Chemicals & Petrochemicals
Tomorrow’s solutions for today’s markets
Amec Foster Wheeler
Chemicals

Project highlights

1. UAE  12. Netherlands
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4. Saudi Arabia  15. Canada
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7. China  18. Kuwait
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9. India  20. UK
10. Malaysia
11. Belgium
AS AN EPC CONTRACTOR OR PROJECT MANAGEMENT CONSULTANT, WE HAVE EXECUTED PROJECTS WITH A TOTAL INSTALLED COST FAR EXCEEDING $80 BILLION.

100s of chemical projects executed worldwide

Over 10 years involvement in complexes producing over one million tonnes/year of ethylene

70 years’ experience in the chemicals and petrochemicals industry.

200 We have executed more than 200 major FEEDs in the last 15 years.
Our technical expertise and extensive international experience make us one of the world’s leading chemicals and petrochemicals contractors.
Amec Foster Wheeler has over 70 years’ experience in the chemicals and petrochemicals industry.

We’ve completed thousands of projects: grassroots facilities, expansions and upgrades. Our experience and capabilities encompass plants that produce feedstocks, intermediate products and finished products, including:

► olefins & derivatives
► aromatics & derivatives
► syngas & derivatives
► fertilisers
► speciality & fine chemicals
► inorganics
► biochemicals

Our major operating centres, regional offices, local and strategic partners ensure that we are ideally placed to provide expert help in the key locations for the chemicals industry.

Our teams have in-depth experience in state-of-the-art technologies and can provide a completely objective evaluation of the full range of options.

We can bring expertise to the entire value chain of the oil and gas industry, from the wellhead to LNG and gas-to-liquids, to refining and petrochemicals, and through to fine chemicals and speciality chemicals.

Delivering excellence
From the planning stage to project implementation, we add value.

We offer a complete range of services to meet our clients’ needs:

► Technical consultancy
► Market studies
► Feasibility studies
► Master planning
► Site selection
► Project development
► Concept design
► Technology packages
► Front-end design
► Project management
► Environmental services
► Detailed engineering
► Procurement
► Construction & construction management
► Commissioning & start-up
► Validation
► Plant operations & maintenance
► Training
► Turnarounds
► Site remediation
Insight & innovation
Our experienced consultants deliver technical and economic plans for cost-effective chemicals investment.

Value-added consultancy
We have completed many investment studies and technology evaluations for petrochemical revamps, upgrades, grassroots plants and petrochemical/refinery integration. Our clients include operating companies, government bodies and institutions.

We offer a full planning service from feasibility studies to the provision of an overall 'master' plan.

We have a proven capability for undertaking studies to identify marketing opportunities and provide the optimum processing facilities for our clients. To develop the optimum solution, we combine objective technology selection, linear programming or simulation modeling of petrochemicals configuration options, cost estimates based on real, extensive in-house data and in-depth local knowledge.

These models are particularly useful when used to update scheduling and planning capability for refinery integration.

We invest time and effort in capturing lessons learnt, sharing best practice, and applying proven value improvement practices to deliver value for money to our clients.
Department of Economic Development
Abu Dhabi

Master plan study for the development of the petrochemicals sector for DED, Government of Abu Dhabi, delivered in conjunction with IHS Chemical.

“...It is worth mentioning that after the successful interactive discussion and presentation, H.E. the Chairman commended all the work done and your contribution to our study.”

Ayman Al Makkaway
Executive Director, DED
“We are pleased with Amec Foster Wheeler’s professionalism, responsiveness to our needs and its capability to mobilise highly-qualified resources from its European offices as well as from its Moscow operations.”
Front-end excellence

Amec Foster Wheeler is widely acknowledged as being a leader in the supply of services for delivering technology packages and front-end design packages.

The quality and integrity of our work provides a first class basis for developing estimates, EPC bidding documents and final investment decisions (FID).

Linking our process expertise and our project execution/estimating skills and IT tools, we apply value improvement practices during the early phases of a project, to deliver the greatest benefit.

We have executed more than 200 major FEEDs in the last 15 years.

