into the future, long after the equipment is sold. Their objective is therefore to keep the European market open at all costs to new equipment designed to use HFCs.

These companies – manufacturers and users of HFCs – and their lobbyists claim that a wider ban on HFCs would cost Europe's businesses hundreds of millions of euro and create job losses. Their first choice would be continued reliance on containment and recovery but, if something must be done, the next-best option according to them would be a slow phase-down that would extend many years into the future. To pass on this message to the EU institutions Daikin alone has up to 50 registered in-house lobbyists (see Box 2).

Box 2 | **How Daikin's 50 lobbyists will "reduce global warming" with HFCs**

Daikin is not only the second largest manufacturer of heating, ventilation and air-conditioning systems in the world but it also manufactures and sells HFCs. In 1997, the Japanese giant entered a patent cross licensing agreement with US chemical company DuPont de Nemours for new refrigerants such as HFC-32, an HFC with a global warming potential (GWP) of 675 over 100 years – but of 2,330 over 20 years, which shows how damaging this gas is in the short term[30]. Daikin has manufactured HFC-32 in its own chemical plants since 1999[31].

Whilst environmentalists believe HFC-32 has an unnecessarily high GWP when compared to alternatives such as CO_2 and hydrocarbons, Daikin is keen to promote this HFC as an acceptable alternative to currently popular HFCs. On its website, the Japanese giant even claims that "HFC-32 has the potential to significantly reduce global warming"[32].

Fourteen European subsidiaries of the Japanese air conditioning giant Daikin joined the EU Transparency Register between 2-18 November 2011. Overall the company had 49.5 lobbyists registered at the end of 2011 (see Appendix 2). This move suggests that Daikin is using all of its corporate lobbying muscle to ensure that any changes to Europe's F-Gas Regulation would favour its equipment and the HFCs it manufactures.

Commission-funded and independent analyses support bans

Environmental NGOs say that climate-friendlier and safe alternatives to HFCs can fully satisfy market demand for new equipment while providing equal or greater energy efficiency than HFC-based equipment in almost all industry subsectors by 2015-2020[33]. They are therefore calling on the Commission to implement new bans, pointing to recent Commission-funded and independent analyses[34].

For instance, a study published in June 2012 by the German Federal Environment Agency (UBA) showed that HFCs can easily be replaced by ammonia, CO_2, or a mix of ammonia and CO_2, in all industrial refrigeration subsectors (food processing, chemical/pharmaceutical, cold stores, sports and leisure facilities, metal industry, and industrial heat pumps)[35].

This UBA study confirmed a report by the Commission itself, published in September 2011, which found that alternatives to HFC-technologies "are today technically feasible in most relevant fields of application" and "have the potential to gradually replace technologies based on F-gases with high GWP, thereby contributing to a cost-effective transition to a climate-friendly, low-carbon economy"[36].

With regard to energy efficiency, the Commission also found that "[i]n energy-consuming applications such as refrigeration, air conditioning and heat pumps and in energy-preserving applications such as building and appliance insulation foams, low-GWP technologies can potentially achieve an equivalent performance in most cases"[37]. This conclusion contradicts the mantra of EPEE's lobbyists that "[i]ndustry should not be rushed into using new technologies as this may turn out to be counter-productive for energy efficiency and the climate"[38].

Public interest NGOs also point as evidence to the action by Denmark and Austria where many of these super greenhouse gases have been banned from new equipment[39]. Indeed, the Commission recently approved the Danish government's bans, showing the feasibility of such an approach[40]. NGOs have also raised the urgency of the climate situation.

Why the F-Gas Regulation is ineffective and costs EU taxpayers over €1 billion a year

A recent Commission-funded study showed that the current F-Gas Regulation suffers from implementation, enforcement, and compliance issues[41]. The researchers found "only little evidence" of the effectiveness of containment and recovery measures, which were put forward as a solution by the HFC lobby when the F-Gas Regulation was first adopted in 2006.

Taxpayers and consumers in the European Union currently spend over €1 billion a year to contain and recover HFCs[42] – twice as much as predicted by an independent study in 2005[43]. And these costs will increase over time. This situation results from intense lobbying carried on by the European Partnership for Energy and the Environment (EPEE) – the leading HFC industry lobby group – in the early 2000s when the F-Gas Regulation was conceived.

One important reason why the F-Gas Regulation has not been properly enforced "is because it was so heavily compromised by industry during the [legislative] process", according to Client Earth, an environmental NGO that used to follow the F-gas issue[44]. "You have ambiguous prohibitions that are sometimes hard to decipher, you don't have cost thresholds set, and you've got exemptions".

Back in 2005 Corporate Europe Observatory (CEO) exposed how EPEE and the HFC industry lobby had undermined the scope and ambition of the F-Gas Regulation[45] (see Box 3). Coordinated by PR firm Hill & Knowlton, the lobbying was so aggressive that it was dubbed as "scaremongering"[46].

Today, EPEE still takes pride in its lobbying success: "EPEE helped avoiding a ban on F-gases by moving the focus to containment provisions", boasts the lobby group's website (see below)[47]. Rather than focusing on outright bans, the F-Gas Regulation focused mainly on "containment and recovery" measures – that is to say, preventing and minimising leakage, and capturing and destroying HFCs when the equipment and foams reach the end of their lifetime. It means that the lucrative European marketplace remained open to HFCs. That was exactly what EPEE was fighting for.

Screenshot of EPEE's website (September 2012).

The interest of the HFC producers to "avoid a ban" is still obvious today: they still own patents on HFCs while they cannot profit as much from natural refrigerants, which are unpatentable. Some manufacturers of equipment using HFCs are also reluctant to adapt their products – and thus their production lines – to natural refrigerants. They prefer to continue with business as usual while the legislative future for HFCs is still unclear.

Indeed no company wants to move first in incorporating new environmentally sound technologies, because they think they would run the risk of pricing themselves out of the market. This situation highlights the need for legislation with tight timelines and targets which create a level playing field for all.

Box 3 | **EPEE: a long track record of lobbying against the climate**

In the late 1990s, US multinationals like DuPont and Honeywell were determined not to give up their globally expanding HFC business in spite of increasing criticism that these gases contribute seriously to global warming. Their lobby groups in Washington, the Air conditioning and Refrigeration Institute (ARI)[48] and the Alliance for Responsible Atmospheric Policy (ARAP), decided to use the Transatlantic Business Dialogue (TABD) – a body set up in 1995 by the European Commission and the US government to coordinate transatlantic corporate lobbying – as a platform to oppose F-gas bans by individual EU member states.

