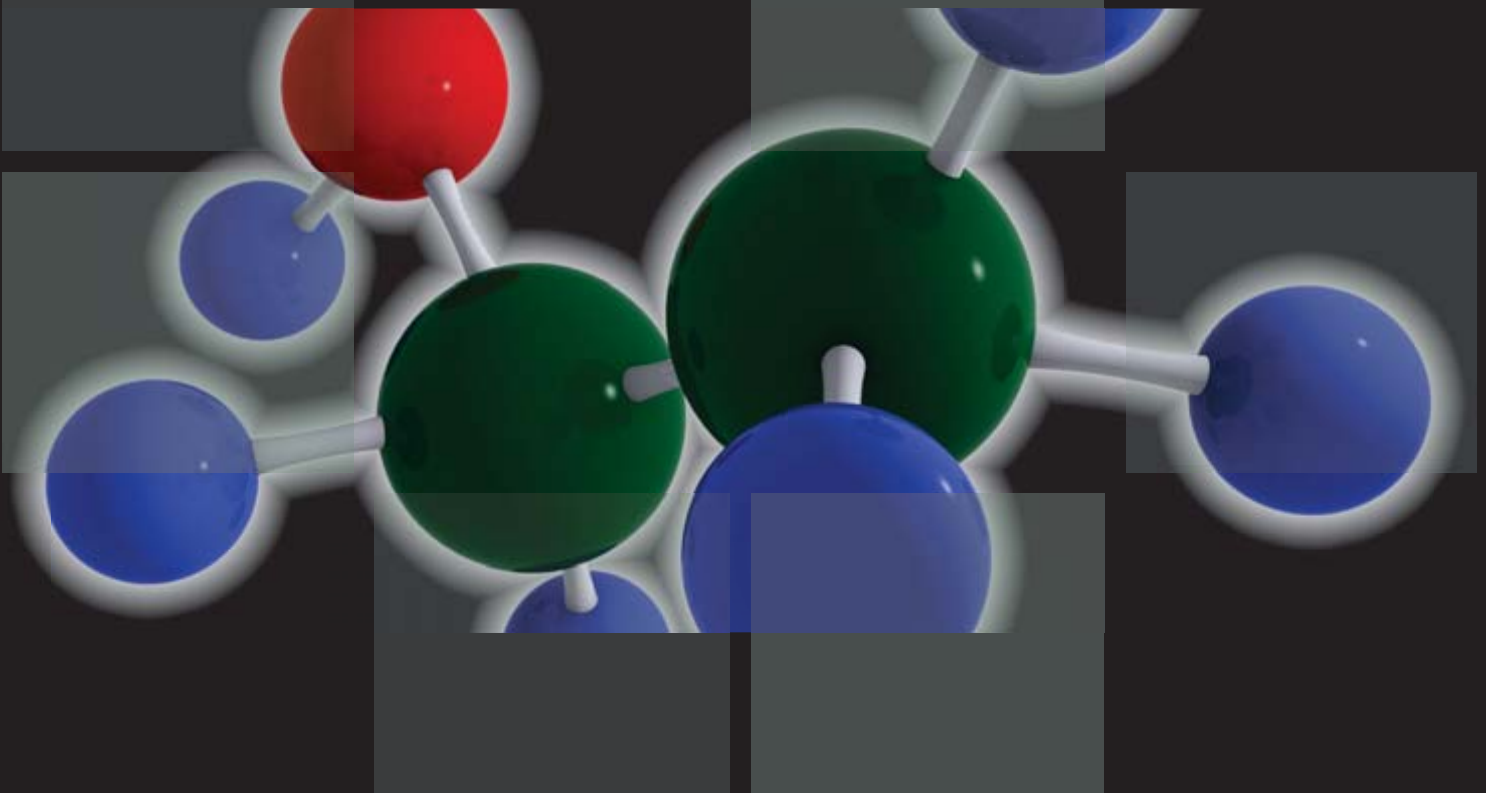


## Shaping the Future: Biofuels



Fusing skills, experience and  
new technologies to deliver  
solutions that work



## World skills on your doorstep

Wherever our clients want to design and build an alternative fuels facility, AMEC is there. AMEC designs, delivers and supports client assets for customers across public and private sectors. In its core businesses, AMEC employs more than 16,000 people working from a network of offices throughout the UK, US and Canada, as well as regional offices and projects worldwide. AMEC shares are traded on the London Stock Exchange where the company is listed in the Support Services Sector (LSE: AMEC:L).

AMEC is the leading global engineering and project management firm doing pioneering work in renewable fuels production. At AMEC, we work with conventional ethanol, biodiesel, biomass gasification and cellulosic ethanol producers to help them achieve their business goals and build sustainable and profitable enterprises.

