environmental investigation agency

Chilling Facts III

Supermarkets are reducing the climate change impact of refrigeration

About EIA

The Environmental Investigation Agency is a small organisation set up more than 25 years ago to fight environmental crime. We have developed innovative and effective investigative methods for defending the environment and seeking lasting solutions. From stopping the live transport of wild birds and getting the elephant ivory trade ban in place in the late 1990s to shutting down one of the biggest illegal timber trade routes, EIA's work has changed the face of the world for the better.

We play a unique and essential role in combating climate change. In addition to campaigning to reduce emissions of HFCs and other greenhouse gases, our work on the ground to stop illegal logging and protect the habitats of endangered species helps prevent the deforestation that is fuelling climate change.

A call for action

EIA IS CALLING ON ALL SUPERMARKETS TO:

1. Commit to fully phasing out HFCs by 2015
2. Use HFC-free refrigeration in all new builds and refits
3. Phase out HFCs in all air-conditioning systems, transport and distribution centres

EIA IS CALLING ON THE UK GOVERNMENT TO:

1. Support an ambitious HFC phase-out as part of Europe's F-gas regulation review
2. Introduce a tax on HFCs
3. Provide incentives for training refrigeration engineers to work with HFC-free technologies

Background

EIA's Chilling Facts campaign began in 2008. Since then – it is now in its third year – we have seen significant progress by UK supermarkets in reducing the climate change impact of their refrigeration and cooling systems.

The first survey results, published early in 2009, were hugely disappointing. They showed that as much as one-third of a supermarket's carbon footprint was coming from the cooling gases in its refrigeration systems. And, at that point, there were just 14 stores across the whole of the UK using only climate-friendly technologies.

The Chilling Facts campaign has focused on getting supermarkets to move away from using HFCs (hydrofluorocarbons) because they have a climate change impact that is many thousands of times worse than carbon dioxide (CO_2).

Following the publication of our first report, several supermarket chains started to tackle this issue. Last year's report revealed some progress, with 46 supermarket stores running on climate-friendly refrigeration. A number of retailers were also making firm pledges to move away from HFCs within a set time frame.

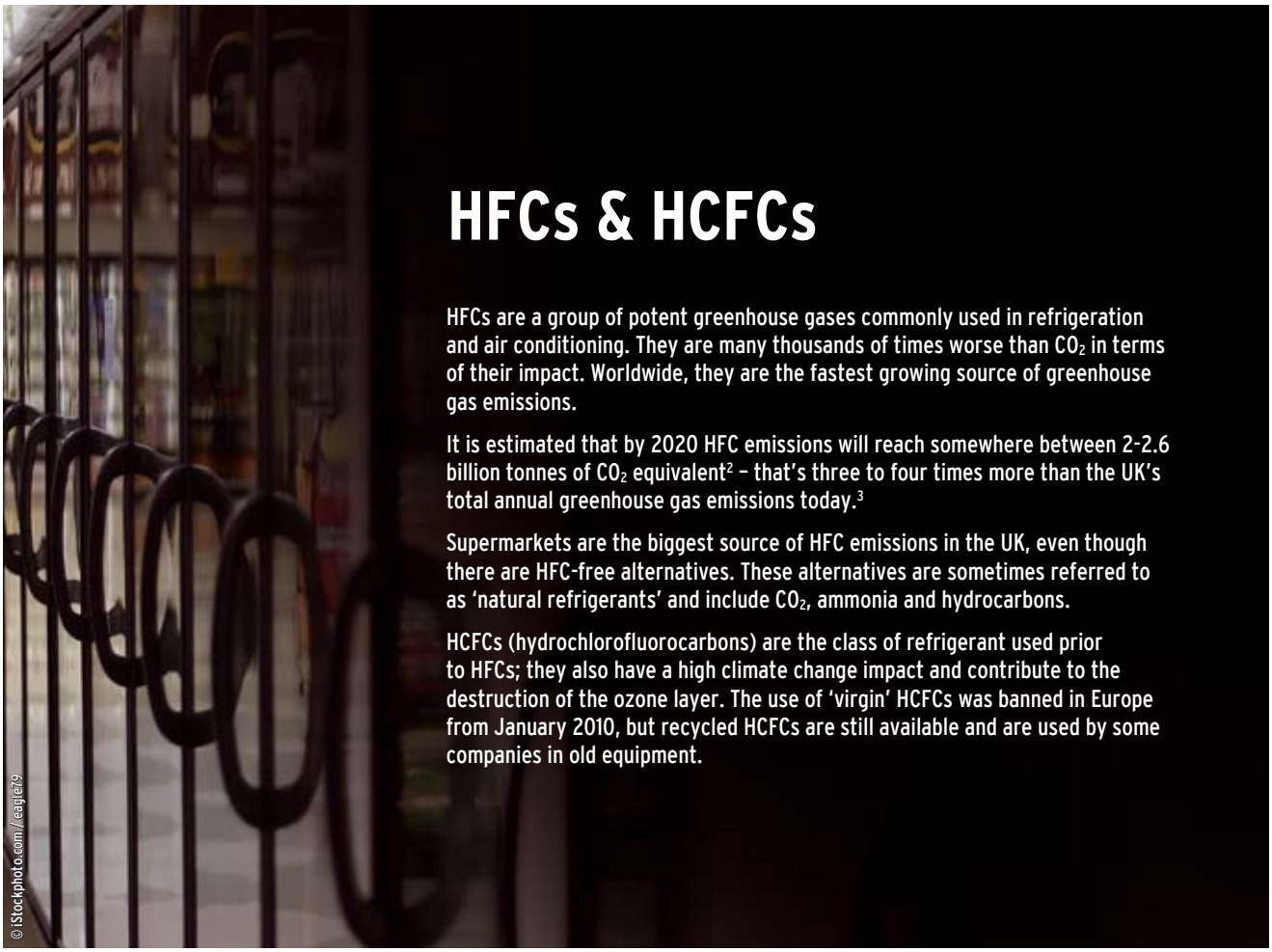
This year the judges have been very encouraged by the improved commitment of supermarkets in phasing out HFCs. With 239 stores now using climate-friendly refrigeration and many more in the pipeline, they have proved that this is both technically feasible and commercially viable.[1] In fact, some have even found ways of saving money and improving on energy efficiency too.