At a TABD summit in Cincinatti in December 2000, the TABD Refrigerants Group "briefed Peter Horrocks, the EU's Environment Head of Sector, and Gerhard Lohan, the EU's Enterprise Head of Unit, for nearly two hours on the merits of long-term HFC use"[49]. This privileged access offered by the TABD to the HFC industry influenced key concepts in the first Commission F-gas proposal.

The TABD also played an important role in paving the way for a European twin organisation to ARAP. In 2000, ARI founded the European Partnership for Energy and the Environment (EPEE) and hired public affairs company Hill & Knowlton to run EPEE's lobbying campaign. ARAP was founded in 1980 to defend the interests of CFC producers that strongly opposed the ban of CFCs[50]. Now, ARAP and EPEE fiercely promote F-gases for their non-ozone depleting qualities, while downplaying their global warming impact.

In 2003 the original European Commission proposal reflected both the privileged access that the F-gas industry had to the Commission before the drafting process started, and industry's dominating voice within the working group on fluorinated gases set up by the Commission to get advice on policy options.

In the final phase of the second reading at the European Parliament, when it was clear that the Parliament and the Council would not reach a compromise on the Regulation and that a so-called 'Conciliation committee' would need to be convened for trialogue meetings[51], EPEE targeted Members of the Parliament (MEPs), the Commission and member states in an ultimate attempt to prevent additional bans on F-gases proposed by the Environment Committee of the Parliament.

Leaked EPEE documents revealed by CEO in October 2005 gave a unique insight into this multi-faceted lobbying offensive orchestrated by Hill & Knowlton. The PR firm set up a list with "input against each ban" that could be decided and this list of arguments was the basis of all lobbying by EPEE members. It also organised meetings with critical MEPs to "influence the voting list across the political group and national delegations positions", and looked for "friends" in the Environment Committee to "put doubt on results on critical bans and legal base amendments and carry the message to wider parliament".

To influence the Commission, Hill & Knowlton contacted the Cabinets of Stavros Dimas (Environment) and Jose Manuel Barroso (President) to "ensure steady on legal base". "NC" – presumably Nick Campbell from Atofina Total, EFCTC, and CEFIC – was to talk to DG Environment, and there was "ongoing contact with DG Enterprise".

At member state level, EPEE said it would "ensure favourable national governments more active in briefing". These "favourable" national governments would be "pushed" to "brief national MEPs ahead of plenary vote to ensure fully informed and well thought out vote". Notably, the last-minute strategy of EPEE was to put its own words in others' mouths: "to push SMEs argumentations as part of EPEE approach – important these and SME members are brought to the fore in the lobbying". And this despite the nearly complete absence of small and medium sized enterprises (SMEs) in EPEE membership...

Industry's current lobbying to avoid a phase-out of HFCs

With the F-Gas Regulation now under review, the option of banning HFCs in some areas is clearly on the table, particularly given the failures of containment and recovery measures to stem the growth of HFC emissions. To face this new challenge, EPEE has hired the PR giant Grayling to run its secretariat for €150,000-200,000 a year to help make its case[52].

EPEE argues in favour of a gradual "phase-down", instead of a phase-out (see picture below). The phase-down approach, technically known as "economy-wide quantitative limits" (EWQL), is championed by industry as the best option because it allows new equipment to continue using HFCs long after alternatives could fully satisfy market demand, essentially keeping the market open to EPEE members.

A phase-down involves GWP-weighted quotas for HFCs sold each year in the EU. These quotas would decrease gradually over time, allowing the HFC industry to use progressively lower GWP HFCs and blends and maintain market share at the expense of alternative providers.

The HFC lobby argues that a phase-down will provide industry with flexibility and achieve the same environmental and economic benefits – if not more – than subsector-specific measures with placing on the market prohibitions (POMs). It is a line of argument which represents a false dichotomy. Bans and phase-down are not mutually exclusive and, indeed, are complementary to one another: bans in some sectors can contribute to the success of a phase-down.

At a stakeholder meeting organised by the Commission in Brussels last February Embraco, a business unit of Whirlpool which sells compressors to the world's leading manufacturers of cooling products, highlighted that it already delivers over 35% of compressors for commercial cabinets with alternative refrigerants (hydrocarbons) at acceptable costs. Embraco supports a phase-down approach in general for all F-gases but also supports bans on new compressors using HFCs[53].

Bans are the backbone of any serious policy to reduce HFC emissions and to ensure market conditions for alternative providers to achieve their full potential, environmental NGOs claim. They argue that ozone depleting substances phase outs have all been achieved with bans. Without bans, they say the HFC industry will be around for much longer than necessary to the detriment of the climate system. It would also create market uncertainty for the companies providing sustainable alternatives which require clear timeframes for planning and investment purposes[54].

With the whole HFC industry, EPEE is currently lobbying the Commission to avoid a phase-out of F-gases. Source: EPEE, August 2011[55].

The Six Commandments of the HFC lobbyist

Since the F-Gas Regulation review started in 2010, the HFC lobby has used different strategies to push its line of argument to the Commission. Here are six of them.

1. Lobby Commission officials

EPEE and some of its prominent members including Honeywell and the European Fluorocarbon Technical Committee (EFCTC) have obtained several meetings behind closed doors with key Commission officials, according to documents obtained through access-to-documents requests filed by CEO. The EFCTC lobbies for HFC manufacturers (Honeywell, DuPont, Arkema, Solvay, Mexichem), and is a branch of the powerful chemical industry lobby, the European Chemical Industry Council (CEFIC).

- On 23 June 2010, the global vice-president and general manager of **Honeywell** Chemicals flew from Honeywell headquarters in New Jersey, USA, to Brussels for an informal meeting with members of the cabinet of Climate Commissioner Connie Hedegaard.
- On 28 March 2011, lobbyists from the HFC manufacturer **Honeywell** met with key officials in DG Climate Action, which has the lead responsibility on the F-Gas Regulation review. It was at least the second informal meeting for Honeywell with DG Climate Action.
- On 4 July 2011, five **EPEE** representatives including lobbyists from **Daikin, Trane** and **Carrier** met with a key DG Enterprise official in her office to express their concerns on the independent report commissioned by the Commission.
- On 21 September 2011, the **EFCTC** invited two DG Climate Action officials for lunch in the CEFIC restaurant for informal discussions on the F-gas review.
- On 28 October 2011, an **EPEE** delegation including lobbyists from **Carrier, Daikin, Trane** and **DuPont** met a key DG Climate Action official for two hours.
- On 15 November 2011 a **Honeywell** lobbyist allegedly met with a member of cabinet of Climate Commissioner Hedegaard in the Berlaymont building.
- On 18 January 2012 the same DG Enterprise official that had met EPEE six months before had lunch in the CEFIC restaurant with lobbyists from the **EFCTC**.