CJSC Nizhnekamsk
Tatarstan, Russia

FEED for a new complex consisting of a refinery aimed at processing seven million tpa of crude oil, a deep conversion plant, an aromatics-based petrochemical plant, polypropylene facility, a delayed coker, a gasification plant, plus associated power generation facilities.

“We are pleased with Amec Foster Wheeler’s professionalism, responsiveness to our needs and its capability to mobilise highly-qualified resources from its European offices as well as from its Moscow operations.”

Khamza A Bagmanov
General Director,
CJSC Nizhnekamsk Refinery
As an EPC contractor or project management consultant, we have executed projects with a total installed cost far exceeding $80 billion.

EPC expertise

Our network of execution centres provides our clients with local access to our global resources.

Excellence underpins our project management track record and contributes significantly to our high level of repeat business. We have a reputation for providing world-class project management, as an integral part of our EPC project execution, or working with our clients as their project management consultant.

We deliver a high quality product, with engineering experts who design with a focus on safety, cost, constructibility and operability. Our engineers follow the job through to site and take an active role in construction and commissioning.

We have the expertise, negotiating power and flexibility to match the supply of materials and services to our clients’ cost, schedule, quality, local content and export credit needs. We have successfully developed and worked with equipment vendors in China, India and other lower-cost fabrication centers.

With significant modularisation experience, we have the expertise to develop the optimum construction strategy.

World-class HSE

We are proud of our reputation for world-class HSE performance and are one of the few E&C contractors to date to have won the Singapore Ministry of Manpower’s Occupational Health and Safety Excellence Award for outstanding project HSE performance.

Our construction management personnel are highly experienced and culturally-aware professionals who expect the same world-class HSE standards on their construction sites, wherever in the world we work.

Shell Eastern Petrochemical Complex

Singapore

We were the EPCm contractor for the monoethylene glycol facility on Jurong Island, Singapore, part of Shell’s Eastern Petrochemicals Complex, and for the related modifications at Shell’s Pulau Bukom refinery. We also developed the FEED for both of these elements.

The 750,000 tonnes per annum plant is one of the largest MEG plants in the world and is the largest MEG plant using Shell’s OMEGA technology.

“We built a ground-breaking plant, safely, and to a very challenging schedule.”
“We’ve worked hard to establish a reputation for delivering high quality facilities which start up smoothly and perform reliably.”
We deliver projects, from concept to commissioning and beyond.

For any development, we start adding value from day one, helping our customers to evaluate the opportunity, screen options, select the right option, and then realise the revenue as quickly as possible.

We deliver value at the front end, then can bring our global EPC skills and experience to bear, developing the right execution strategy, and then delivering on time, safely, cost effectively, and right first time. Right through the life of your asset we can provide the right support, from turnarounds and brownfield projects through to long-term asset support, performance improvements, through to late life planning and decommissioning.

Consultancy services
► Environmental
► Marine & coastal
► Geotechnical
► Permitting & regulatory
► Community & social affairs
► Water & wastewater
► Transportation

Project delivery
► Feasibility studies, concept & pre-FEED
► Cost and schedule planning & control
► Technology selection & integration
► FEED design
► Engineering & procurement
► Fabrication & construction
► Project management
► Start-up & commissioning
We have more 70 years of experience in the chemicals industry. We’ve completed thousands of projects, from studies and small process unit revamps to large integrated grassroots complexes. Whether it’s a grassroots project, an expansion, or an upgrade, or on-going asset support, our combined experience and capabilities encompass plants that produce feedstocks, intermediate products, and finished products.

Asset management
► Due diligence & site assessments
► Asset integrity & optimisation
► Operational readiness & implementation planning (OIP)
► Operator training, systems and management
► Operations & Maintenance term services
► Brownfield upgrades & expansions
► Shut-downs / turnarounds
► Dutyholding
► Late life management
► Mothballing & decommissioning
► Remediation
Petrochemicals & the refinery interface

We have a strong track record of achievement and demonstrable expertise.

