

Case Study – The Defence Estate reducing carbon emissions



Photo crown copyright. Two balancing ponds at the Met Office Building.

Summary

The MoD's commitment to sustainable development as well as meeting the core needs of operational capability has seen the department introduce a range of appraisal tools and assessment mechanisms. These measures have enabled the MoD to make large savings across the estate in areas such as energy consumption.

Environmental protection

The MoD is committed to holding its estate *in trust and on trust* for the Nation. Its track record is one of a balanced approach between supporting operational capability and managing this unique estate for the benefit of the Nation.

With an estate of some 240,000 hectares in the UK and annual carbon emissions from building energy used of 0.43 million tonnes, it is not surprising that the MoD takes its responsibilities for sustainable development seriously.

This means that energy and alternative sources are considered right up front in decision making and then throughout the design process. It also means that MoD has recognised the need to raise awareness and understanding of renewable sources of energy, better design, and alternative technologies. Mandating the use of sustainable development appraisal tools, a partnership with the Carbon Trust, and increased collaborate working with its construction industry partners is all part of the MOD approach.

A range of appraisal tools and evaluation methodologies have been mandated in MoD and for use by their industry partners. Strategic Environmental Assessments are used to look at the impact of programmes and plans which assess energy requirements against wider government policy objectives. Sustainability Appraisals at project level drive project managers to address the potential to improve energy efficiency, promote the use of renewables and explore procurement of energy that has been generated in

environmentally acceptable ways. At site level the application of BREEAM (Building Research Establishment Environmental Assessment Methodology) or equivalent maintains the commitment to addressing energy management. For existing buildings the MoD have put in place an energy strategy that focuses on reducing energy use through energy management systems, improved insulation, ventilation, efficient heating systems and integrating renewable energy systems.

Maintenance of Operational Effectiveness

The achievements of the MoD are perhaps best explained by illustration:

In line with a policy commitment to explore alternative sources of fuel and technology on its estate the MOD have worked with the Carbon Trust to examine the feasibility of biomass. At Castlemartin Army Training Estate in Pembrokeshire Wales a study into a small-scale wood-fuelled biomass energy generation plant (80kWe/150kWth) has been undertaken. Work is in hand to now explore with the Forestry Commission the possibilities of developing a local supply chain for biomass fuel. One potential source being looked at are the timber 'firing targets' used on the training area. There are examples also of wood chip from MoD's forests being used off site for biomass fuel.

On a number of other sites there have been introduced systems which use other renewable energy sources. For example the use of two active solar thermal systems at the Royal Marines Norton Manor Camp and a new 'ambient energy' heat pump system has recently been completed at Royal Marines Condor.

A new 'super-mess' building under construction at HMS Naval Base at Faslane is using new solar technology to harness solar energy for dining and recreational facilities for 2,500 military personnel. This work will put the naval base at the forefront of the take-up of solar technology. Three photovoltaic arrays are made up of Unisolar laminates bonded onto a Kalzip roof and will generate 49.9 kilowatt peak (kwp) of electricity.

This work supports the Government's Major Photovoltaics (PV) Demonstration Programme of medium to high scale (5-100 kwp) solar electric power installations. Mike O'Brien then the Minister of State for Energy and E-Commerce has said 'exciting and innovative projects like Faslane will help us a step closer to achieving our renewable target of 10% electricity by 2010 and into the decades beyond'.

At the Meteorological Office Building in Exeter a number of designed solutions, such as heat exchangers in the air-handling units, motion detection on the lighting, and special solutions for windows and walls are all being used to minimise energy use.

A Combined Heat and Power (CHP) plant on-site ensures a sustainable provision of power. In order to passively improve the energy performance of the building, the "TherMoDeck Ventilation System" is being used. In this system, the mass of the building is used for heating or cooling.

The incoming air passes through the concrete frame, and the cool night air chills the building in summer, while the opposite applies in winter. To reduce the usage of private cars, bus and cycle routes are provided at the site, as well as favoured parking spaces for those who participate in car sharing.