For the first two years, Chilling Facts focused on supermarket refrigeration. This year, we've included air conditioning as an issue. Many of these systems also use HFCs, when there are viable alternatives.

1. This figure includes 70 Morrisons stores in which one-third of the systems are running on climate-friendly refrigeration.

2. Velders G., D. Fahey, J. Daniel, M. McFarland and S. Anderson (2009) "The large contribution of projected HFC emissions to future climate forcing" PROC. NAT'L. ACAD. SCI. Early Edition (22 June 2009).

3. According to United Nations Framework Convention on Climate Change (UNFCCC) data reporting the UK's total greenhouse gas emissions in 2008 were 632 million tonnes CO_2e.



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HFCs & HCFCs

HFCs are a group of potent greenhouse gases commonly used in refrigeration and air conditioning. They are many thousands of times worse than CO_2 in terms of their impact. Worldwide, they are the fastest growing source of greenhouse gas emissions.

It is estimated that by 2020 HFC emissions will reach somewhere between 2-2.6 billion tonnes of CO_2 equivalent[2] – that's three to four times more than the UK's total annual greenhouse gas emissions today.[3]

Supermarkets are the biggest source of HFC emissions in the UK, even though there are HFC-free alternatives. These alternatives are sometimes referred to as 'natural refrigerants' and include CO_2, ammonia and hydrocarbons.

HCFCs (hydrochlorofluorocarbons) are the class of refrigerant used prior to HFCs; they also have a high climate change impact and contribute to the destruction of the ozone layer. The use of 'virgin' HCFCs was banned in Europe from January 2010, but recycled HCFCs are still available and are used by some companies in old equipment.

2010 Chilling Facts highlights

A total of 239 stores in the UK are now using climate-friendly refrigeration. That's up from only 14 stores just three years ago.

The judges were delighted that there has been such a major improvement and that further commitments to go HFC-free have been made. We also noted that there were significant reductions in leakage, more monitoring and considerable investment in the training of engineers.

Comparing the performance of supermarkets and then ranking them on that basis has highlighted the leaders and the laggards. The gap between the two groups appears to be widening. The four supermarkets heading the pack are Waitrose, Tesco, Sainsbury's and Marks & Spencer; Morrisons, Co-operative Group and Lidl are mid-field and trailed by laggards Iceland, Aldi and Asda.

Although transport refrigeration is responsible for a small part of total emissions, we were hoping for some reductions here too. To date, however, little has been done to move away from HFCs in refrigerated transport. Disappointingly, last year's trials of more climate-friendly alternatives have not been rolled out more widely.

Air conditioning in stores has also received little attention to date; there is still a heavy reliance on HFCs and HCFCs in supermarket equipment. However, we were impressed that some supermarkets have managed to keep their stores at the right temperature without using air conditioning at all.

OTHER HIGHLIGHTS FROM THE SURVEY INCLUDE:

- In the last year, direct emissions from leaking refrigeration gases have been reduced by more than 120,000 tonnes of CO_2 equivalent – and that doesn't include reductions from Sainsbury's and Aldi[4]
- Waitrose's new climate-friendly refrigeration made significant savings in both energy and costs. In one store, it managed to reduce its refrigeration carbon footprint by a whopping 69 per cent, and the company has committed to be completely HFC-free by 2020
- Tesco now has HFC-free refrigeration in 46 stores across the UK and is introducing this technology in overseas stores too. It's also the first retailer to embrace doors for food refrigeration, with 265 express stores due to be fitted by April 2011 and a further 200 stores planned in 2011
- Sainsbury's was the first retailer to commit to CO_2 technology in all new stores, and has increased its 2014 target for rolling out this technology from 135 stores to 250
- Marks & Spencer has made significant reductions in the leakages from its equipment, and despite currently using hybrid systems containing small amounts of HFCs, has pledged that all new stores will have totally HFC-free refrigeration
- The Co-operative Group and Morrisons have committed to using HFC-free systems in all stand-alone refrigeration. Lidl has committed to using HFC-free technology in all freezer cabinets and in all new distribution centres, and Iceland is finally trialling HFC-free equipment.

