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BRITISH REFRIGERATION ASSOCIATION

Code of Conduct for carbon reduction in the retail refrigeration sector

Rationale

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Executive Summary

Retail refrigeration systems are a significant contributor to UK carbon emissions, producing around 7.3 million tonnes of CO_2 equivalent ($MtCO_{2e}$) per year. Operating these systems leads to greenhouse gas (GHG) emissions via two main routes:

- Indirect GHG emissions, associated with the generation of energy used to operate the system.
- Direct GHG emissions, associated with the escape of refrigerants due to leakage or incorrect handling during installation and maintenance.

The retail refrigeration sector recognises this problem and many people have already sought to address it at an individual company level. However, in order to make a step change, a co-ordinated, sector-wide approach is required. This has led to calls for a voluntary Code of Conduct for carbon reduction, written by industry, for industry.

The Code has been written by industry stakeholders who, together, represent the breadth of skills and knowledge in the retail refrigeration sector, and whose approach to this work shows the strength of knowledge and willingness of industry to take the lead in specifying best practice in reducing carbon emissions. Contributors range from heads of refrigeration at leading UK supermarkets, manufacturers, contractors and trade associations, to highly skilled technical experts and strategy advisors.

Widespread adoption of the Code is projected to reduce CO_{2e} emissions from retail refrigeration by around 20% over 5 years. It will also assist those companies adopting it in:

- **Adhering to regulatory requirements**
- **Meeting voluntary targets, such as those set by the Consumer Goods Forum**
- **Making significant financial cost savings**

The Code comprises three parts: the Rationale, the Best Practice Guide and the Technical Specification. Together, these documents outline the standards that retailers and contractors should be aspiring to reach.

A word from industry representatives

As Presidents of the British Refrigeration Association (BRA) and Institute of Refrigeration (IOR), we are pleased to recommend the Code of Conduct for carbon reduction in the retail refrigeration sector. The Code is a practical guide to best practice that succeeds in its task of bringing together a vast amount of information in a single, simple-to-understand format. It will no doubt become the first port of call for key decision makers in the retail refrigeration sector as they determine company strategy on refrigeration procurement, installation and maintenance.

Bob Arthur
(President – BRA)

Andy Pearson
(President – IOR)

Introduction to the Code of Conduct for carbon reduction in the retail refrigeration sector

Aims and objectives

The Code of Conduct for carbon reduction in the retail refrigeration sector (referred to here as the Code) aims to provide a sector framework for carbon reduction. In the long term, it is hoped that the Code will provide a blueprint for retailers and contractors to reduce direct carbon emissions from refrigerant leakage and indirect emissions from generating electricity to power refrigeration systems in the retail sector.

The Code is expected to lead to a reduction in CO_{2e} emissions from retail refrigeration by around 20% over 5 years, from 7.3Mte to 5.84Mte. It will also assist those companies adopting it in:

- Adhering to regulatory requirements
- Meeting voluntary targets such as those set by the Consumer Goods Forum
- Making significant financial cost savings

The aims and objectives of the Code are to:

- provide a framework that encourages all parts of the retail refrigeration sector to improve the energy efficiency and reduce the carbon emissions of refrigeration systems
- establish a forum where the retail refrigeration sector, trade bodies and Government departments can discuss issues and needs, and plan for the future
- enable the retail refrigeration sector to demonstrate voluntary action through participation in, and endorsement of, the Code.

The best practice areas included are:

- training and skills
- containment
- buildings
- testing and inspection.

These areas are considered to be the highest priority for development at present. However, it is recognised that there are many others which are important to the sector and a number of these have already been identified as priorities for future development.

The Code

The Code comprises three parts: the Rationale, the Best Practice Guide and the Technical Specification. Together, these documents outline the standards retailers and contractors should be aspiring to reach, while ensuring they are still practicable and attainable.

The Code is not the result of 'blue sky' thinking. It is a set of practices that are already used by some organisations in the sector, but have not yet been adopted as common practice across the board. It is hoped that the Code becomes part of everyday use by the sector when designing, commissioning, installing, operating, servicing and maintaining retail refrigeration systems. When best practice becomes common practice, significant improvements in energy efficiency and reductions in carbon emissions can be achieved.

Code of conduct for carbon reduction in retail refrigeration

Rationale

Best Practice Guide

Technical Specification

Why adopt the Code?

Adopting the Code will allow the retail refrigeration sector to demonstrate voluntary action to reduce carbon emissions as opposed to requiring new legislation by Government to drive actions and improve outcomes. To this end, it has already been incorporated into the BRE Environmental Assessment Method (BREEAM) 2011 building assessment methods.

The Code aims to be a time-saving tool that brings together multiple sources of information endorsed by refrigeration sector. It offers users a single, reliable, and easy-to-use source of information and removes the need to access multiple documents or seek multiple opinions and recommendations from industry peers each time a key decision needs to be made.

