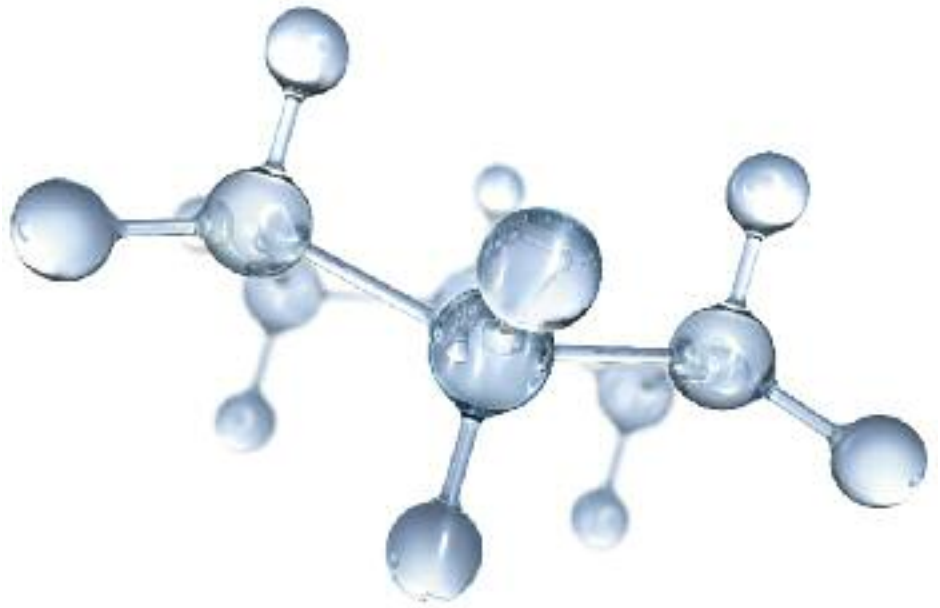


Fawley Refinery and Petrochemical Plant



ExxonMobil

Taking on the world's toughest energy challenges.™



ExxonMobil is part of Exxon Mobil Corporation, which is the world's leading publicly-traded petroleum and natural gas company. Based in Texas, USA, the corporation has more than 80,000 employees in 80 countries and business interests across the globe. It was created by the merger of Exxon and Mobil in 1999.

ExxonMobil is the largest gas producer in Europe. We supply about 10 per cent of Europe's gas demand and about 10 per cent of Europe's oil demand. We are also one of Europe's leading manufacturers of petrochemical products.

The company has its main UK offices at Leatherhead in Surrey, and operations in England, Scotland and Wales. The company provides work for approximately 7,500 employees and some 2,000 contractors in the UK.

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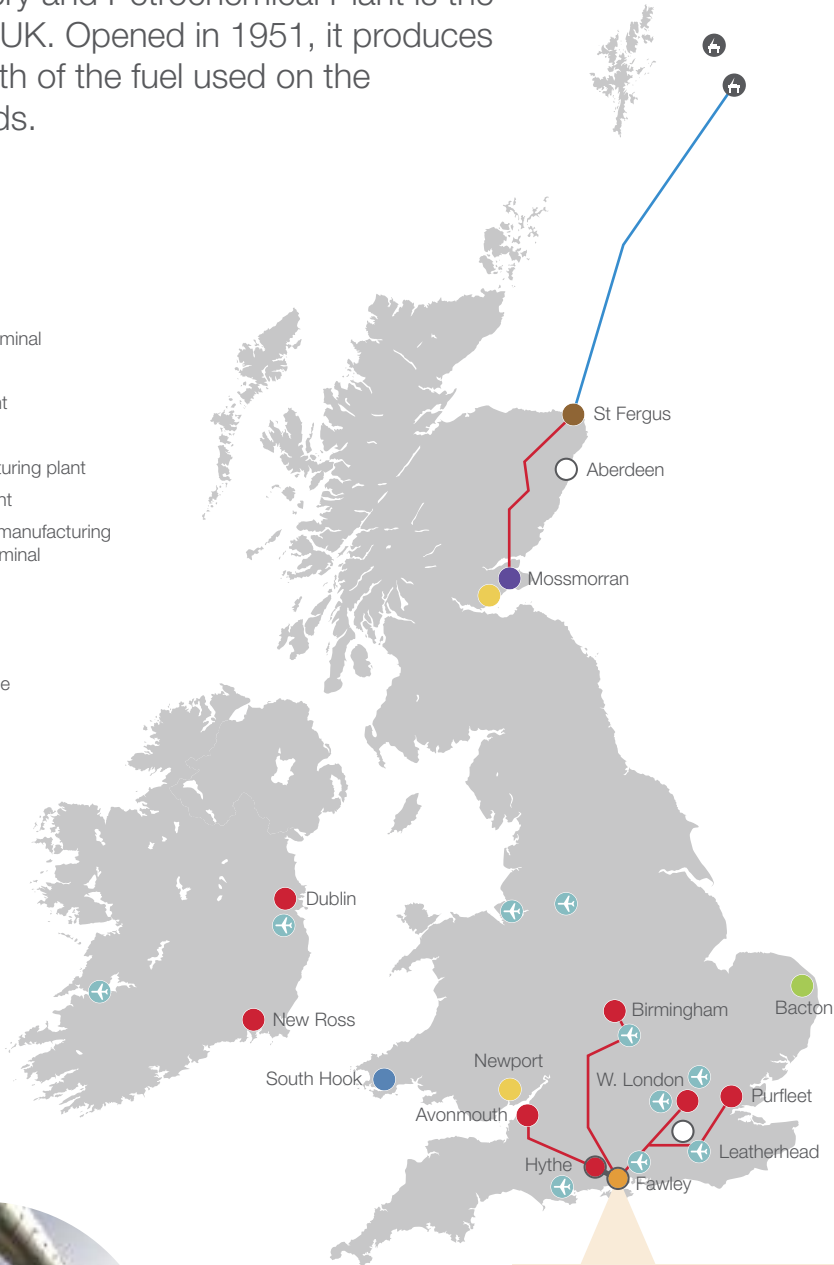
ExxonMobil in the UK and Ireland



Fawley Refinery and Petrochemical Plant is the largest in the UK. Opened in 1951, it produces almost one fifth of the fuel used on the country's roads.