4. Reduced from 1.43 million tonnes of CO_2 equivalent in 2009 to 1.31 million tonnes of CO_2 equivalent in 2010 – this is a reduction of nearly 8.5 per cent.

ASDA DISAPPOINTS

The Chilling Facts team was disappointed with Asda for declining to participate in our survey this year.

In 2007, Asda made a public announcement that it would move away from HFCs, along with Marks & Spencer, Tesco, Somerfield, Waitrose and Sainsbury's. Since then, all the other retailers who made the pledge have proven that it was more than hot air and have been making efforts to phase out HFCs.

We are concerned that Asda's disinclination to be involved in our survey indicates its lack of progress.

EIA's research, based on publicly available information, has revealed no significant progress by the company to go HFC-free. Last year, we raised concerns that the retailer had not opened any new HFC-free stores, although we did praise its efforts in reducing leakage and improving energy efficiency.

We believe that, as one of the UK's biggest retailers, it is unacceptable for Asda to ignore such an important issue. It should be lambasted for what appears to be a U-turn on previous climate commitments. And we wonder what Walmart, its American parent company which is trumpeting its sustainability policies, thinks of the UK subsidiary dragging its heels.

Chilling Facts Survey – Results at a glance

Retailer Ranking		Points (Last year's score)	Good	Bad
1	Waitrose	77/100 (60/100)	Consistent leakage reduction; 23 (11%) of its stores are now totally HFC-free; has developed an innovative system which reduces need for air conditioning and heating, cutting store carbon footprint by 69%; has set a 2020 HFC phase-out date	No progress on transport refrigeration
2	Tesco	73/100 (55/100)	Consistent leakage reduction; now has 57 stores running on HFC-free refrigeration in the UK and a further 23 outside the UK; Strong on training and information sharing; rolling out chiller doors	No efforts to move away from HFCs in transport refrigeration; inconsistent data reporting
3 ▲	Sainsbury's	68/100 (44/100)	Rapid roll-out of HFC-free refrigeration, 71 stores due by March; taking measures to address high HCFC use in stores and in distribution centres; increased its commitment to roll out HFC-free refrigeration from 135 to 250 stores by 2014	No leakage data given; high reliance on HCFCs in air conditioning; needs to do more to publicise its work
4 ▼	Marks & Spencer	65/100 (46/100)	Big reduction in direct emissions, down 16% on last year; consistent leakage reduction; will have hybrid systems in 29 stores by April; committed to going HFC-free in all new stores, with phase-out by 2030	Disappointed that it claims HFC-free air conditioning isn't 'proven'; some ongoing reliance on HCFCs; not as inspirational as we had expected – it's falling behind the other leaders
5 ▲	Co-operative Group	57/100 (19/100)	Appears to have reduced direct emissions by roughly 10% from last year; has dramatically reduced number of distribution centres running on HCFCs; some positive steps on trialling chiller doors; has responded positively to last year's survey results	Has not prioritised transport refrigeration; unnecessarily slow on air conditioning as Co-operative Financial Services is rolling out HFC-free air conditioning
6	Morrisons	55/100 (32/100)	Consistent leakage rate reductions and some innovative measures; has a bakery running on HFC-free refrigeration; some good energy saving initiatives; has hybrid systems in equivalent to 23 stores; all stand-alone refrigeration will be HFC-free	Has done nothing to address transport refrigeration; backwards attitude to chiller doors; falling behind the pack with just one totally HFC-free system planned since 2009; no long-term HFC phase-out date set and still no commitment to go HFC-free in all new stores
7 ▼	Lidl	47/100 (33/100)	Appears to have reduced direct emissions by roughly 10%; use of HFC-free eutectic plate technology in transport refrigeration; 43% of its freezers are HFC-free; doesn't use air conditioning in 96% of its stores	Ongoing reliance on HFCs in distribution centres and still no progress on HFC-free chillers
8 ▲	Iceland	38/100 (14/100)	Direct emissions are down by about 12%; finally trialling HFC-free equipment	High leakage rates for the type of systems it uses; shocked to see over 2% of refrigerant volume used are CFCs! Natural refrigerants account for a mere 0.03% of its equipment
9 ▼	Asda	15/100 (32/100)	Pleased that direct emissions are down 6.5%; carrying out a small trial of chiller doors	Has not kept up with its original commitments and refused to participate in the survey, perhaps to hide the fact that it has made little progress on this issue and considers it a low priority
10	Aldi	14/100 (6/100)	Some investment in non-HFC refrigeration across Europe	Still refusing to fill in the survey, instead giving a very brief letter with limited information

Chilling Facts – Technical points from the results

1. TRAINING

Refrigeration engineers need to be able to work safely and effectively with new HFC-free technology. The lack of trained engineers has been one of the factors slowing down the switch to climate-friendly cooling systems.