We are proud to be involved in some of the world’s largest refinery/petrochemicals projects:

- ExxonMobil’s Singapore Manufacturing Site
- Shell Eastern Petroleum Complex, Singapore
- Petro Rabigh, Saudi Arabia
- Nizhnekamsk, Tatarstan, for Tatneft
- IOCL, Paradip, India

We add value, from concept to completion. Dealing with the newest technologies, such as high olefins-producing FCCs and gasification, we are a leader in the industry with our ability to optimise investment and then implement projects successfully.

Petro Rabigh Refining/Petrochemical complex (Saudi Aramco/Sumitomo Chemical Co.)
Saudi Arabia

We undertook the feasibility study and then were awarded the overall FEED and project management for this prestigious project, and EPC of the utilities and offsites. This is one of the largest integrated complexes ever to be built at one time.

“We selected Amec Foster Wheeler after a rigorous review process of competitive bids.

Because of their in-depth petrochemical experience and the quality of their past work for Saudi Aramco, particularly in producing high quality feeds, on time, as they did for our Haradh and Qatif projects.”

Isam A Al-Bayat
Vice President, New Business Development
Saudi Arabian Oil Company
Turnarounds

Amec Foster Wheeler has an excellent track record for delivering successful turnarounds. We are able to manage an entire operation or work as part of an integrated team or alliance. Our aim is always to deliver the shortest possible safe turnaround.

Our extensive experience in planning and implementing these difficult operations allows our clients to meet the toughest schedules and budgets while never compromising on safety.

Our ability to react quickly and manage emergent work during the turnaround itself has time and time again enabled challenging schedules to be met.

A responsive service

We have built strong working relationships with many of our customer through ‘term services’ agreements, providing local or on-site flexible and responsive services for a complete range of projects, backed up by the expert resources in our major engineering centres.

SABIC Europe, UK

We have long-standing alliance agreements with SABIC Europe for its olefins and aromatics businesses (formerly Huntsman assets) on Teesside, UK. We provide detailed engineering, procurement and construction management services covering capital projects and also process engineering and asset support.

We well as focusing our efforts on providing a ‘one-stop shop’ for the full range of expertise that SABIC requires, we know that key to a successful and long-lived alliance is continuous improvement.

Maximising existing assets
“SABIC UK continues to enjoy a long and successful partnership with Amec Foster Wheeler. Their shared commitment to SHE and continuous improvement, plus access to strong corporate support, has seen the Alliance develop in scope and volume over the past 10 years.”

Alan Wasson
SABIC UK Engineering Services Director
Olefins & Derivatives
A proven track record
Olefins & derivatives

Petro Rabigh (Saudi Aramco/Sumitomo Chemical Co.)
Saudi Arabia
We have been awarded the overall FEED and project management, and EPC of the utilities and offsites for this prestigious project at Rabigh, one of the largest integrated complexes ever to be built at one time.

Enterprise PDH
USA
EPC win for Enterprise’s new world-scale propane dehydrogenation unit at Mont Belvieu, Texas

Sadara Chemical Company
Saudi Arabia
FEED work for this huge new fully integrated chemicals complex for the Saudi Aramco/Dow JV, plus EPCm for the propylene oxide unit and EPCm for the huge packaging centre, one of the world’s largest petrochemicals packaging and distribution facilities.

Dow Chemical Company
USA
Safe & successful delivery of a new propylene oxide unit at Map Ta Phut (for Dow/Siam Cement JV) and downstream propylene glycol and polyols unit at Rayong (for Dow).

SABIC (YANSAB)
Saudi Arabia
FEED and programme management contractor for new grassroots petrochemicals complex at Yanbu with an annual production capacity of 3.6 million metric tonnes. This is one of the largest petrochemical complexes to be built in the Middle East and includes a 1.3 Mtpa ethylene plant.

S-Oil Corporation
South Korea
FEED for a residue upgrading project at S-OIL Corporation’s world-scale Onsan refinery. The upgrade of the refinery includes multiple downstream upgrading units to enable the refinery to produce more higher-value products and, in particular, maximise production and recovery of polymer grade ethylene and propylene, and produce MTBE & butene-1.