Those companies adopting the Code will benefit from the cost savings associated with lower energy consumption, as well as a reduction in exposure to fluctuating fuel prices. This will provide a significant competitive advantage in achieving the targets set out in the Carbon Reduction Commitment Energy Efficiency Scheme.

How to use the documents

The Code comprises three parts: the Rationale, the Best Practice Guide and the Technical Specification. Each of these documents has a distinct purpose as outlined below.

Rationale

The Rationale is aimed at management teams and non-technical staff. It explains why a code of conduct is needed, the context in which it should be used, and the likely outcomes that may be achieved by adopting the recommendations.

Best Practice Guide

The Best Practice Guide offers a series of recommendations for industry practitioners to sign up to and follow to help to help them achieve their carbon reduction targets. It outlines the expected levels of achievement, for example cost-effective and achievable processes, routines and skills, and should serve as a checklist that enables users to monitor their progress against the benchmarks provided. It is aimed at technical staff capable of implementing the recommendations directly or through the teams they manage.

Technical Specification

The Technical Specification provides additional information for technical staff. It is a detailed reference document designed to serve as an appendix and provides supporting information and data sources pertaining to the Best Practice Guide. It will assist the sector in understanding the more technical aspects of the various activities involved in the design, installation, commissioning, operation, and service and maintenance of retail refrigeration systems by signposting to further sources of information.

For detailed information on potential energy and cost savings relating to specific technologies, please refer to the Refrigeration Road Map[1].

1www.carbontrust.co.uk/Publications/pages/publicationdetail.aspx?id=CTG021&respos=0&q=refrigeration+road+map&o=Rank&od=asc&pn=0&ps=10

Why the Code is needed

There are about 5,000 supermarket refrigeration systems in the UK, which account for around 7.3 million tonnes of CO_2 equivalent ($MtCO_{2e}$) being emitted to the atmosphere per year. The Code aims to reduce this amount by encouraging the sector to adopt good working practice in the design, installation, commissioning, operation, and service and maintenance, of retail refrigeration units. It is hoped that all users of retail refrigeration systems can build on the work they have already undertaken. It is known that all of these best practices are being implemented by the sector and the aim of the Code is for best practice to become common practice, thereby dramatically reducing the sector's carbon emissions.

The refrigerants used in most refrigeration systems in UK supermarkets are hydrofluorocarbons (HFCs) (especially 404A), although hydrocarbons (HC) are being trialled with secondary refrigerants and CO_2 is gaining market share. The Code seeks to address each of these areas, where relevant, to ensure the recommendations it makes are widely applicable across the sector.

It is important to recognise that the impact of the Code on reducing carbon emissions is expected to accrue over time. Typically, 25% of sites will be planning to buy new plant at any one time. Supermarkets tend to update refrigeration systems on a rotational basis, gradually working through their stores over a number of years before returning to the beginning. This means that most procurement teams will be in a position to consider new refrigeration solutions in at least some of their stores.

The impact of this purchasing pattern on the adoption of Code recommendations is twofold. It makes it feasible for retailers to experiment with different refrigeration systems in different locations, rather than being tied to a single supplier or approach nationwide. This enables innovative retailers to trial the Code's recommended practices before rolling them out across all stores. The disadvantage is that it is a challenge for retailers to keep up with fast-changing technology. Procurement teams rarely have sufficient time between refits to carry out a detailed cost-benefit analysis of multiple technologies, creating a tendency to stick with what they know rather than what is the most cost-effective and has the least environmental impact.

A further consideration is the fact that 70% of sites rely on contractors for design advice. Therefore, it was important to involve industry representatives from this group during the Code's development. It was also important for the project team to understand and incorporate the relationship between retailers and contractors, and how this influences decision-making around design, commissioning, installation, service and maintenance, and operation of refrigeration systems.
How the Code was developed

A clear remit

An industry-wide consultative approach was taken so that all parts of the supply chain from manufacturers and contractors to end users were involved in writing the Code. This was coupled with the application of a strict methodology across every aspect of the project to ensure consistent quality of output. The recommendations developed aim to meet the following vital criteria:

- practicable and implementable across the sector
- cost-effective today and/or likely to lead to lower costs in future
- based on best practice from the sector, making use of existing work and aligning to existing initiatives or processes where appropriate
- take advantage of the opportunity to coordinate industry and demonstrate that it is able to self-regulate
- contribute to the delivery of a persuasive and consistent message to the members, policy makers and wider public associated with the retail and refrigeration industries.

Stakeholders involved: The Carbon Trust; Department of Energy and Climate Change; Department for Business, Innovation and Skills; Department for Environment, Food and Rural Affairs; Summit Skills; the British Refrigeration Association; the Institute of Refrigeration; the British Retail Consortium; the Federation of Environmental Trade Associations; and representatives from industry including major supermarkets, convenience stores, equipment manufacturers and contractors.