Since 2007, the number of suitably trained engineers has increased as retailers have set up or supported training initiatives. These include:

- Morrisons working with WR Training to create a CO_2 training programme, which won 'Environmental Collaboration of the Year' at the 2010 Refrigeration and Air Conditioning (RAC) Cooling Industry Awards;
- Marks & Spencer running a training school and Tesco using its CO_2 test centre in Derby to train technicians;
- Sainsbury's commissioning three technical training companies to develop a generic and hands-on CO_2 training course, which all of its 340 service engineers have either started or completed;
- One of the benefits of the simple refrigeration system adopted by Waitrose is that it reduces the need for training, although all its service engineers have attended courses on hydrocarbon safe handling, as well as specific equipment training.

While Chilling Facts applauds the retailers' training initiatives, we do have some concerns about the lack of standardisation in this area. The problem with this is that it slows down the introduction of climate-friendly technologies. And, for engineers, it's a complete muddle as they are being forced to attend courses run by individual retailers even if they have relevant qualifications from another organisation.

A City and Guilds NVQ Level 3 CO_2 refrigeration course has been in development since 2008 but is still not finalised. However, it appears that an interim solution may be around the corner; the Carbon Trust has been working with the British Refrigeration Association and the Institute of Refrigeration to create a short course suitable for service engineers. This will create some much-needed harmonisation.

2. AIR CONDITIONING

By 2015, air conditioning will be responsible for 12 per cent of global HFC emissions.[5] However, for supermarkets the carbon footprint from these cooling systems is much smaller than from their refrigeration. Marks & Spencer, for example, reported that leakage from its air conditioning contributed to only 0.5 per cent of its total greenhouse gas emissions, and for Morrisons the figure was a fraction of this.

One of the most worrying factors about supermarket air conditioning is that some companies are still heavily reliant on ozone-destroying HCFCs, notably Marks & Spencer, Morrisons and Sainsbury's. We believe that all HCFC-dependent technologies should be replaced immediately – and that this would be an ideal opportunity for retailers to leapfrog HFCs and adopt climate-friendly systems.

5. Technical and Economic Assessment Panel (2009) "Assessment of Alternatives to HCFCs and HFCs and Update of the TEAP 2005 Supplement Report Data" Task force Decision XX/8 Report.

Morrisons has stated that, where it does use air conditioning, it intends to replace its HCFC systems with HFC-410a, which has a global warming potential (GWP) of 2,340. This is a lost opportunity which cost Morrisons points in our survey.

The Waitrose system caught our eye for the opposite reason. The company has taken an holistic approach to refrigeration and cooling, which particularly impressed us. Cooling predominantly comes from retrieving cold air from refrigeration aisles; in some stores where there isn't enough cool air, air conditioning is powered by chillers which are increasingly run on hydrocarbons. To date, Waitrose has HFC chillers in just eight stores.

Sainsbury's is also looking at retrieving cool air from the base of chiller cabinets, while Tesco has fitted heat rejection and absorption chillers in six stores and is developing hydrocarbon-based systems.

Chilling Facts supports supermarket initiatives that avoid the use of air conditioning wherever possible. But if it has to be used they should be switching to HFC-free technologies as soon as possible – and the continued use of HCFCs is totally unacceptable.

3. TRANSPORT REFRIGERATION

Last year, Chilling Facts was disappointed by how little was being done by retailers about transport refrigeration, and there has been little progress since. We think supermarkets should be moving beyond small-scale trials and introducing HFC-free refrigeration in their lorries and vans.

Sainsbury's is in the early stages of trials for CO_2 refrigerated trailers but both it and Tesco appear to favour reducing the amount of HFCs used, while improving on fuel economy. Tesco, for example, uses an electric plug-in facility for loading at its new distribution centre, and Sainsbury's new trailers are 30 per cent more fuel efficient than their predecessors.

4. CHILLER DOORS

The use of chiller doors in supermarket refrigeration is a big energy-saver. It will cut energy use in both chilling and freezing foods, as well as for heating stores that have been cooled by their refrigeration systems. Research by the Carbon Trust estimates that chiller doors can save 12-30 per cent in energy use, or approximately 150 tonnes CO_2e per store,[6] but supermarkets have been reluctant to introduce doors because they believe it will reduce sales.

Tesco has made the biggest commitment in this area, with 265 stores due to be converted by April 2011 and a further 200 stores planned in 2011. So far it has prioritised its small format 'express' stores but the next batch will include 5-10 of its larger retail outlets.

Co-operative Group has a more modest five stores already converted, with more planned. But Morrisons and Lidl have both declared that they have no plans to change from their current systems because they are concerned about the potential negative impact on sales.

Sainsbury's, Marks & Spencer and Waitrose are all trialling chiller doors, although Waitrose is worried they might compromise its system for recycling cool air.

5. INNOVATION

SAINSBURY'S GEO EXCHANGE

This exciting project in Sainsbury's largest store at Crayford, in Kent, uses ground coupling to improve heating and cooling. The system uses boreholes drilled 200m underground to store waste heat from refrigeration, which provides heating and hot water for the store. In addition to eliminating the need for gas heating, the Geo Exchange also reduces the store's energy needs by about 30 per cent and improves the efficiency of its CO_2-based refrigeration systems. Sainsbury's installed a similar system at its Greenwich store in 1999; let's hope it doesn't take it another 10 years to roll the next one out.