Having had these meetings does not imply that the HFC lobby managed to successfully influence Commission officials, but it gives an impression of the amount of pressure developed. Public interest NGOs also had meetings with the Commission during the same period, but the HFC industry has a special weapon that NGOs don't have: it realises a turnover of more than € 30 billion and employs more than 200,000 people in Europe[56]. So it has the power to threaten to relocate some of these jobs outside the EU in case some of its demands are not satisfied...

2. Flood the Commission with copy-pasted "position papers"

When the Commission organised a public consultation on the review of the F-Gas Regulation in September 2011, it was flooded with responses from the HFC lobby. In its summary, the Commission noted that "industrial stakeholders clearly outnumber other organisations such as NGOs and administrations"[57]. It also pointed to the 'copy-paste' strategy of the HFC industry: "Some companies replied more than once since national branches, different departments or

daughter companies sent their responses separately, largely using the same text as the mother companies or headquarters."

3. Occupy the floor at stakeholders meetings

There was the same scenario at the stakeholders meeting organised in Brussels by the Commission in February 2012. The pro-HFC industry was present en masse with 84 lobbyists, while industry supporting natural refrigerants had 11 representatives and environmental NGOs only 7 representatives[58]. This imbalance was clearly reflected in the discussion given that "almost all stakeholders took the floor", according to the summary of the meeting. In 2010 the Commission had also set up an Expert Group on Fluorinated Gases to get "advice and expertise" during preparations for reviewing the F-Gas Regulation. In this group NGOs were completely outnumbered by HFC industry lobbyists[59].

4. Fund studies that support your position

Another key tactic used by the HFC industry lobby is to fund studies that purport to show that the current F-Gas Regulation is working well, that bans are not feasible, and that alternatives to HFCs are immature even though independent analyses, including those funded by the European Union and member states, reach the opposite conclusions. For instance, when EPEE met with DG Climate Action on 28 October 2011, it was to present an EPEE-sponsored study[60] saying that "containment legislation pays off"[61] – and thus implicitly than there is no need for any additional measures, including bans.

5. Sponsor a "workshop" to re-frame the debate

In order to re-frame the F-gas debate towards a "holistic approach", EPEE teamed up with the EurActiv network, a major source of online information on EU policy. In March 2012, EPEE sponsored a "workshop" hosted by EurActiv in Brussels entitled "F-gases: What role in climate change?"[62] A senior DG CLIMA official – the main target of HFC lobbyists – was invited to speak, and of course listen to EPEE's arguments[63]. In this case, EPEE's message was that "any additional measures" to be proposed in the review (i.e. bans) "should always take into account safety, energy efficiency and affordability for consumers, governments and industry"[64] – a tactical move to divert attention from the environmental impact of F-gases and at the same time cast doubt on alternatives to HFCs

6. Communicate that HFCs help save lives and the climate

The EFCTC recently launched its own lobbying campaign promoting HFCs as key gases for saving the climate, and preserving public health and security. Messages such as "HFCs refrigerants are preserving vaccines and blood banks", "90% of the world's asthma inhalers rely on HFC medical propellants", "Fluorocarbons are greenhouse gases that can reduce the greenhouse effect", or "For fire safety, fluorocarbons are essentials" appear successively every ten seconds on the front page of the EFCTC website[65]. In 2002, the EFCTC used the exact same arguments to oppose a total ban of F-gases[66], but what the EFCTC failed to mention then – as now – is that almost all the benefits that HFCs provide to humankind can be delivered by safe and cost-effective alternatives.

Montage of screenshots from EFCTC's website front page.

Climate Commissioner Connie Hedegaard, recently stated she is looking into a phase-down approach for F-gases, suggesting that the lobbying strategy of the HFC lobby is paying off. During a discussion with the European Parliament (EP)'s Committee on the Environment, Public Health and Food Safety (ENVI) on 26 April 2012, she declared: "[I]f we phase out things then there is this provision that there must be sustainable alternatives available, and therefore we can see that that will make slower progress than we have with a phasing down strategy."

She added: "So we are looking into phasing down strategy because the advantage with that is that there you can start relatively immediately, you do not have to wait for some suitable alternatives [...]. So all in all we think that the best environmental output is if you have a phasing down more than a phasing out, so that's why, that's what we're looking into."

But civil society representatives still hope that the Commission will also adopt subsector-specific bans for all possible subsectors based on independent studies, while also proposing other measures such as quantitative limits and improvements to containment and recovery, to

facilitate the transition and allow the earliest transitions possible. In their eyes, these different policy measures are not mutually exclusive.

Conclusion

The lobbying battle is still raging in Brussels. The HFC lobby is doing all it can to repeat the success it had in influencing the initial F-Gas Regulation while environmental NGOs are trying to show that banning HFCs is Europe's wider economic interest and an essential mitigation strategy. However with an estimated 10:1 ratio in lobbying budgets, even under the most optimistic scenario the HFC industry is likely to have a significant say in policy-making.

At the beginning of September the Commission started inter-services consultation on its draft proposal. Once the EU's executive arm has published its proposal – probably not before November – the next important battlefields will be in the Council and in the European Parliament.

The Commission's proposal is crucial, however, as it sets the direction of the policy, framing the debate in a way that can make it difficult to change its terms. This is the reason why civil society representatives are looking to the Commission to lead on this critical climate issue. Should that leadership be found lacking, it will be the European Parliament and the Council that will have to pick up the pieces if the EU is truly to transition to a low-carbon economy.

But the EU has also a global responsibility for delivering an ambitious regulation on HFCs and other F-gases. It is well-known that large parts of EU regulations are often copy-pasted in developing countries' laws, often to get access to the EU market. This is particularly important given that most HFC emissions will come from the developing world in the years and decades to come. An ambitious EU regulation could also facilitate and drive international talks under the Montreal Protocol to regulate HFCs at the global level – a process currently blocked by Brazil, China and India[67].