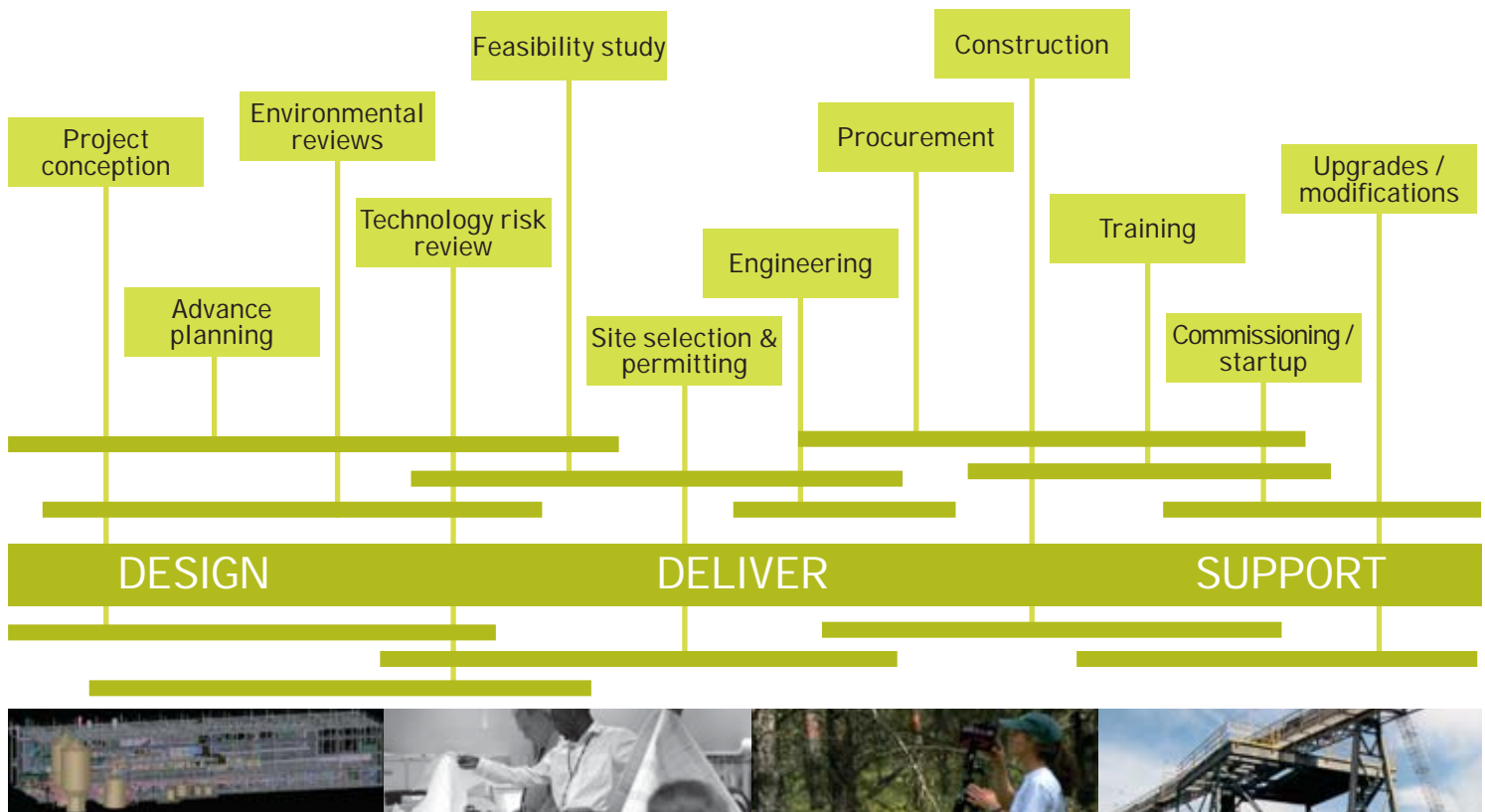
With 7,500 employees strategically located throughout the US and Canada, AMEC has the resources and people to manage any biofuels project in North America.



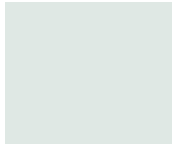
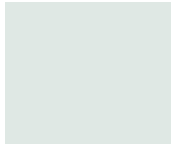
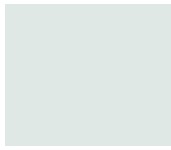
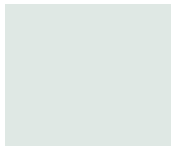
# Making theory a reality

AMEC provides a full range of environmental, engineering, procurement and construction services to the ethanol, biodiesel and biomass industry. The need to improve energy security and reduce greenhouse gases makes bio-processing, now more than ever, a viable solution for producing alternative fuels and other chemical products. Over the next 50 years, the alternative fuels market will achieve remarkable growth in the areas of technology, efficiency and production.

AMEC specializes in integrating new technologies with proven balance of plant systems. Our solutions fuse the unique technology, engineering, environmental and economic requirements of biofuels processes into facilities capable of long-term sustainable and expandable production. If our clients envision using new lower-cost technology or an innovative expansion that will optimize plant performance – we are able to develop their ideas from theory to project conception to reality.