WAITROSE'S SIMPLE SYSTEM

Waitrose won 'Retail Project of the Year' at the 2010 Cooling Industry Awards for its innovative and simple refrigeration system. In addition to refrigerating food, this is a totally HFC-free technology that provides both heat and air conditioning to stores.

Water cooled by a mixture of heat reclamation and hydrocarbon chillers on the roof removes the heat rejected from the stand-alone refrigeration units in the store. The heat recovery has reduced the gas used for heating by 70 per cent, as well as cutting the number of boilers needed. This has led to a 69 per cent reduction in CO_2 emissions from a sample store.

The Chilling Facts team thinks this technology has further potential in countries with warm, humid climates. The factory-assembled stand-alone systems are reliable as well as being easy to install and maintain. Waitrose has reported a 50 per cent reduction in maintenance costs.

MORRISONS PORTABLE CO_2 PLANT

This innovative idea won Morrisons a Cooling Industry Award for 'Refrigeration Innovation of the Year'. The plant provides a standardised CO_2 condensing pack that can be moved from store to store to provide temporary refrigeration while any refurbishments are taking place.

6. Carbon Trust (2010) "Refrigeration Road Map" http://www.carbontrust.co.uk/Publications/pages/publicationdetail.aspx?id=CTG021

Government action needed

Chilling Facts believes the Government should be doing more to tackle the climate change impacts of refrigeration and air conditioning. Here are three things it could do – and why they would help:

1. SUPPORT A EUROPE-WIDE HFC PHASE-OUT

The European Union's (EU) F-gas regulation seeks to prevent leakage of all F-gases, including HFCs. In 2011, the legislation is up for review.

It appears that the current regulation is poorly implemented and has low compliance throughout Europe, making it both costly and inefficient. Research by consultants shows that a scheduled phase-out of HFCs would be a much better way of meeting Europe's greenhouse gas reduction commitments. We urge the Government to not only support any future proposals to phase out HFCs within the EU, but to ensure that these are environmentally ambitious.

Chilling Facts' own research shows that UK retailers are ahead of their European counterparts in phasing out HFCs. This will put them in a strong position to meet any challenging targets set by legislation. And we believe that they should demonstrate their commitment by encouraging governments to tighten time scales for phasing out HFCs.

2. TAX THE USE OF HFCS

Taxing HFCs can help reduce leakage and demand, helping pave the way for an HFC phase-out.

HFC taxation uses a similar principle to carbon pricing. HFCs are be taxed according to their GWP, using an agreed carbon price; if the carbon price is £10 per tonne of CO_2, one kilo of HFCs with a GWP of 2000 would be taxed at £20.

This system has been introduced in some Scandinavian countries, such as Denmark and Norway, since the early 2000s. It has been remarkably effective at reducing HFC emissions and use. The Swedish Environmental Protection Agency points out that it would not only support a switch to more climate-friendly refrigeration, but would raise several million pounds a year. Some of this income could be invested in HFC destruction and training initiatives.

Surprisingly, the idea of an HFC tax is popular with many retailers, including the Co-operative Group, Marks & Spencer and Tesco.

3. STANDARDISE AND SUPPORT TRAINING COURSES FOR REFRIGERATION ENGINEERS

The current lack of harmonisation between the courses run by retailers is creating problems for the servicing industry. Chilling Facts has recently leant that the Carbon Trust is about to launch a short CO_2 course, suitable for service engineers. This will standardise training across the industry and should help tackle the problem. and deserves ongoing government support

Conclusion

The rapidly increasing roll-out of HFC-free technology by major retailers is proof that climate-friendly refrigeration is viable and makes business sense. This year's Chilling Facts survey marks a shift in the industry, with HFC-free moving into the mainstream. The next step is for those who have not yet done so to set HFC phase-out dates. So far, Marks & Spencer and Sainsbury's have committed to 2030 and Waitrose to 2020 – it's time for others to not only follow suit but to push the boundaries.

The next few years will herald big changes in the way HFCs are regulated, both in Europe and globally. Retailers which act now ensure the transition from HFCs will be smooth for their business. While most supermarkets identify this as a priority, we are concerned and perplexed as to why others continue to drag their heels. Perhaps they're waiting for economies of scale driven by more environmentally responsible retailers' commitments?

If so, it's a 'penny wise, pound foolish' approach which will ultimately leave them facing a far more daunting task when the use of HFCs is banned.

About the Chilling Facts Survey

The Chilling Facts supermarket survey and league table has been compiled from data gathered from three sources:

1. Supermarket responses to the Chilling Facts questionnaire sent out by EIA in October 2010;
2. Correspondence with retailers and brand suppliers;
3. Publicly available material on retailer and supplier websites.

Questions were asked about which cooling gases and systems are used for both air conditioning and refrigeration in stores, distribution centres and transport. The survey also covered training, energy efficiency, leakages and future plans.

The results were analysed by the campaign steering group comprising Fionnuala Walravens (EIA), Nick Cox (Earthcare Products) and Julia Hailes (independent consultant and writer). They created a score sheet with a range of issues and ranked each supermarket's performance accordingly. A detailed breakdown of how each supermarket scored in each category is available in Appendix one.

