

# Measures to reduce CO<sub>2</sub> emissions for the food retail sector



## Introduction

This document offers guidance on the immediate steps that businesses in the food retail sector can take to help tackle climate change by reducing their carbon emissions through:

- Direct energy use associated with buildings
- Indirect energy use in buildings
- Emissions associated with commuting, business and customer travel.

The information is extracted from a detailed technical report 'Review of Measures to Reduce Carbon Dioxide Emissions', produced in January 2020 by the Tyndall Centre for Climate Change Research in partnership with Electricity North West.

## Summary

Food retailers of various sizes generally have higher energy intensity in their buildings compared to other business users because of their need to refrigerate goods. Approximately 50% of energy use in supermarkets relates to refrigeration, 25% to lighting and 20% to heating, ventilation and cooling (HVAC), although the proportion used for refrigeration is lower in larger stores.

The following measures are recommended:

1. Upgrade to the most efficient refrigeration system
2. Replace lighting with LEDs and fit motion sensors
3. Install solar panels (roof and canopy parking)
4. Install electric vehicle (EV) charge points
5. Introduce carbon literacy training for employees.

## Detailed guidance

### Energy management and monitoring

The following should be measured and targets set for making reductions:

- Specific energy consumption (kWh/m<sup>2</sup>/yr) per store and per main energy consuming process, either by sales floor area or total floor area. Best practice levels of 80kWh/m<sup>2</sup>/yr are proposed
- Lighting power density (W/m<sup>2</sup>) – this should be looked at per store and per store zone where applicable. 12 W/m<sup>2</sup> is proposed as a benchmark for supermarkets
- Energy consumption for refrigeration per metre of display case (kWh/m/yr). A benchmark of excellence of 3,000kWh/m/yr is proposed
- Calculate the percentage of refrigerant leakage in store using annual refrigerant purchases for each store and per refrigerant type.

### Implement best practice refrigeration

Options for this involve:

- Add glass cabinet doors, or air curtains and night shutters to vertical chilled food display cabinets
- Remove lighting from cabinets or replace with LED lighting
- Install flooded evaporators
- Reduce air humidity
- Install speed control for compressors
- Site fan motors outside cabinets.

### Ensure best practice lighting

Best practice lighting requires a well-controlled system that optimises the use of lights (such as motion sensors and zonal controls), and the replacement of older lamp types with LEDs.

### HVAC

The primary way of addressing energy demand for heating and cooling is through improvements to efficiency and insulation in the building fabric, specifically:

- Wall/roof/façade/floor
- Windows and glazing
- Internal and external solar shading
- Air tightness of external doors and doors between different temperature zones (including materials and seals); ensure they close quickly).

Food retailers may also have a specific opportunity to implement heat recovery from refrigeration for a store's own use or for export to other nearby stores.

In addition to the use of technology, changes in practice can also result in energy savings. For example, in winter, when customers are dressed in warmer clothing, some stores may still have the heating set to enable colleagues to wear short-sleeved uniforms. By ensuring that colleagues have seasonal uniforms, the internal temperature can be reduced, lowering energy demand.

### Increase direct use of renewables

There are various options for using renewable energy in the food retail sector which can make a contribution to emissions reduction. These include:

- Onsite rooftop solar panels
- Onsite air or ground-source heat pumps
- Solar panels installed at a separate site for specific use by the store.

Food retailers may also have the option of feeding food waste into an anaerobic digester that produces biomethane which can be used to produce electricity.

## Transport and travel emissions

Decarbonising surface transport (road and rail) is a significant priority for meeting emissions targets. In terms of carbon reporting, commuting and business travel fall into what are called Scope 3 emissions (indirect emissions that occur throughout a company's value chain).

Best practice for reducing these cover three areas:

### Colleague commutes

- Shift journeys to 'active' modes such as cycling or walking
- Shift car journeys to public transport
- Shift car use to electric vehicles by creating workplace travel plans.

### Business travel

- Reduce the need to travel by using technology instead of meetings
- Reduce travel distances by optimising meeting locations
- Reduce greenhouse gas emissions by using low carbon modes of travel
- Hold meetings in places easily accessible by public transport and rail.

### Customer travel

- Use colleague shuttle buses to bring customers to out-of-town sites
- Encourage use of public transport for accessing city centre sites.

## Recommendations common to all business sectors

Some of the key recommendations listed in the report apply to more than one business sector, for example, monitoring energy usage, using low-energy control systems and installing rooftop solar panels. Key points relating to these recommendations which apply across sectors are listed below.

### Leases

For many businesses, issues with energy and lighting management, and with rooftop solar installation can arise due to the ownership arrangement of the space in buildings eg if it rents rather than owns the building. This is particularly the case for non-supermarket retailers and offices. The Better Building Partnership highlights the relationship between owners and occupiers in terms of the responsibilities and benefits for procurement and control of energy as a key barrier to improving the environmental performance of buildings. One approach to overcome this is through the use of a 'green lease'. This is a standard lease with additional clauses that

address the environmental management and improvement of a building, making clear the responsibilities for the owner and the occupier, and is legally binding. Alternatively, a non-legally binding memorandum of understanding can be agreed between owner and occupier.

### Gains without adverse impact

Evidence suggests that reductions in energy use for lighting, temperature and air quality can be made without any adverse impact on the service being provided.

### Financial support

Qualifying heat pumps and biomass boilers can benefit from the Renewable Heat Incentive (RHI) which provides financial support to adopt low carbon heating.

### Additional low carbon power generation

Best practice for buying in renewable energy is that it should be additional low carbon power generation that wouldn't otherwise have been installed, for example, with direct purchase through a power purchase agreement (PPA). Where businesses are closely located there may be opportunities to pool resources and develop technologies that can supply multiple sites with renewable energy. Just switching to an energy retailer specialising in renewables does not directly reduce the carbon emissions of the building.

## Carbon emissions reduction potential

The potential carbon emissions reduction that could be achieved if all of the best practice recommendations are implemented for a food retail business is 25%. It should be noted that this is an average figure for diverse sectors. Even optimum reductions for an individual business will depend on a number of factors.

To see the full report, please visit [www.enwl.co.uk/decarbonise-your-business](http://www.enwl.co.uk/decarbonise-your-business).