

Climate change management is our business

With AMEC's range of skills, technical ability and knowledge, it is well placed to succeed in the growth of climate change and sustainable energy related business, a range of those opportunities are highlighted below.

Alternative fuels - Biodiesel

The continued rise in oil price coupled with the threat of energy security has provided an increased incentive for clients to invest in alternative fuel sources. AMEC's skills are being utilised to bring these alternative solutions to the market place.

In October 2007 AMEC was awarded a contract by Beard Energy to provide engineering and project management services for the front-end engineering and design (FEED) phase of the US\$5 billion Ohio River Clean Fuels project in Wellsville, Ohio. The project is being undertaken in response to growing demand for more environmentally-friendly fuels. The facility is expected to produce approximately 50,000 barrels per day of jet and diesel fuel and other liquid products from biomass, coal and other feedstock. The new facilities will capture at least 80 percent of the carbon dioxide produced during refining. Much of the captured carbon dioxide will be used for enhanced oil recovery in the nearby Appalachian oil fields,

with the remainder to be stored in underground caverns.

AMEC is working with a client on a plan to design and construct a pyrolysis plant in Canada, turning waste into synthetic diesel fuel. Fast pyrolysis is a process in which organic materials are rapidly heated to 450-600°C in absence of air this produces organic vapours, pyrolysis gases and charcoal. After cooling and condensation, a synthetic oil is formed which has a heating value about half that of conventional fuel oil. Typically, 70-75 wt.% of the feedstock is converted into oil. The gas by-product can be used within the process to provide the heat requirements so there are no waste streams other than flue gas and ash. The project has the capability of diverting some 30,000 tonnes of waste from landfill and transforming it into 11,000 tonnes of diesel. Waste in landfill breaks down to form methane gas which is 21 times more potent greenhouse gas than carbon dioxide, therefore reducing biodegradable waste is essential in capping and reducing carbon emissions.

AMEC values alliances with academia, recently becoming an invited new industrial partner in the UK SUPERGEN Biomass and Bioenergy consortium, headed by Aston University, UK. Working closely with academia helps AMEC to bring breakthroughs in science to the market place making innovative solutions a commercial reality. These partnership are key to sustaining the drive to commercial reality as well as helping governments to understand the incentives needed to make projects viable.

Wind technology

AMEC has a wind farm development business with the in-house capability to take both onshore and offshore projects from the initial feasibility stage through to construction and operation and maintenance.



AMEC has developed and constructed wind installations in the UK for over a decade and has expertise in project conception, engineering, management, operation and maintenance and decommissioning.

AMEC is a leading supplier in support of developers, investors and owners of wind farms in Canada and the United States. The business has served the wind energy industry for over fifteen years and has participated in more than thirty completed wind farms, both on land and offshore, with services ranging from site assessment to design and installation to operational support.

With the onshore and offshore portfolios each consisting of more than 1,000MW, AMEC is playing a major role in developing future renewable energy generation. AMEC maintains a balanced portfolio of sites, which includes continual research and

development into new site development opportunities.

Nuclear technology

With the demand for energy increasing and greater pressure on governments to lower their CO₂ emissions, nuclear power generated electricity is becoming strategically important. Existing nuclear power plant operators are facing ever-increasing challenges to ensure their plants - many of which are decades old - operate safely and as efficiently as possible.

AMEC is the leading UK provider of nuclear services and the company's experience spans several decades in the UK and Americas, and more recently in South Africa, Eastern Europe and the former Soviet Union. AMEC is the only UK company to offer a complete range of services that ensure the safe and efficient operation of a nuclear plant, from conception through to decommissioning.

AMEC's knowledge, skills and experience in providing independent nuclear expertise and support to nuclear power-plant operators in many different countries, spans several decades. The company has played a significant role as principal designer and constructor of the first and second generation UK civil nuclear power plants and today provide essential safety consultancy and operational engineering support to nuclear power plants both in the UK, Canada and internationally.

Carbon capture and transport

AMEC is at the forefront of this emerging technology, with existing experience in gas capture, storage, compression and pipeline transmission AMEC continues to use existing skills to provide tomorrow's technological solutions.

Government and industry is showing an increasing interest in carbon capture and storage as it becomes increasingly clear that carbon emission will continue to rise as China and India continue to develop and the demand for energy rises. Carbon capture and storage (CCS) seeks to capture carbon emission at the source of production, CO₂ gas is then transported to underground repositories.

AMEC has significant expertise and skill base in dealing with gas compression and transmission. The business has provided services to the natural gas infrastructure for many years. AMEC is applying this long history of design and environmental experience to tackle the challenge of bringing CCS technology to the market place.

Work is gathering pace and AMEC has already worked on a number of feasibility studies for CO₂ transmission networks and storage. AMEC are currently working with Progressive Energy to design their carbon dioxide pipeline on Teesside, a vital part of their planned clean coal power station with carbon capture. In another project AMEC are conducting a study on carbon transmission solutions in the Humber region of Yorkshire which could potentially see the sequestration of over 60 million tonnes per annum, over

10% of the total emissions for the UK.

AMEC continues to work with the Carbon Capture and Storage Association and contributes to work with government and industrial bodies to make CCS a viable reality.

Environmental services

As the climate changes there are a host of new challenges that business must face and AMEC's Earth and Environmental consultancy has developed a number of enhanced services to assist clients in managing the changing environment.

AMEC has been working with the European Space Agency to develop satellite remote sensing capability as a tool for use in monitoring water quality and for potential use in advanced floodplain management applications. AMEC is also looking at satellite technology for use in calculating biomass from a carbon sequestration perspective.

In addition AMEC have developed carbon management tools and techniques such as LEED building energy audits, energy efficiency programmes and carbon management programmes which conform to the Green House Gas (GHG) protocol. AMEC is developing the tools to help clients to affect a low carbon future.