SAHARA Petrochemical/Basell Polyolefins
Saudi Arabia
Project management consultancy for a new 460,000 tpa propane dehydrogenation unit to convert propane to propylene, a 450,000 tpa polypropylene production unit, and all associated utilities and offsite facilities.
Equate Kuwait
Lump-sum turnkey project, completed within an ambitious 24-month schedule, for a plant producing polyester-grade ethylene glycol.

Amec Foster Wheeler designed and constructed a second world-scale ethylene glycol unit at this site.

ExxonMobil Chemicals Singapore
We led the JV working on the FEED for certain downstream units and associated plant infrastructure for the new world-scale steam-cracking complex at ExxonMobil’s Singapore Manufacturing Site. We provided project coordination and services in an integrated team for the EPC phase and were also EPC contractor for a substantial portion of this huge venture.

CSPC China
Part of the BSF consortium, which was PMC for the definition and implementation phases of this $4.3 billion petrochemicals complex. This greenfield project involved an 800,000 tpa ethylene unit, together with other downstream process units (LDPE, LLDPE/HDPE, EO/EG, polypropylene, styrene monomer, butadiene, propylene oxide, polyols and propylene glycol), and associated offsites and infrastructure.

Indian Oil Corporation India
FEED, overall Managing PMC, plus PMC for a number of process units, and for the utilities and offsites facilities for this huge grassroots Paradip complex, planned to produce 700,000 tpa of polypropylene, 1.2 Mtpa of paraxylene, 600,000 tpa of styrene monomer, along with 10.5 Mtpa of refined petroleum products.

Shell Eastern Petrochemical Complex Singapore
We were the EPCm contractor for the monoethylene glycol facility on Jurong Island, Singapore, part of Shell’s Eastern Petrochemicals Complex, and for the related modifications at Shell’s Pulau Bukom refinery. We also developed the FEED for both of these elements.

The 750,000 tonnes per annum plant is one of the largest MEG plants in the world and is the largest MEG plant using Shell’s OMEGA technology.
A proven track record
Aromatics & derivatives

1. **BP**
   Belgium

   Front-end loading and EPC for grassroots paraxylene plant. Award-winning safety record, and plant meets some of the world’s most stringent community noise restrictions.

2. **Singapore Aromatics Company**
   Singapore

   EPC for aromatics complex producing 350,000 tpa of paraxylene, 95,000 tpa of benzene and associated by-products. Design, which was based on modular construction, fabrication, construction and pre-commissioning were completed in 32 months.

3. **Exxon Chemical**
   Rotterdam, Netherlands

   EPC for expansion and modification of aromatics plant, including revamp of existing isomerisation unit and installation of new twin train paraxylene recovery unit. Completed ahead of schedule, setting a new industry benchmark.

4. **Reliance**
   India

   Engineering and procurement services for the new (and world’s largest) Paraxylene facility, part of the multi-billion dollar expansion of Reliance’s Jamnagar Refining and Chemicals Complex.

5. **ATC**
   Thailand

   Project management of EPC and commissioning phases for new aromatics complex and offsite interconnecting pipeline, producing 565,000 tpa of paraxylene, 301,000 tpa of benzene and 60,000 tpa of toluene.

6. **Invista/Oriental Petrochemicals**
   China

   Basic engineering design for new 600,000 tpa PTA plant, procurement services and ITB preparation for EPC contract, and EPC contractor support. We are a preferred contractor for INVISTA’s PTA technology.

7. **Thai Paraxylene Company**
   Thailand

   FEED and PMC for original paraxylene plant, and FEED and PMC for EPC phase of a later revamp, increasing output from 288,000 to 348,000 tpa.

8. **Abu Dhabi Oil Refining (Takreer)**
   UAE

   Detailed feasibility study for production of paraxylene, benzene and gasoline at the Abu Dhabi and Ruwais refineries.
Invista For SK Corporation
South Korea
Basic engineering design and technical services for a 40,000 tpa butanediol plant.

Gulf Farabi
Saudi Arabia
Project management and project specification for 120,000 tpa n-Paraffin plant and 70,000 tpa linear alkyl benzene plant.