This life-of-asset value chain shows the skills we bring - from project conception to upgrades and modifications - and the services through which these are delivered during the life cycle of your project.



## Experienced delivery

We are experts at the processes of transporting, handling and preparing the raw material building blocks of your product for further processing. The technology for biofuels and bio-energy production may be new and unique, but the raw materials used in the biofuels industry – sugar, corn, wood, grains, biomass – are the same as those used in the pulp and paper, food processing, and chemical industries. AMEC is an established leader in providing services to these industries. Our engineers have decades of experience designing and integrating technology into processing systems, including product separation and purification operations, product storage and loading systems, and balance of plant infrastructure for chemicals, fuels, and co-products. Our unparalleled experience encompasses virtually every component of the facility:

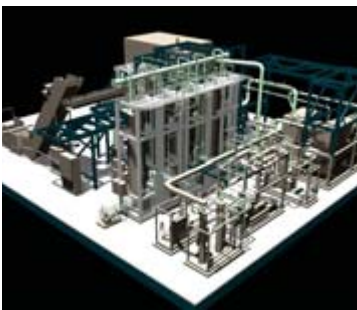


- Environmental permitting
- Bulk materials handling, cleaning and preparation systems
- Grain processing, milling and oil extraction and purification
- Integration of new technology with full plant design
- Design and erection of energy systems that use by-products to produce energy for plant operations
- Chemical process storage, transmission and distribution of liquid fuels
- Employee training and development
- Operational support and maintenance



## Integrating new technology

AMEC's experience with developmental technologies is invaluable to the emerging stage that the biofuels industry is facing today. Examples include world-scale gas to liquids (GTL) projects in the Middle East, coal to liquids (CTL) projects in China and heavy oil upgrading technology targeted at the US, Canada, South America and the Middle East. AMEC has provided engineering services on first and second generation ethanol and biodiesel facilities in the US, Canada and the UK. We have also provided consulting and engineering services on novel corn fractionation, polyols and fine chemicals projects in North America.





## Delivering solutions that work

### Verenium Corporation, Cellulosic Ethanol Demonstration Plant

Verenium Corporation is a leader in the effort to commercialize the production of cellulosic ethanol that is produced from abundant, low-cost cellulosic biomass. Verenium chose AMEC to provide a wide range of professional services at its 1.4 million-gallon-per-year demonstration and associated pilot plants in Jennings, Louisiana. The Jennings plants will allow Verenium to demonstrate the commercial viability of their patented technology on a variety of feedstocks, including bagasse (sugar cane waste), energy cane, and wood. AMEC prepared the air permit application, conducted critical issues review and negotiated the terms of the air permit.

Because of our expertise in processing cellulosic materials and reputation for achieving consistent project results in the chemical process industry, AMEC was selected to assist with site development, feasibility studies, process engineering, procurement, construction management, and commissioning and start-up.

AMEC also assisted with the development of standard operating procedures, training manuals and operator training. We know that, once complete, the finest facility in the world is only as efficient as its workforce. AMEC's training provides safety-driven production techniques to foster the highest performance possible from both facility staff and systems.





## Confidential client

AMEC was selected to provide a wide range of professional services in support of the approval, development, engineering, construction management and operation of a groundbreaking biodiesel fuel production plant. This first-of-its-kind, commercial-scale biodiesel demonstration production facility (60 million liters per annum) was designed using proprietary state-of-the-art technology which converts vegetable oils, agricultural seed oils, waste animal fats, greases and recycled cooking oils into biodiesel.

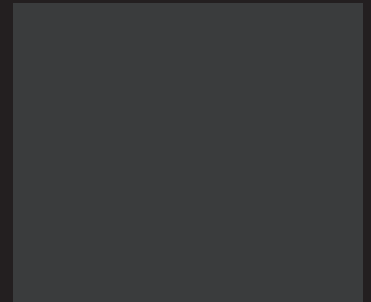
AMEC provided environmental and geotechnical services, site development, feasibility studies, basic and detailed engineering services, procurement assistance and construction support services, as well as standard operating procedure manuals and employee training. The design was developed in PDMS, a three-dimensional CAD program, and the plant was constructed using modular fabrication techniques.

This flagship facility is the model for future plants.



# Comprehensive services

AMEC provides life-of-asset services to our clients, from planning, initial design, permitting and licensing through to project delivery and long-term asset support. Our ability to deliver a complete service solution enables us to add value at every stage of a project. Because of our world leadership in cellulose (pulp and paper) and deep experience in the chemicals, food and beverage, and pharmaceutical industries, we provide unique insights to issues that are critical to the production of biofuels, chemicals and energy from renewable feedstocks and residual waste materials. AMEC applies skills perfected in the 20th century into delivery of state-of-the-art 21st century facilities.



For more information please email us at [connect@amec.com](mailto:connect@amec.com).

[www.amec.com](http://www.amec.com)