

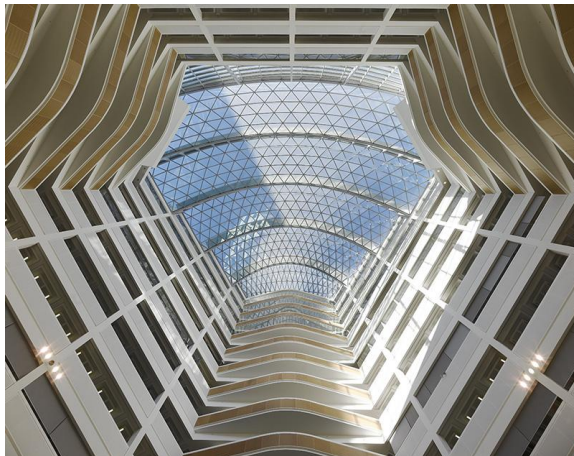
One Angel Square – Energy analysis of the Co-op Groups new Headquarters

One Angel square is the new headquarters of the Co-op Group in Manchester and allows more than 3000 staff to work in one location in an award winning low carbon office building. The building completed its first year of operation in 2013 and was officially [opened by the Queen](#) on 14th November 2013. De Montfort University provided the energy and carbon emissions analysis services for the project.



Picture courtesy of The Co-operative

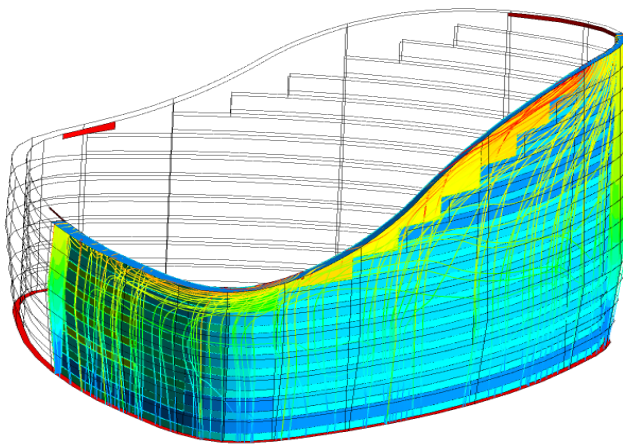
The fifteen-storey building has a triangular layout that is curved both around the perimeter and over the height of its double-skin façade. The building has a floor area of more than 40,000m² and provides large open-plan office spaces around three sides of a nine-storey atrium. The building was one of the first large office buildings to demonstrate net-zero carbon emissions and was awarded an 'Outstanding' rating under the Building Research Establishment Environmental Assessment Method (BREEAM) after achieving a world record score. The project received the BREEAM 'Best Office Building' [award](#) in 2013.



Picture courtesy of The Co-operative

The [building](#) combines a number of low-carbon technologies and design features that have allowed an 'A+' Energy Performance Certificate rating to be achieved. The building is ventilated via a large earth duct system buried below the basement and adjacent public square that allows energy to be reclaimed throughout the year. Office spaces are conditioned using displacement ventilation and chilled beams to achieve a quiet low draught environment with high air quality standards. Heating and cooling of the building is achieved using Combined Heat and Power (CHP) and evaporative cooling systems. Primary energy is derived from pure plant oil bio-fuel extracted from rapeseed grown on the Co-op's own farms. The unique double-skin glazed façade allow passive solar energy to be captured in winter and control of façade temperatures in summer.

De Montfort University's team of analysts, led by Dr Simon Rees in the Institute of Energy and Sustainable Development, have been responsible for all the energy analysis carried out during the detailed design and construction phases of the project and have undertaken Computational Fluid Dynamics (CFD) analysis of the double skin façade. This work was commissioned by project building services consultants S.I. Sealy and Hannon Associates. The university worked with project partners Forty4Consulting to demonstrate that net-zero carbon emissions could be certified and an 'A+' rating achieved.



Project Team:

Owners/Developers: Co-op Group

Architects: 3DReid

Consulting Engineers: Buro Happold

Main Contractor: BAM

Project Building Services consultants: S.I. Sealy and Hannon Associates