

Carbon business capabilities

Helping you move to a low carbon economy



By making maximum use of natural light, fresh air, sun and wind, CO₂ emissions at Lisneal College are calculated to reduce by 162 tonnes per annum.

Mott MacDonald is a global multidisciplinary consultancy with a strong engineering base. With annual revenue of £1 billion, we combine the skills of over 14,000 staff with a strong presence in 140 countries. We have an in-depth knowledge of the climate change debate and the opportunities and risks involved for our clients in moving to a low carbon economy. Furthermore, we have fully multidisciplinary experience in carbon finance and monetisation of projects such as Clean Development Mechanism (CDM) eligibility.

Mott MacDonald participates in global events such as UN climate change conferences and Carbon-Expo fairs and we have presented a Climate Change Charter to the UK government. Through the integration of our extensive technical and regulatory knowledge of key sectors (energy, transport, construction and water), the carbon market and low carbon technologies, we have developed considerable experience in providing key services in the carbon business arena worldwide. For the CDM market, we offer a variety of services which are designed to meet the needs of each element, including:

- Regulatory to current preparation, project design document (PDD) and methodology development through to approval
- Technical feasibility and risk mitigation advice
- Carbon finance and regulatory viability

Carbon footprinting assessments and greenhouse gas (GHG) inventories

There is an increasing demand for tools to quantify the impacts that an organisation or a project can have over its lifetime on the global climate particularly as governments introduce policies to curb emissions. The first step is to understand what and where emissions originate. A carbon footprint – or carbon accounting – is defined as the net balance in the amount of GHGs measured in units (or tonnes equivalent) of carbon dioxide (CO₂) or other GHGs associated with any specific development, business or enterprise during its lifecycle. This includes all emissions associated with energy, transport, material consumption and waste as well as any offset or avoided emissions. Understanding the sources of emissions means efficient reduction policies can be introduced.



Mott MacDonald has provided numerous due diligences for solar power projects worldwide.



Mott MacDonald's services for renewable energy technologies include landfill gas collection and control systems for waste to energy projects.



Mott MacDonald has extensive experience of hydroelectric projects around the world.



Where there are large, localised emissions, particularly from fossil fuel generation plants, there are opportunities for the capture of CO₂.

Our experience in carbon footprinting and GHG inventories – gained from major projects in energy, water, transport and infrastructure projects – places us at the forefront of this rapidly emerging market and includes:

- Carbon assessments for projects in support of environmental impact assessment (EIA) or as stand alone planning documents emphasising sustainable credentials of projects.
- Corporate carbon footprinting and data collection for use in corporate social responsibility (CSR) reporting.
- Development of tools for modelling and predicting emissions in the comparison of design options and operational scenarios of projects bringing sustainability to the forefront of the design process.

Carbon management in industry and buildings

The results of a carbon footprint assessment can be used to identify the key sources of CO₂ against targeted mitigation options to maximise the offset opportunities that can be implemented. This can be used within the planning process to show the benefits of a project compared to traditional projects and can also be used within the sustainability assessment of any new project or for CSR purposes.

Mott MacDonald's ability to integrate sector knowledge with the impacts of the carbon market allows us to provide independent advice to our clients on how to best establish, manage and reduce their carbon footprint. We are currently advising a number of players in the energy, water and transport sectors – including aluminium, cement and iron and steel producers – on how to establish and then achieve carbon reduction strategies to improve energy efficiency and reduce the emission of GHGs. We have dedicated teams that plan and design buildings to maximise the use of natural light, heat and ventilation, to integrate the use of renewables and combined heat and power (CHP) and to minimise GHGs released during construction and decommissioning. We have accredited experts that can carry out a number of relevant assessments including the building research establishment environmental assessment method (BREEAM).

Carbon finance, transactions and monetisation advisory services

The European Emissions Trading Scheme (EU ETS), the UN Clean Development Mechanism (CDM), Joint Implementation (JI) and other voluntary carbon markets have created opportunities to use financial incentives for the global reduction of GHGs. Mott MacDonald has practical experience in using carbon credits to improve the financial viability of major projects, particularly in the energy, industrial, water and waste sectors. We have also investigated the carbon abatement viability of a number of transport and construction schemes. Mott MacDonald offers the following:

- **Carbon advisory services** The full range of services required to register projects under the Kyoto Protocol's CDM/JI schemes, including PDD and methodology development, support through to approval, engagement of third-party validators and technical, financial and regulatory viability.
- **Carbon trading and emissions reduction purchase agreements advice** Support for clients on carbon transaction negotiations, including private and public bid processes and agreement negotiations.



Mott MacDonald's carbon business capabilities help enable our clients to leave the lightest possible carbon footprint.



Jatropha curcas is an important potential feedstock for biodiesel production.