It should be noted that although we have made every effort to be objective, EIA does not in any way claim the survey to be a scientific analysis. The results simply represent the views of EIA and the members of the steering group. We are grateful for the assistance we have received from both retailers and brand suppliers.

THE STEERING GROUP

FIONNUALA WALRAVENS

Fionnuala is EIA's Global Environmental Campaign Leader. She is a leading authority on the inter-linkages between ozone and climate policies. As part of her work on the campaign, Fionnuala regularly attends international ozone and climate talks where she is part of a team lobbying for global action on HFCs. She is also a member of the European Commission's Expert Group on Fluorinated Gases.

JULIA HAILES MBE

Julia is a leading opinion-former, freelance consultant and speaker on social, environmental and ethical issues. She is the author or co-author of nine books, including The Green Consumer Guide which sold more than one million copies worldwide and, more recently, The New Green Consumer Guide, published in 2007. In 1999 she was awarded an MBE. Visit her website at www.juliahailes.com.

NICHOLAS COX

Nicholas is Managing Director of Earthcare Products Ltd and is considered a leading authority on environmentally friendly refrigeration and air conditioning. During a long career, he has presented many papers on refrigeration and coolants as well as advising both the UK government and the European Commission.

	Waitrose	Tesco	Sainsbury's	Marks & Spencer
Section 1 Emissions	Pleased to see direct emissions are less than indirect and significant reductions in direct emissions from last year, but note no change in indirect emissions. Comparatively higher emissions than some other retailers but also proportion of refrigerated retail space.	Difficult to judge this year due to different reporting. No reductions in direct emissions from leaking refrigerants, which is our area of focus.	The first year it has supplied any information; however, has not supplied direct emissions which makes it tough to compare direct with indirect. Similar indirect emissions to Tesco but with less than half the number of stores.	Heading in the right direction, with direct emissions lower than indirect. Happy to see significant reductions on last year with direct emissions down 16%. Honest and complete reporting.
	7	4	3	9
Section 2 Leakage	We still like the mystery leak technician concept and cherry and almond scent and note difficulties experienced in getting manufacturers to produce the scented HFCs. Has consistently reduced annual leakage rates from about 20% in 2005 to 11% last year.	Improved leak-detection systems with consistent year-on-year leakage rate reductions, from 19% in 2006 to 11% in 2010.	Claims to have an open information policy in which it shares learning from leakage with contractors and manufacturers; however, it doesn't share leakage rates, so hard for us to judge progress. Some good initiatives and clearly this is an area of focus for Sainsbury's. We like its innovative predictive maintenance.	Has implemented a leakage reduction programme and achieving steady year-on-year reductions, good work.
	8	8	7	8
Section 3 Use of natural refrigerants in store	Has fitted 23 further stores with hydrocarbon water-cooled systems in 2010, bringing the total proportion of HFC-free stores in its estate to 11%.	Converted 46 UK stores (comprising 276 systems) to CO_2 in one year, up from six store conversions last year and five before that, bringing the total number of stores in the UK to 57. Now has a further 23 CO_2 stores outside the UK. Very impressed that it is fulfilling pledges made last year.	Volume of natural refrigerants used has increased dramatically from 0.2% to 4.2% in one year. Very impressive roll-out with a total of 71 CO_2 stores by end of March 2011; disappointed that it hasn't done more to publicise this great work. Is addressing its HCFC use, has reduced by a quarter but almost 1/5 of total refrigerant volume is still HCFCs. Very good result but ongoing HCFC use lost it a point.	Increased natural refrigerant use from 1% of total refrigerant volume to 4% use of naturals; however, hasn't reduced the amount of HCFCs in stores. Plans to have 29 stores running on hybrid CO_2 systems by April 2011.
	9	9	9	6
Section 4 Use of natural refrigerants behind the scenes	100% ammonia with free cooling and heat reclaim used. Top marks.	100% of distribution centres are running on natural refrigerants. Top marks.	Big improvement on last year, with 91% of distribution centres planned to be running on natural refrigerants by April 2011.	75% of distribution centres are using naturals and the rest on HCFCs, with plans to convert by 2014; quite slow.
	10	10	9	7
Section 5 Use of natural refrigerants in transport refrigeration	0.3% of fleet using hydrocarbons; no progress since last year despite promises.	Has installed plug-in facilities to reduce energy use when loading and use trailers with reduced charge size and better containment but no efforts to move away from HFCs.	Impressed by its efforts and trialling of lots of new ideas. Main fleet now using smaller charge, more energy-efficient HFC trailers.	Trialling nitrogen-based system; however, we're concerned about the high footprint of nitrogen.