Appendix 1: Timeline of the genesis and review of the EU F-Gas Regulation

Genesis of the F-Gas Regulation (2000-2006)	
2000	Industry-dominated working group on F-gases set up by the Commission.
Spring 2001	End of working group discussions.
12 August 2003	European Commission adopts proposal for regulation to reduce F-gas emissions by 2010.
16 March 2004	1st reading in the Environment Committee of the European Parliament.
31 March 2004	1st reading at the European Parliament in Strasbourg.
October 2004	The Environment Council of Ministers splits the Commission proposal in two: a regulation on 'stationary' industrial installations and a directive to phase out HFC-134a from car air conditioning systems.
21 June 2005	Council adopts common position.
11 October 2005	2nd reading in the Environment Committee of the Parliament.
26 October 2005	2nd reading at the European Parliament in Strasbourg.
23 December 2005	Commission rejects some amendments voted by the European Parliament.
31 January 2006	Parliament, Council and Commission reach compromise agreement (trialogue).
6 April 2006	3rd reading at the European Parliament in Strasbourg.
25 April 2006	Council adopts rules on F-gases and air conditioning in motor vehicles.
Review of the F-Gas Regulation (2010-2013)	
December 2009	Öko-Recherche and partners get service contract to assist the Commission in reviewing the F-Gas Regulation by providing technical data, analyses and general support.
2010	The Commission sets up an industry-dominated Expert Group on Fluorinated Gases to get "advice and expertise" during preparations for reviewing the F-Gas Regulation.
May 2011	End of Expert Group on Fluorinated Gases discussions on the draft report by Öko-Recherche.
June 2011	Umweltbundesamt (UBA), the German Federal Environment Agency, publishes report saying that HFC technologies can be banned and replaced with non-HFC technologies.
14 September 2011	European Parliament adopts resolution urging the Commission "to come forward with a revision of F-gas regulations and make proposals for a rapid phase-down of the production and consumption of HFCs".
26 September 2011	Commission publishes Öko-Recherche's study for a review of the F-Gas Regulation and its own report on the "application, effects and adequacy" of the F-Gas Regulation. Public consultation launched on F-gas review until 19 December.
October 2011	EPEE launches report commissioned to ERIE/ARMINES, "1990 to 2010 Refrigerant inventories for Europe - Previsions on banks and emissions from 2006 to 2030 for the European Union".
13 February 2012	Stakeholders meeting on the review of the F-Gas Regulation in Brussels.
March 2012	Commission publishes report commissioned to SKM Enviros contractor on "Further Assessment of Policy Options for the Management and Destruction of Banks of ODS and F-Gases in the EU".
30 May 2012	Environmental Investigation Agency launches report commissioned to Karlsruhe University of Applied Sciences, "Availability of Low-GWP Alternatives to HFCs: Feasibility of an Early Phase-Out of HFCs by 2020".
End 2012	Commission to publish its proposal for a review of the F-Gas Regulation.

Appendix 2: Mapping the European F-gas lobby in 2012

The organisations listed in the table below represent interest groups which are active on the review of the F-Gas Regulation. Some 111 organisations representing F-gas industry-related interests, eight organisations representing sectors of industry using alternatives to F-gases, and eight organisations representing environmental interests have been identified by combining: (i) the stakeholders represented in the Expert Group on Fluorinated Gases set up by the European Commission; (ii) the participants to the stakeholders meeting on the review of the F-Gas Regulation held on 13 February 2012 in Brussels; (iii) key members of the European Partnership for Energy and the Environment (EPEE), the main industry lobby group on F-gas issues; and (iv) other organisations or companies registered to the EU Transparency Register emerging in searches conducted with specific keywords ('HFC', 'F-gas', 'refrigerant'...).

The data from the EU Transparency Register compiled here provides an imperfect picture of the reality of lobbying expenditure by the organisations mentioned because accounting methods vary widely among registered entities, the time periods taken into account are not similar, and the general reliability of the register's data remains very poor[68]. Also, the registered amounts do not necessarily represent the real expenditure on F-gas lobbying because the vast majority of stakeholders are also lobbying on other EU policies. It however shows very clearly the difference in resources available for the ongoing and upcoming lobbying battles.

A spreadsheet with more detailed data is also available online: http://bit.ly/EU_F-Gas_lobby.

#	Name	Office(s)	Registered	Lobbying budget	Lobbyists (declared)	Lobbyists (adjusted)	Networking	In expert group on F-gases	At stake-holders meeting	Mentions in register	Consultancy hired
	INDUSTRY PLATFORMS										
01	AREA – Air Conditioning and Refrigeration European Association	Brussels	09/12/2011	< 50,000 € (2011)	0.3	0.3	EPEE, EHPA	Y	Y	6	
02	ASSURE – European Association for the Responsible Use of HFCs in Fire Protection	UK	03/10/2011	50,000 € - 100,000 €	4	4	-	Y	Y	1	
03	ECSLA – European Cold Storage and Logistics Association	Brussels	12/10/2011	300,000 € - 350,000 € (2010)	4	4	-	Y	Y	4	
04	EECA – European Electronic Component Manufacturers / ESIA – European Semiconductor Industry Association	Brussels	28/02/2012	100,000 € - 150,000 € (2010)	2	2	WSC, AENEAS	Y	Y	3	
05	EFCTC – European Fluorocarbon Technical Committee	Brussels	08/12/2011	200,000 € - 250,000 € (2011)	15	15	EPEE	Y	Y	1	
06	EPEE – European Partnership for Energy and the Environment	Brussels	25/03/2011	500,000 € - 550,000 € (2010, total budget)	2	2	EHPA	Y	Y	20	Grayling (2011) : 150,000 € -200,000 €
07	EUROFEU – European Committee of the Manufacturers of Fire Protection Equipment and Fire Fighting Vehicles	Germany	30/01/2012	14,160 € (2011)	3	3	-	Y	Y	1	
08	EUROVENT – European Committee of Air Handling and Refrigeration Equipment Industries	Brussels	21/01/2012	100,000 € - 150,000 € (2011)	1.5	1.5	-	Y	Y	7	
09	FEA – European Aerosol Federation	Brussels	15/03/2009	< 50,000 € (2011)	1	1	DUCC	Y	Y	1	
10	JRAIA – Japan Refrigeration and Air Conditioning Industry Association	Japan / Brussels (JROAME[69])	29/11/2011	650,995 € (2010)	2.5	2.5	EPEE, JBCE, ICARHMA	Y	Y	2	Grayling (2011) : <50,000 €
11	T&D Europe – European Association of the Electricity Transmission and Distribution Equipment and Services Industry	Brussels	23/09/2010	< 50,000 € (2010)	1.5	1.5	Orgalime	Y	Y	6	
12	Transfrigoroute International	Brussels	16/09/2009	< 50,000 €	3	3	IRU, IIF/IIR, UNECE, UNIDO, ECSLA	Y	Y	3	Grayling (2011) 50,000 € - 100,000 €
13	EXIBA – European Extruded Polystyrene insulation board Association (CEFIC branch)	Brussels	Not registered	-	-	1	-	Y	Y	1	FTI Consulting Belgium (2010) 50,000 € - 100,000 €