- **Other carbon business opportunities and non-CO₂ emissions projects** We have a significant track record in providing regulatory advice, feasibility studies and due diligences for both CO₂ and non-CO₂ GHG offsets projects, including methane collection and destruction projects, nitrous oxide (N₂O) elimination projects through catalysers and HFC-23 incineration and disposal projects.

Regulatory and strategic advice

Mott MacDonald provides a range of carbon business services to national and local governments as they seek to manage the growth of their economies. We have been involved in the development of new emission reduction legislation and regulation in China and Eastern Europe, and the development of green building guidelines in the Middle East. We also provide adaptation strategic advisory services.

Carbon market capacity building

Mott MacDonald can provide tailored training to large and small groups on any aspect of the carbon markets. The company provides bespoke training to clients on carbon financing, CDM, JI and EU ETS.

Carbon markets – economic analysis and market modelling

Mott MacDonald can provide long-term carbon prices, including the inter-relationships between EU allowances (EUAs), certified emission reductions (CERs) and emission reduction units (ERUs). Different techniques are used including cost-engineering marginal abatement curves, optimisation and Monte Carlo models.

We are now developing analytical tools to examine the impacts of climate change policy on energy prices and consumption, GHG emissions, grid factor in power systems and social impacts. This modelling framework will incorporate both climate change mitigation programmes and adaptation impacts.

Environmental and social sustainability services

Mott MacDonald has in-house environmental consultants, social scientists and planners, allowing integration of environmental management and social responsibility on carbon projects. Environmental and social sustainability services include:

- Environmental and social impact assessments
- Site selection and permitting processes
- Management of permit applications including the PDD for registration of the CDM project to enable the sale of offset emissions
- Environmental additionality on GHG offsets
- Compliance with host country project sustainability criteria
- Stakeholder consultation, livelihood development and community engagement
- Consultation planning and implementation
- Advice on international environmental and social safeguard regulation and Equator Principle requirements



Steven's Croft is the UK's largest dedicated biomass power station. It will have an output of 44MW, supply the needs of 70,000 homes and displace 140,000 tonnes of greenhouse gases.

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CO₂ capture and sequestration projects

A major contributor to climate change is massive emissions of CO₂ from industrialised areas. Where there are large, localised, 'point-source' emissions, particularly from fossil fuel generation plants, there are opportunities to capture CO₂ and remove it from the carbon cycle through CO₂ capture and sequestration (CCS) projects. We have carried out projects to develop CCS strategies and technologies for cement plants and natural gas and coal fired power stations, as well as offshore oilfield generators, where oil and gas reservoirs are potential sinks for CO₂. While capture for geo-sequestration has been our primary focus, we also offer experience in prototype bio-sequestration technologies through algae.

Renewable carbon-offsets

Mott MacDonald is one of the leading specialist engineering and planning consultants for renewable energy technologies, utilising natural resources including solar power, offshore and onshore wind power, wave and tidal, hydroelectricity, biomass, waste to energy, landfill gas to energy and biofuels. Services we offer include:

- Resource analysis
- Gas collection and control systems for landfill to energy projects
- Market surveys (feedstock and end use markets)
- Geotechnics and underground works (for hydroelectric plants)
- Feasibility studies
- Project development
- Contractual review and financial model review

Our track record

- **Organic waste composting at Vichitbhan Plantation, Chumporn province, Thailand** The project comprised the design of a co-composting plant for waste from palm oil mills, comprising empty fruit bunches (EFB) and palm oil mill effluent (POME) from mill residues, with an initial maximum annual input capacity of 36,000 tonnes/annum EFB and 16,200m³/month POME.
- **Developing GHG reduction targets, Bulgaria** Development of GHG reduction targets, performance indicators and operation manuals and guidance for the assessment of GHG emission reductions from projects for the Bulgarian Energy Efficiency Fund.
- **CO₂ capture ready power plant, India** Investigated the costs, technology and other implications of developing a CO₂ ready ultra mega power plant of 4000MW capacity. The findings were presented at a number of workshops in India attended by potential developers, lenders and government representatives as well as staff from the British embassy.
- **GHG assessment, Russian Federation** Produced a GHG assessment for a proposed combined cycle gas turbine plant which will utilise flared gas from the regional oil fields assessing the impact on the overall carbon balance of the area.
- **CDM HFC-23 destruction project, China** Technical, commercial and carbon viability study followed by engineering, procurement and construction (EPC) tendering of construction and monitoring.
- **Cross London rail links, UK** As part of the EIA we assessed the CO₂ emissions arising from the construction and operation of this landmark cross London rail scheme.
- **Anglian and Wessex water carbon modelling, UK** We have provided bespoke modelling software to water sector clients helping them to assess the embodied and operational carbon impact of their multi-billion pound AMP5 investment plans.

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