Lucite International
Singapore
FEED/EPC for this new 120,000 tpa plant producing methyl methacrylate. This is the first commercial plant using Lucite International’s state-of-the-art Alpha technology.

Sasol Fischer-Tropsch Wax Expansion
South Africa
Basic engineering, followed by EPCm for one of the largest Sasol projects, designed to increase throughput at Sasolburg, and implement environmental improvements.

Chevron Oronite
Singapore & France
FEED and EPCm for expansions at the Singapore lubricant additives manufacturing facility. Chevron Oronite’s largest manufacturing facility in Asia Pacific. FEED and EPCM for the expansion of a detergent production unit at Gonfreville l’Orcher in France.

Degussa
China
EPC for new 3,500 tpa organic peroxide production facility. Jade II, including production building, warehouse, low-temp warehouses, tank farm, substation and pipework.

Sasol/Mitsubishi
South Africa
This acrylic acid and acrylates complex was completed on time, under budget, with an excellent safety record, to a high quality level and beating the world construction norm for these plants by three months.

LANXESS Changzhou Co Ltd
China
EPCm for the world’s largest grassroots ethylene propylene diene monomer (EPDM) rubber plant, planned to produce 160,000 tonnes of EPDM per year.

OSOS Petrochemicals
Saudi Arabia
FEED and project management consultancy services for new petrochemicals complex to produce 60,000 tpa of polybutylene terephthalate, including basic design for utilities and offsites, cost estimate and evaluation of EPC bids.

Chrome International
South Africa
Designed and built a new world-scale facility, producing sodium dichromate and chromic acid. Met stringent containment requirements to capture Chromium IV.

Arkema
Malaysia
Pre-FEED, FEED and EPCm for a world-first integrated bio-methionine and thiochemicals plant.

Fine & speciality chemicals
A proven track record
Polymers

PETRONAS
Malaysia
EPC of centralized utility facilities at Kertih and Gebeng and additional LDPE project with steam generator, co-generation units, demineralized water plant, cooling water, effluent treatment plant, air separation units, auxiliary boilers and metering.

Borouge
UAE
Project management contractor for expansion of existing facility, plus FEED for utilities and offsites. Tripling ethylene production, doubling polyethylene product and adding polypropylene units.

Chemopetrol
Czech Republic
EPC, start-up activities and initial plant operation of 250,000 tpa new polypropylene plant using Ineos’ (BP Amoco heritage) licensed polymerisation technology. Very tight 27-month schedule to start-up achieved with outstanding safety performance.

INEOS Olefins & Polymers Europe
UK
Shut-down, turnaround and start-up services for LLDPE plant.

Shaanxi Yanchang / Yulin Energy & Chemicals
China
PMC services for a combined coal and natural gas to methanol unit (1,800,000 t/y). Includes HDPE, LLDPE and PP units.
Syngas

**Petrobras**

Brazil

FEED for a world-scale grassroots gas-to-chemicals complex planned to produce more than 1 Mtpa of ammonia and urea fertilisers, methanol, acetic acid, formic acid and melamine.

**Air Products PLC**

UK

Basic engineering design and EPCm for an advanced plasma gasification energy-from-waste facility, the first of its kind in the UK and the largest of its kind anywhere in the world.

**INEOS Bio**

USA

INEOS Indian River County BioEnergy Center is a 6MW bio-ethanol power project in Florida. We worked with INEOS Bio to develop engineering design packages for the technology licensees, and engineered and designed the plant by using INEOS’s advanced waste-to-bioenergy technology.
Amec Foster Wheeler (www.amecfw.com) designs, delivers and maintains strategic and complex assets for its customers across the global energy and related sectors.

With pro-forma 2014 scope revenues of £5.5bn and over 40,000 people in more than 55 countries, the company operates across the whole of the oil and gas industry - from production through to refining, processing and distribution of derivative products - and in the mining, clean energy, power generation, pharma, environment and infrastructure markets.

Amec Foster Wheeler shares are publicly traded on the London Stock Exchange and its American Depositary Shares are traded on the New York Stock Exchange. Both trade under the ticker AMFW.

connected excellence in all we do