

# Measures to reduce CO<sub>2</sub> emissions for offices

## Introduction

This document offers guidance on the immediate steps that office-based businesses 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

The nature of work conducted in offices means that their largest potential for emissions reduction is through a reduction in energy consumption. Other contributions include onsite renewable generation and low carbon travel policies for colleagues and visitors.

The three main areas of energy use in offices are heating, ventilation and cooling (HVAC), lighting and office equipment, and they are the main focus for action to reduce energy use and CO<sub>2</sub> emissions.

In summary, starting with the easiest solutions to implement, the following measures are recommended:

1. Fit solar panels
2. Replace lighting with LEDs and maximise natural light
3. Prioritise energy efficiency when replacing monitors, appliances and IT equipment
4. Install electric vehicle (EV) charge points
5. Adopt and embed energy reduction targets and behaviours.

## Detailed guidance

### Energy management and monitoring

The following should be measured and targets set for reducing:

- Specific energy consumption (kWh/m<sup>2</sup>/yr) for the office space used by an organisation (if it doesn't occupy an entire building) and per each main energy-consuming process
- Lighting power density (W/m<sup>2</sup>) for the office space and for zoned areas where applicable. In some instances lighting intensity can be reduced while improving overall illumination function.

### 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).

In addition to these measures, the Chartered Institution of Building Services Engineers (CIBSE) suggests a number of energy savings opportunities than can be realised through refurbishment:

- Increase natural ventilation and daylight
- Increase passive measures for air-conditioning
- Maximise the use of free cooling
- Remove air-conditioning completely
- Introduce zoning to enable more effective controls
- Install an efficient and fully insulated hot water system.

### Ensure best practice lighting

Best practice lighting requires a well-controlled system that optimises the use of lights (eg motion sensors, using natural light where possible), and the replacement of older lamp types with LEDs.

### Improve energy efficiency of office equipment

One of the main issues with office equipment is how it is used. The following best practice in this area is recommended:

- Colleagues to take responsibility for equipment under their control (ensuring it's turned off)
- Enable any energy saving features
- Centrally monitor IT equipment where possible
- Purchase only equipment with a high energy efficiency rating
- Control any vending machines to minimise out of hours energy use.

When considering renewing equipment, assessing the lifetime operational energy cost of an appliance as well as the upfront cost will also support a reduction in carbon emissions.

## Increase direct use of renewables

There are various options for using renewable energy in offices which can make a contribution to emissions. 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 office.

## 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.

## 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 an office-based business is 30%. 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).