#	Name	Office(s)	Registered	Lobbying budget	Lobbyists (declared)	Lobbyists (adjusted)	Networking	In expert group on F-gases	At stake-holders meeting	Mentions in register	Consultancy hired
14	IPAC – International Pharmaceutical Aerosol Consortium	USA	Not registered	-	-	1	-	Y	Y	0	
15	MAC Partners Europe – European Association for Mobile Air Conditionning Services	Netherlands	Not registered	-	-	1	-	Y	Y	0	
16	CECED – European Committee of Domestic Equipment Manufacturers	Brussels	21/05/2010	500,000 € - 600,000 € (2011)	2	2	Coalition for Energy Savings, Energy Efficiency Industrial Forum	Y	N	14	FTI Consulting Belgium (2010) 50,000 € - 100,000 €
17	Eurelectric – Union of the Electricity Industry	Brussels	01/12/2008	300,000 € - 350,000 € (2011)	8	8	FAIB, EEF, MEDELEC, AECI	Y	N	40	
18	EVA – European Vending Association	Brussels	07/03/2012	< 50,000 € (2011)	2	2	-	Y	N	3	
19	IIR – International Institute of Refrigeration	France	16/12/2011	1,191,500 € (2011, total budget)	2	2	-	Y	N	5	
20	ISOPA – European Diisocyanate and Polyol Producers Association	Brussels	10/03/2010	150,000 € - 200,000 € (2012)	2	2	CEFIC	Y	N	4	Fleishman-Hillard (2011) 350,000 € - 400,000 €
21	IMA – International Magnesium Association	USA	Not registered	-	-	-	-	Y	N	0	
22	PU Europe – the European voice of the polyurethane insulation industry	Brussels	Not registered	-	-	-	-	Y	N	2	
23	ACEA – European Automobile Manufacturers Association	Brussels	18/12/2008	2,000,000 € - 2,250,000 € (2011)	12	12	ERTICO, ERTRAC, FAS, Alliance for a Competitive European Industry Kangaroo Group	N	Y	40	-
24	ACRIB – Air Conditioning and Refrigeration Industry Board	UK	08/12/2011	5,000 € (2010)	<1	0.5	EPEE	N	Y	2	
25	ADHAC – Asociación de Empresas de Redes de Calor y Frío	Spain	26/01/2012	6,000 € (2011)	2	2	Euroheat & Power	N	Y	1	
26	AFBEL – Asociación Fabricantes de Bienes de Equipo Eléctricos	Spain	21/10/2011	30,000 € (2010)	2	2	Orgalime, CEOE, Sercobe, Confemetal, T/D Europe	N	Y	2	
27	AGORIA – Belgian Federation for the Technology Industry	Brussels	20/10/2010	200,000 € - 250,000 € (2010)	2	2	-	N	Y	6	
28	AHAM – Association of Home Appliance Manufacturers	USA	30/11/2011	< 50,000 € (2011)	1	1	-	N	Y	1	
29	AmCham EU – American Chamber of Commerce to the European Union	Brussels	14/10/2008	400,000 € - 450,000 € (2010)	9	9	EPC, CEPS, US Chamber of Commerce	N	Y	64	
30	ANIE – Federazione	Italy	21/05/2010	< 50,000 € (2011)	10	10	CONFINDUSTRIA	N	Y	2	

#	Name	Office(s)	Registered	Lobbying budget	Lobbyists (declared)	Lobbyists (adjusted)	Networking	In expert group on F-gases	At stake-holders meeting	Mentions in register	Consultancy hired
	Nazionale Imprese Elettrotecniche ed Elettroniche										
31	BDEW – Bundesverband der Energie- und Wasserwirtschaft - German Association of Energy and Water Industries	Germany / Brussels	16/03/2009	2,250,000 € - 2,500,000 € (2011)	20	20	ENGVA, EUREAU, EURELECTRIC, EUROGAS	N	Y	8	
32	BEAMA – British Electrotechnical and Allied Manufacturers Association	UK	26/01/2012	< 50,000 € (2010)	10	10	ORGALIME	N	Y	2	
33	CEOE – Confederación Española de Organizaciones Empresariales	Spain / Brussels	29/05/2012	632 341 € (2011)	7	7	BUSINESSEUROPE	N	Y	23	
34	CER – Community of European Railway and Infrastructure Companies	Brussels	02/07/2008	1,000,000 € - 1,250,000 € (2011)	12	12	European Rail Circle, Rail Forum Europe, E5, EACD, New Opera, Friends of Europe, CEPS	N	Y	2	
35	EHI – Association of the European Heating Industry	Brussels	10/04/2012	200,000 € - 250,000 € (2011)	1.5	1.5	-	N	Y	1	
36	EIGA – European Industrial Gases Association	Brussels	30/06/2011	50,000 € - 100,000 € (2011)	3	3	CEFIC	N	Y	3	
37	EPIA – European Photovoltaic Industry Association	Brussels	22/09/2008	250,000 € - 300,000 € (2010)	22	1	EREC, PV Cycle, IEA-PVPS, Eufores	N	Y	13	ESL & Network European Affairs SA (2010) <50,000 €
38	FoodDrinkEurope	Brussels	12/11/2010	200,000 € - 250,000 € (2010)	2	2	-	N	Y	24	
39	IZW e.V. Information Centre of Heat Pumps and Refrigeration	Germany	15/12/2011	30,000 € (2011)	2	2	-	N	Y	1	
40	JBCE – Japan Business Council in Europe	Brussels	11/02/2009	<50,000 € (2010)	250	1	-	N	Y	7	Grayling (2011) <50,000 €
41	SKLL - FREA – Suomen Kylmäliikkeiden Liitto ry - Finnish Refrigeration Enterprises Association	Finland	19/12/2011	< 50,000 € (2011)	1	1	AREA	N	Y	1	
42	VDA – German Association of the Automotive Industry	Germany / Brussels	14/12/2010	450,000 € (2011)	5	5	ACEA, CLEPA	N	Y	8	
43	ZVEI – German Electrical and Electronic Manufacturers' Association	Germany / Brussels	24/08/2011	250,000 € - 300,000 € (2010)	4	4	ORGALIME, T&D Europe, CECED,...	N	Y	14	
44	ANIMA – Federazione delle Associazioni Nazionali dell'Industria Meccanica Varia ed Affine	Italy	Not registered	-	-	1	-	N	Y	0	
45	BDH – Federal Industrial Association of Germany	Germany	Not registered	-	-	1	-	N	Y	0	