	2	4	6	4
Section 6 Training and Technical	Has developed a simple system which doesn't require much training, an ideal situation as it makes the systems much easier to work on. All engineers go through a hydrocarbon and equipment-handling course.	Has headed up a City and Guilds CO_2 training qualification due out in mid-2011 and is running an interim course. It has established an information-sharing agreement with Carrefour and Walmart. Very proactive.	Has developed a training course which 50 engineers have already completed with remaining engineers in process of completion.	Involved in development of City and Guilds course and BRA and has its own training school.
	7	8	7	7
Section 7 Use of natural refrigerants in air conditioning	Clever use of heat reclaim and free cooling have eliminated the need for air conditioning in all but eight stores, which still used HFC-based systems; however, these will be replaced as part of its HFC removal retrofit programme. We're impressed by the energy-saving aspects of this approach. Spot on, a model for others to follow.	One hydrocarbon chiller in a store, developing other innovative measures to avoid HFCs and make use of waste heat; however, still on a small scale.	Worryingly heavy reliance on HCFCs, at almost 70% of total refrigerant volume; lost points on this. Planning to design down need for heating and ventilation using free cooling has rolled out in about 35% of stores.	Emissions from air conditioning are a small proportion of its carbon footprint. Trialling hydrocarbon-based systems in two stores; however, claims that HFC-feel systems are 'not proven', despite their use by Waitrose and availability since the mid-90s. Lost a point for its reliance on HCFCs.
	9	6	6	5
Section 8 Energy efficiency	Efficiency measures saved 22% energy per sq ft, up from 20% last year. Monitoring a limited trial on fridge doors, has raised concerns that these may reduce cool air recovery ability.	Reports a 5% reduction in refrigeration energy use since 2009. First retailer to roll out doors on chillers, with 265 express stores due to be fitted by April 2011 and a further 200 stores planned in 2011, including larger format stores. We're really impressed with how much it's done on chiller doors; others retailers should take note.	Project reset has saved about 16% of overall store energy use in targeted stores; is rolling this out wider. Like its geothermal heat exchange project which generates renewable energy for refrigeration and eliminates heating requirements; we encourage its wider roll out. Has trialled doors and disappointingly appear to reject them but recognises the need for doors on wine chillers.	Efficiency measures have resulted in 19% energy savings per sq foot; this includes energy savings of 10% from medium GWP refrigerant use. Limited trial of glass doors in 2011.
	7	8	5	7
Section 9 Future plans	Board of directors has committed to removing 100% of all HFCs from all new shops and cold stores, with a total phase-out from entire estate by 2020, 10 years ahead of the rest.	Committed to HFC-free systems in all new stores and on track to meet last year's commitment to convert 150 stores by 2012, but vague on long-term goals. Pleased to see its roll-out across Central Europe.	Has increased its commitment to roll-out HFC-free refrigeration from 135 to 250 stores by 2014; will trial HFC-free system in convenience store in 2011. Has commited to an HFC phase-out by 2030. However, no plans to go HFC-free in air conditioning as yet.	Committed to HFC-free systems in all new stores, with total HFC phase-out by 2030. Has made plans to reduce refrigeration gas carbon emission by 50% by 2015; however, this isn't such a challenge given its shift to a medium GWP HFC.
	10	8	9	7
Section 10 Bonus score	We like its simple system which saves energy, costs and prevents the need for air conditioning in stores. Not enough progress on transport refrigeration, though.	Really impressed by international roll-out in Hungary, the Czech Republic, Poland, Korea, Malaysia, Thailand and the US and its lead on the sustainability work of the Consumer Goods Forum. Pleased to hear that the CO_2 incident has not damaged its commitment to natural refrigerants.	Impressed with its commitment to rolling out HFC-free refrigeration. Pleased to see it has removed an advert for an HFC product on its website. Needs to do more in publicising its work within the industry and keep improving data transparency.	Has failed to keep up with increasing competition from other retailers; slow progress on shifting from hybrid to HFC-free systems. Not as inspirational as it should be, it made a positive start when launching Plan A although doesn't appear to have progressed much since. But we like big direct emissions reductions since last year.
	8	8	7	5
Total score	**77**	**73**	**68**	**65**