Widespread industry engagement

The Code was developed by an industry-led steering group. This group was drawn from a wide cross-section of the refrigeration and food retail industry, appropriate Government departments and trade bodies.

The stakeholders involved in designing, writing and editing the Code included a broad range of representatives from industry, major supermarkets, convenience stores and equipment manufacturers to high-profile contractors.

Identification of key focus areas

Once the overarching structure of the document had been agreed, four working groups were established to support the development of the content for the Code. Each of the working groups was assigned an industry-based Chair and secretariat support to ensure consistent quality of output. The working groups identified 11 areas to be considered for inclusion in the Code.

Each working group was, and continues to be, represented on the steering group, which reviews its outputs for inclusion in the Code. Where appropriate, the steering group is also responsible for gathering and incorporating wider industry feedback.

The working groups focused on priority areas identified for action in the industry. Members of each group worked towards defining levels of achievement and creating a technical specification to support implementation in their specific workstream.

The four areas selected for the first iteration of the Code are:

- training and skills
- containment
- buildings
- testing and inspection.

It is likely that further areas will be added in future versions as new challenges and developments in technology come to light.

Expert input

The working groups responsible for the development of recommendations relating to each of these areas are made up of between 8 and 12 industry representatives with detailed knowledge of the area under examination. For example, those assigned to the training and skills working group were drawn from trade bodies that:

- design and oversee a range of training qualifications for professionals working in the commercial refrigeration sector
- training experts who deliver the courses
- engineers who have attended a cross section of courses
- managers from retail and contract organisations who are responsible for training their teams appropriately.

Summary and outline of next steps

Retail refrigeration units across the UK are producing around 4% of the total UK carbon emissions. The enormous amount of electricity required for supermarkets to run refrigeration units makes up around 40-70% of their total energy expenditure, depending on store size.

The Code identifies key steps to be taken now to address this. In each of the four priority areas, a series of best practice recommendations has been produced for practitioners to follow.

Training and skills

These recommendations provide guidance for those with responsibility for ensuring that the skills level of individuals and the training to achieve the necessary skills level are set at the appropriate standard. The training and skills best practice recommendations outline the formal skills and assessment through qualification that the industry should work to and the practical experience required to perform key roles. Safety, efficiency and reliability are prioritised in order to help users create the optimum working environment for their teams and customers.

Containment

Direct greenhouse gas (GHG) emissions arising from refrigerant leakage are the focus of the containment best practice recommendations. To reduce the overall GHG emissions from a refrigeration system, it is imperative that, regardless of what type of refrigerant is used, the risk of leakage is minimised. Refrigerants that are properly contained in a system do not contribute to global warming. Best practice advice in this section is focused on reducing refrigerant leakage, with an overall mission statement of 'zero tolerance to leakage'.

Buildings

In addition to addressing emissions arising from direct and indirect GHG emissions, the buildings recommendations also make reference to the BRE Environmental Assessment Method (BREEAM) building assessment for retail premises to ensure a consistent approach across industry. This section highlights the importance of designing each aspect of a building with clear reference to cause and effect on the overall building structure and services design. It covers a wide range of issues such as energy efficiency and life-cycle operation from initial construction.

Testing and inspection

The testing and inspection recommendations are focused around the most appropriate activities necessary to deliver safe, energy efficient and lowest carbon outcomes through effective testing and inspection routines. This section includes best practice around achieving consistency and quality in testing and inspection activities, improving the quality of testing and inspection procedures, and improving engagement and communication between the many parties involved.

Implementing all of the best practice recommendations outlined in these four sections of the Code will result in significant cost savings and have a huge positive impact on the environment. It is estimated that if 75% of retailers and the contractors who design, supply and maintain their refrigeration systems adopt the Code, emissions could be reduced by as much as 20% over 5 years. Therefore, it is the hope of all the participants who have contributed to this document that the best practice recommendations will be adopted across the sector, enabling the UK to lead the way in reducing carbon emissions from retail refrigeration systems.

The Carbon Trust is a not-for-profit company with the mission to accelerate the move to a low carbon economy. We provide specialist support to business and the public sector to help cut carbon emissions, save energy and commercialise low carbon technologies. By stimulating low carbon action we contribute to key UK goals of lower carbon emissions, the development of low carbon businesses, increased energy security and associated jobs.

We help to cut carbon emissions now by:

- providing specialist advice and finance to help organisations cut carbon
- setting standards for carbon reduction.

We reduce potential future carbon emissions by:

- opening markets for low carbon technologies
- leading industry collaborations to commercialise technologies
- investing in early-stage low carbon companies.

www.carbontrust.co.uk

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ACT ON CO_2 is the Government's initiative to help individuals understand and reduce their carbon footprint. Visit actonco2.direct.gov.uk for more information.

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