#	Name	Office(s)	Registered	Lobbying budget	Lobbyists (declared)	Lobbyists (adjusted)	Networking	In expert group on F-gases	At stake-holders meeting	Mentions in register	Consultancy hired
	House, Energy and Environmental Technology										
46	Lithuanian National Association of Refrigeration	Lithuania	Not registered	-	-	1	-	N	Y	0	
47	AFCE – Alliance Froid Climatisation Environnement	France	26/10/2011	10,000 € (2010)	0.5	0.5	EPEE	N	N	1	
48	AFEC – Asociación de Fabricantes de Equipos de Climatización	Spain	15/12/2011	< 50,000 € (2010)	4	4	EUROVENT, EHPA	N	N	1	
49	AFF – Association Française du Froid	France	21/11/2011	< 50,000 € (2010)	600	1	IFF	N	N	2	
50	AMDEA – Association of Manufacturers of Domestic Appliances	UK	05/03/2012	400,000 € - 450,000 € (2011)	6	6	CECED[70], CBI	N	N	2	
51	ATF – Associazione dei Tecnici del Freddo	Italy	12/12/2011	1,000 € (2011)	2.5	2.5	AREA	N	N	1	
52	DKV – Deutscher Kaelte- und Klimatechnischer Verein e.V.	Germany	19/12/2011	105,000 € (2011)	1300	1	ASHRAE, ÖKKV[71], SVK[72]	N	N	1	
53	SKY – Suomen Kylmäyhdistys ry - Finnish Society of Refrigeration	Finland	19/12/2011	< 50,000 € (2011)	0.5	0.5	-	N	N	1	
54	SNEFCCA – Syndicat National des Entreprises du Froid, d'Équipements de Cuisines Professionnelles et du Conditionnement de l'Air	France	19/12/2011	20,000 € (2011)	2	2	AREA	N	N	1	
55	UNICLIMA – French association of heating,ventilation air conditioning and refrigeration industries	France	12/12/2011	50,000 € - 100,000 € (2010)	1	1	ORGALIME, EPEE, EUROVENT	N	N	3	
56	AiCARR – Associazione Italiana Condizionamento dell'Aria, Riscaldamento e Refrigerazione	Italy	Not registered	-	-	1	-	N	N	0	
57	ASERCOM – Association of European Refrigeration Component Manufacturers	Germany / Brussels	Not registered	-	-	1	-	N	N	1	
58	EHPA – European Heat Pump Association	Brussels	18/02/2009	350,000 € - 400,000 € (2011)	4	4	-		N	12	

#	Name	Office(s)	Registered	Lobbying budget	Lobbyists (declared)	Lobbyists (adjusted)	Networking	In expert group on F-gases	At stake-holders meeting	Mentions in register	Consultancy hired
	COMPANIES										
59	Arkema	France	02/11/2011	< 50,000 € (2010) [Grants : 1,470,000 € (FP7)]	1	1	CEFIC and affiliates (Eurochlor, ECVM…)	N	Y	2	EPPA (2011) 50,000 € - 100,000 €
60	BP	Brussels	14/11/2008	600,000 € - 700,000 € (2011)	5	5	EUROPIA, CONCAWE, OGP, EUROGAS, TPN, EEF, EABC,...	N	Y	–	–
61	CEMAFROID	France	14/12/2011	4,100,000 € (2011, turnover)	42	1	IFF, UNECE, AFF, SFSTP	N	Y	1	
62	Climalife - Dehon	Brussels	18/12/2011	< 50,000 € (2010)	2	2	EPEE	N	Y	1	
63	Daikin Europe NV (see 16 other EU subsidiaries below)	Belgium	07/10/2011	100,000 € - 150,000 € (2010)	8	8	EPEE, CECED, JBCE, EHI, EHPA	N	Y	18	Acumen Public Affairs (2010) < 50,000 €
64	Daimler AG	Germany / Brussels	18/12/2008	2,851,500 € (2011)	10.5	10.5	ACEA, VDA, Amcham EU, BDI, BDA, FAS, EPC, TPN	N	Y	3	ESL & Network European Affairs SA (2010) <50,000 €
65	Deutsche Bahn AG	Germany / Brussels	08/10/2008	613 000 € (2010)	4	4	CER, UITP, UIRR, UIC, Rail Forum Europe	N	Y	1	
66	Du Pont de Nemours International SARL	Switzerland / Brussels	07/01/2009	150,000 € - 200,000 € (2011)	5	5	CEFIC, EuropaBio, Plastics Europe, ECPA, EPA, ESA, Business Europe, AmCham to the EU, EPC	N	Y	1	
67	EADS - European Aeronautic Defence and Space Company	Netherlands / Brussels	26/11/2008	500,000 € - 600,000 € (2011)	11	11	ASD, EOS, SDA, Kangaroo Group, British Chamber of Commerce in Belgium, EFM	N	Y	5+	Arcturus Group (2010) <50,000 € Avisa Partners (2011) 100,000 – 150,000 € Business Bridge Europe (2011) <50,000 € Top Strategies (06/2009-06/2010) <50,000 €
68	Eaton Electric Limited	UK	13/12/2011	50,000 € - 100,000 € (2011)	5	5	Green Switching Platform, BEAMA	N	Y	1	Burson Marsteller (2010) 50,000 € - 100,000 €
69	Electrolux Home Products Corporation	Brussels	01/07/2008	400,000 € - 450,000 € (2011)	4	4	CECED, SEAP	N	Y		
70	Frigo 2000 srl	Italy	16/12/2011	< 50,000 € (2011)	1	1	-	N	Y	1	
71	Fujitsu General Euro GmbH	Germany	13/12/2011	50,000 € - 100,000 € (2010)	4	4	EPEE, JBCE, EHPA, BWP (Germany), FGK (Germany)	N	Y	2	
72	Henkel AG & Co. KGaA	Germany / Brussels	22/12/2009	450,000 € - 500,000 € (2011)	4	4	AIM, AISE, Colipa, FEICA	N	Y	2	FIPRA International Limited (2010) 250,000 – 300,000 €
73	Ingersoll Rand International	Ireland /	29/05/2012	50,000 € - 100,000 €	2.5	2.5	EPEE,	N	Y	2	ADS Insight (2011)