Co-operative Group	Morrisons	Lidl	Iceland	Asda	Aldi
Appears to have reduced direct emissions by roughly 10% from last year. Emissions associated with energy use are about average.	Great to see some figures this year; however, they are on the high side, although what it's given includes emissions from air conditioning and manufacturing and distribution .	Despite increased number of stores, direct emissions from leaking refrigerants have dropped by about 10% compared to last year. However, emissions from energy have increased inline with number of extra stores.	Despite an increased number of stores, direct emissions are down by about 12%. Energy-related emissions have increased in line with extra number of stores.	Refrigerant emissions were reduced by 6.5% from 2008 to 2009, and electricty use is down by 3.5%; however, electricty used for refrigeration isn't reported separately .	No information given.
7	5	7	7	5	
Having taken over Somerfield, it is prioritising worst-performing sites for refurbishment, achieving a dramatic reduction in leakage emissions. Good work but this was an easy win.	Some innovative measures, also using scented HFCs, and pleased to see a reduction in leakage rate from 19% last year to 14%, and down from an eye-watering 39% in 2005.	Leakage rate information not given. Uses basic measures to reduce leakage; however, claims to keep store installations simple in order to reduce piping.	Leakage rates of 8% seem quite high for mostly de-centralised systems, and no innovative measures to reduce leakage.	No information given.	Claims to have designed systems which reduce refrigerant volumes but no further information given.
8	8	5	5	0	4
Just over 5% of total refrigeration runs on naturals. Pleased to see a reduction in the amount of HCFC use, down from 15% to 5% this year. Like its increasing use of HFC-free stand-alone equipments. Some small extension of CO_2 systems.	Plans to replace all HCFC systems by end of 2011. Has committed to going HFC-free in all stand-alone units. Continuing roll-out of hybrid HFC-CO_2 systems, with 70 systems (equivalent to about 23 full stores) in place this year and a further 20 planned. Just over 5% of its refrigeration systems are now using hybrid technology.	Pleased to see 43% of freezers are HFC-free; why are its chillers still running on HFCs?	Shocked to see over 2% of refrigerant volume used are CFCs! Still using HCFCs too, with natural refrigerant accounting for a mere 0.03%. One point for disclosing data but that's all, very disappointing.	No information given.	Has removed all HCFCs from stores and moving to naturals in freezers; no progress on chillers.
8	6	6	1	0	5
Great improvement since least year, has reduced number of distribution centres running on HCFCs from over half to just 5% and now has over a quarter running on natural refrigerants.	90% of distribution centres running on naturals; however, remaining refrigerant use is HCFC. We're impressed by its new bakery which runs on naturals.	25% of distribution centres running on naturals, rest on HFCs, no change since last year.	No change since last year, with 84% of distribution centres running on ammonia, and lost points for HCFC use.	No information given.	Recent distribution centres have used ammonia; very vague response.
4	9	2	7	0	2
It has not prioritised this but has made efforts to reduce fuel emissions.	Totally reliant on HFCs with no plans to change this, a point for answering the question but very disappointing.	Uses a mix of HFCs and Eutectic plates. We like its use of eutectic plates, which eliminate the need for frozen goods transport containers.	Totally reliant on HFCs; one point for answering the question.	Walmart Facts claims ASDA (UK) reduced transportation fleet carbon emissions by 40% through the use of new technology, consolidated supplier deliveries and increased use of rail transportation. Not clear if this is from avoided HFC use.	No information given.
3	1	6	1	4	0
Its use of simple stand-alone technology reduces need for training; claims it is planning to run a CO_2 course in future but yet to start.	Has worked with partners to create an award-winning course which all engineers will attend; however, not as pro-active as some of the others.	Not involved in this aspect. Again, high use of stand-alone equipment means less need for training.	No training is given; however, uses lots of stand-alone equipments, so not much need.	No information given.	No information given.
4	6	4	4	0	0
Claims this area is part of overall plan to move away from HFCs but doesn't appear to be doing much about it. Some limited trials of hydrocarbon systems but we are disappointed that it is still so far behind Co-operative Financial Services, which is rolling out HFC-free air conditioning.	Like its policy to avoid air conditioning where possible and we recognise that it has taken on an older estate with lots of HCFCs; however, Morrisons has missed a golden opportunity to leapfrog HFCs here but instead plans to convert to HFCs where air conditioning is being used. Very disappointing.	Pleased to see that Lidl doesn't use air conditioning in 96% of its stores. We encourage it to switch what systems it does have away from HFCs.	Doesn't give information about type of gas used but mentions use of free cooling from heat rejection.	No information given.	No information given.
3	5	7	3	0	0
It expects to see a 20% reduction in refrigeration energy use since 2007; very positive. Has been trialling chiller doors in five stores and seems keen to roll them out further next year. Good work.	Some good initiatives, with savings of about 6.5% since 2009. Appears to have trialled chiller doors and rejected them.	All freezers have lids; has trialled doors on chillers and found them to have a negative impact.	Uses doors on almost all frozen food, now standard amongst retailers. Some energy-saving measures which have saved 8% over past five years; new stores are using 18% less energy than older ones.	Its blog shows it is running trials with doors on all fridges and freezers in seven stores and has had mixed customer reactions. Claims to have decreased Asda's overall carbon footprint by 5% from 2008 to 2009.	No information given.
8	6	3	5	6	0
Has pledged to make refrigeration in all new stores HFC-free but won't stop using HFCs in refits until 2015; we're not impressed. Pleased to see its commitment to stop using HFCs by 2030, which is becoming an industry standard.	Falling behind the pack with just one HFC-free system planned since 2009. No long-term HFC phase-out date set and still no commitment to go HFC-free in all new stores. Pleased to see all its stand-alone equipment going HFC-free, though.	Has committed to going HFC-free in distribution centres and freezers; not much of a challenge as most retailers are there already.	Finally shifting to HFC-free freezers, a long overdue achievement.	No information given.	Claims to be investing in non-HFC refrigeration across Europe, but no further details given.
6	4	3	3	0	2
Has called for a review of carbon pricing, eg, an HFC tax; we support this. Feel it has responded positively to last year's survey results.	It has received numerous industry awards for projects and an innovative portable CO_2 pack, yet its survey responses don't seem to reflect all this.	Hasn't made much progress since last year but good on air conditioning.	A slight improvement on last year.	Dissapointed it didn't participate but we have done our best to find out as much as we can to be fair to it.	We like their European investment.
6	5	4	2	0	1
57	55	47	38	15	14

Artwork by Clifford Singer

www.ChillingFacts.org.uk

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