#	Name	Office(s)	Registered	Lobbying budget	Lobbyists (declared)	Lobbyists (adjusted)	Networking	In expert group on F-gases	At stake-holders meeting	Mentions in register	Consultancy hired
	Ltd.	Brussels		(Jan.-May 2012)			Transfrigoroute International, IBEC, AmCham EU, EABC				<50,000 €
74	Johnson Controls	USA / Brussels	05/01/2010	150,000 € - 200,000 € (2011)	4	4	EPEE, EUROBAT, EuroACE, CLEPA, EUBAC, ECSLA, Eurammon, TechAmerica Europe, AmCham to the EU	N	Y	3	APCO Worldwide (2010) < 50,000 € Weber Shandwick (2010) < 50,000 €
75	LG Electronics	France	11/07/2011	50,000 € - 100,000 € (2010)	2	2	-	N	Y	1	
76	MAN SE	Germany / Brussels	24/02/2009	80,000 € (2011)	6	6	ACEA, FAS, BDI, VDA, VDMA	N	Y	1	
77	Mexichem UK Limited	UK	24/10/2011	< 50,000 € (2010)	1	1	EPEE, CEFIC, CIA (UK)	N	Y	1	
78	Mitsubishi Electric Air Conditioning Systems Europe Ltd	UK	20/12/2011	50,000 € - 100,000 € (2010)	450	2	FETA, EPEE, Eurovent, DEFRA, EHI, ACRIB, EHPA, HPA	N	Y	3	Edelman (07/2010 - 06/2011) < 50,000 €
79	PSA Peugeot Citroën	France / Brussels	13/12/2011	350,000 € - 400,000 € (2011)	4	4	ACEA	N	Y	2	
80	Red Eléctrica de España	Brussels / Spain	16/02/2011	300,000 € (2011)	1	1	ENTSO-E, DESERTEC, MEDGRID, Friends of the Supergrid	N	Y	1	
81	Sub-Zero, Inc	USA	22/11/2011	5,000 € (2011)	3	3	-	N	Y	2	
82	The Westye Group Europe Ltd.	UK / Brussels / France / Spain	13/12/2011	13,800 € (2011, total budget from Sub-Zero Inc.)	3	3	AMDEA, REPIC	N	Y	1	
83	Tyco International	Switzerland	27/10/2011	50,000 € - 100,000 € (2011)	1	1	AmCham EU, BusinessEurope, TPN, EUnited, Euralarm	N	Y	1	
84	Whirlpool Europe	Italy	24/08/2011	284,000€ (2010)	3	3	CECED	N	Y	2	Cattaneo Zanetto & Co. (2012) < 50,000 €
85	Daikin AC Spain, S.A.	Spain	02/11/2011	0 €	256	1	AFEC	N	N	1	
86	Daikin Air Conditioning France	France	10/11/2011	< 50,000 € (2010)	4	4	UNICLIMA	N	N	1	
87	Daikin Air Conditioning Greece SA	Greece	02/12/2011	< 50,000 € (2010)	3	3	SVEIS	N	N	1	
88	Daikin Air Conditioning Italy SpA	Italy	03/11/2011	< 50,000 € (2010)	1	1	CECED Italia, ANIMA-COAER, ANDEC, AIRCARR	N	N	1	
89	Daikin Airconditioning Central Europe - Romania SRL	Romania	04/11/2011	5,000 € (2010)	3	3	EPEE, EHPA, AGFR	N	N	1	
90	Daikin Airconditioning	Slovakia	03/11/2011	5,000 € (2010)	3	3	EPEE, EHPA,	N	N	1	

#	Name	Office(s)	Registered	Lobbying budget	Lobbyists (declared)	Lobbyists (adjusted)	Networking	In expert group on F-gases	At stake-holders meeting	Mentions in register	Consultancy hired
	Central Europe - Slovakia s.r.o.						SZCHKT				
91	Daikin Airconditioning Central Europe HandelsgmbH	Austria	25/10/2011	10,000 € (2010)	3	3	EPEE, EHPA, ÖKKV	N	N	1	
92	Daikin Airconditioning Germany	Germany	17/11/2011	< 50,000 € (2010)	2	2	ZVKKW,BIV, EPEE	N	N	1	
93	Daikin Airconditioning Netherlands BV	Netherlands	03/11/2011	< 50,000 € (2010)	3	3	VERAC, NVKL, DHPA	N	N	1	
94	Daikin Airconditioning Poland sp. z o.o.	Poland	15/11/2011	< 50,000 € (2010)	3	3	KFCh[73], PORT PC[74], EHI, EHPA	N	N	1	
95	Daikin Belgium	Belgium	03/11/2011	< 50,000 € (2010)	3	3	Warmtepomp platform Vlaanderen, RBF[75], ACA, ATTB	N	N	1	
96	Daikin Industries Czech Republic s.r.o.	Czech Republic	18/11/2011	< 50,000 € (2010)	0.5	0.5	-	N	N	1	
97	Daikin McQuay Magyarország Kft.	Hungary	09/11/2011	5,000 € (2010)	4	4	-	N	N	1	
98	Daikin Portugal Sa	Portugal	07/11/2011	< 50,000 € (2010)	6	6	APIRAC, AGEFE, ATEHP, APISOLAR	N	N	1	
99	Daikin Sweden AB	Sweden	03/11/2011	< 50,000 € (2010)	1	1	SVEP[76], SKIF[77]	N	N	1	
100	Daikin UK	UK	18/11/2011	50,000 € - 100,000 € (2010)	250	1	FETA, Micropower Council, BEEMA, HHIC	N	N	1	
101	Danfoss A/S	Denmark / Brussels	02/07/2009	700,000 € - 750,000 € (2010)	10	10	EuroHeat & Power, EHPA, EuroAce, EPEE, ARAP, ASHRI	N	N		
102	Eaton Industries (Netherlands) B.V.	Netherlands	16/11/2011	50,000 € - 100,000 € (2011)	5	5	Green Switching Platform	N	N	1	
103	Emerson	-	Not registered	-	-	1	EPEE, ARAP	N	N	1	Kreab Gavin Anderson (2010) 250,000 € - 300,000 €
104	Enertherm	France	10/11/2011	150,000 € - 200,000 € (2011)	72	1	FEDENE, AMORCE, CLIMAFORT, AFCE	N	N	1	
105	Hitachi Corporate Office, Europe	Japan / Brussels	24/04/2009	< 50,000 € (2010)	5	5	Japanese Business Council in Europe, EPoSS ETP, CSR Europe	N	N	3	Brussels Direct (2011) < 50,000 € (Hitachi Ltd., not on F-Gases issue)
106	Honeywell Europe NV	Belgium	18/02/2010	250,000 € - 300,000 € (2011) [Grants : 3,900,000 €]	3	3	AMCHAM EU, TechAmerica Europe, UK ACE	N	N	2	ADS Insight (2011) 50,000 € - 100,000 €.
107	National Refrigerants Ltd	UK	29/11/2011	< 50,000 € (2011)	1	1	-	N	N	1	
108	Norpe Oy	Finland	27/04/2010	< 50,000 € (2011)	2	2	FFTI[78]	N	N	1	
109	Solvay SA	Brussels	19/02/2009	250,000 € - 300,000 € (2011)	10	10	EPEE, CEFIC, BusinessEurope, ERT	N	N	3	
110	Technetium Consulting Oy	Finland	26/04/2010	< 50,000 € (2011)	3	3	-	N	N	1	
111	Tecumseh Europe	France	15/12/2011	< 50,000 € (2011)	1350	1	ASERCOM, EPEE, UNICLIMA	N	N	1	

#	Name	Office(s)	Registered	Lobbying budget	Lobbyists (declared)	Lobbyists (adjusted)	Networking	In expert group on F-gases	At stake-holders meeting	Mentions in register	Consultancy hired
	INDUSTRY SIGNIFICANTLY SUPPORTING NATURAL REFRIGERANTS										
112	Eurammon – Initiative for natural refrigerants	Germany	Not registered	-	-	1	-	Y	Y	0	
113	Refrigerants Naturally	Germany	Not registered	-	-	1	-	Y	Y	0	
114	Shecco	Brussels	16/11/2011	300,000 € - 350,000 € (2011)	5	5	EHPA, Going Electric	Y	Y	1	
115	3M Belgium	USA / Brussels	15/12/2011	300,000 € - 350,000 € (2010)	1	1	AmCham EU, TechAmerica Europe	N	Y	1	
116	Carrier Transicold EMEA (United Technologies Corp.)	USA / Brussels	06/09/2010	250,000 € - 300,000 € (2010)	4	4	EPEE, AmCham EU, EuroACE, Friends of Europe, EPC, TechAmerica Europe...	N	Y	1	
117	EMBRACO	-	Not registered	-	-	1	-	N	Y	0	
118	Mayekawa (industrial refrigeration compressors)	-	Not registered	-	-	1	-	N	Y	1	Shecco (2010 & 2011) 50,000 € - 100,000 €.
119	R744.com – Industry platform for CO_2 cooling and heating experts worldwide	-	Not registered	-	-	1	-	N	Y	0	(run by Shecco)

#	Name	Office(s)	Registered	Lobbying budget	Lobbyists (declared)	Lobbyists (adjusted)	Networking	In expert group on F-gases	At stake-holders meeting	Mentions in register	Consultancy hired
	PUBLIC INTEREST NGOs										
120	EIA - Environmental Investigation Agency	UK	07/02/2012	< 50,000 € (2011)	7	5	SSN[79], CAN-Europe, ECA[80], FLA[81]	Y	Y	1	
121	Greenpeace	Brussels	29/10/2008	750,000 € (2010)	10	1	Green10, ALTER-EU, CAN Europe	Y	N	7	Stefan Scheuer (2011) <50,000 €
122	WWF European Policy Programme	Brussels / Switzerland	23/09/2008	450,000 € - 500,000 € (2010-2011)	35	1	Green 10, Act for Europe, CAN, IUCN, ECOS, EHF, Friends of Europe	Y	N	14	Elizabeth Drury (2010) 50,000 – 100,000 €
123	CDM Watch	Brussels	11/04/2012	200,000 € (2011, total budget)	3	2	German NGO Forum Environment and Development, CAN-Europe	N	Y	1	
124	Climate Action Network Europe	Brussels	11/02/2009	50,000 € - 100,000 € (2010)	5.3	1	Green 10	N	Y	5	Elizabeth Drury (2010) < 50,000 €
125	Natuur & Milieu	Netherlands	07/03/2011	50,000 € - 100,000 € (2011)	20	1	T&E[82], EEB, CAN-Europe	N	Y	1	
126	DUH – Deutsche Umwelthilfe e.V	Berlin	13/01/2012	< 50,000 € (2011)	73	1.5	EEB, T&E	N	N	1	
127	EEB – European Environmental Bureau	Brussels	06/03/2009	600,000 € - 700,000 € (2011)	13	1	Green 10, ECOS, Seas at Risk, MIO[83], EPE[84], EHF[85]	N	N	34	Stefan Scheuer (2011) <50,000 €

Appendix 3: Substitution options in new equipment and systems

Sector	Subsector	Substitution options in new equipment
Closed systems		
Domestic refrigeration	Refrigerators / freezers / Tumble dryers	Isobutane
Commercial refrigeration	Plug-in appliances	Isobutane, Propene, Propane, CO_2, NH_3
	Condensing unit systems	
	Centralised systems	
Industrial refrigeration	Food processing	Propane, Isobutane, NH_3, NH_3/CO_2
	Chemical / pharmaceutical	
	Coldstores	
	Sports and leisure facilities	
	Metal industry	
	Industrial heat pumps	CO_2
Stationary air conditioning	Room air conditioners	H_2O, NH_3, Hydrocarbons, NH_3/DME
	Building air conditioners / Chillers	
	Domestic heat pumps	Propane, CO_2
Fire protection	Fire extinguishing agents	CO_2, N_2, Argon
Open systems		
Aerosols	Technical sprays	Propane, Isobutane, CO_2, N_2
	Freezer sprays	
	Compressed air sprays	
	Other technical sprays	
	Medicinal sprays	Powder inhalers
Foams	Rigid foams for thermal insulation (XPS, PUR)	CO_2, CO_2/Ethanol, Pentane
	Flexible PUR foams	CO_2
	Integral PUR foams	CO_2, Pentane
	Caulking foams	290, Butane, DME

Source: German federal environment agency (UBA), June 2011[86].

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