Legend

- Fuels distribution terminal
- Office
- Gas processing plant
- Gas terminal
- Chemicals manufacturing plant
- NGL processing plant
- Refinery, chemicals manufacturing plant and marine terminal
- ✈ Airport operations
- LNG terminal
- Oil and gas fields
- Underground pipeline
- Gas pipeline
- Co-located service



Fawley Refinery and Petrochemical Plant

Location: Fawley, Hampshire
Opened: 1951
Output: Jet fuel, petrol, diesel, lubricating oil, fuel oil, various chemicals
Annual production capacity:

- Up to 330,000 barrels of crude oil processed each day (15 million tonnes per year)
- Over 850,000 tonnes of chemical products produced each year

Number of workers on site: Over 2,300

Welcome to Fawley

Covering 3,250 acres on Southampton Water, Fawley Refinery and Chemical Manufacturing Plant is the largest in the UK, and one of the most complex in Europe.

The first refinery on the site was developed by the Atlantic Gulf and West Indies Petroleum Company (AGWI) in 1921. Ever since then the site has played a key role in the area, providing jobs and helping to sustain the local community.

After buying AGWI, Esso, which is now part of ExxonMobil, opened a new refinery on the site in 1951 and some 60 years later it is still going strong.

Today the refinery processes 330,000 barrels of crude oil every day, providing 20 per cent of the UK's total refining capacity. Over 2,000 ships visit Fawley's modern marine terminal each year, delivering more than 22 million tonnes of crude oil and transporting other products from the site.



Some of the processed oil from the refinery is used as feed for the neighbouring chemical plant, which manufactures over 850,000 tonnes of petrochemical products every year.

You can explore Fawley Refinery online as part of an award-winning virtual tour at <http://resources.schoolscience.co.uk/exxonmobil/index.html>

Oiling the wheels of everyday life

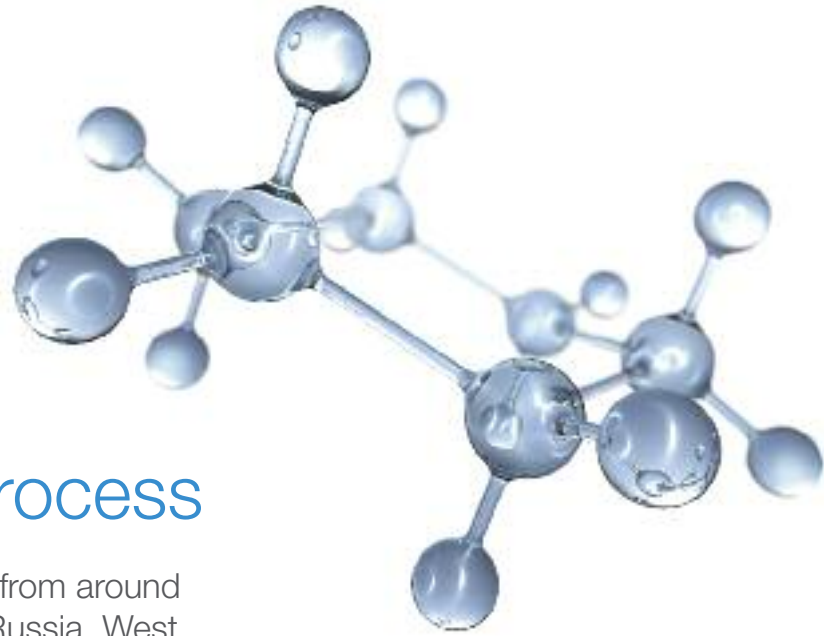
Oil and chemicals play a vital role in every aspect of modern life. If you refuel your vehicle with petrol or diesel in the South of England, there is a strong chance the fuel was manufactured at Fawley. At home, you will be surrounded by products containing materials made from crude oil – from carpets to CDs; from toiletries to trainers; from paint to plastics.

Your vehicle's tyre linings almost certainly contain man-made rubber from Fawley, and if you board a boat, plane or train, it may well be using our fuel.



Did you know ?

At 1.5km long, Fawley's marine terminal is the largest independently owned port of its type in Europe.



The production process

Crude oil comes to Fawley in tankers from around the world – including the North Sea, Russia, West Africa and South America. Fawley typically processes over 20 different types of crude oil each year.

Each tanker takes up to two days to unload its cargo, which is then pumped to some of the site's 330 storage tanks. Each tank holds around 21,000 cubic metres of crude oil, enough to fill eight Olympic swimming pools. The crude oil is treated and converted at the refinery into consumer and industrial products using three main processes: separation, conversion and purification.

Separation

To begin the refining process, the crude oil is separated into its naturally occurring components by applying heat through a process called distillation. Primary separation is performed in a pair of distillation columns, with the bottom product from the first column feeding the next. A furnace in front of the column heats and vaporises the crude oil. The vapour and liquid mixture is then fed into the bottom section of the tower. The feed section is the hottest point in the distillation column and ranges between 320°C to 370 °C.

Components that are still liquid at such high temperatures become the column's bottom product, which is known as atmospheric residue. Components that are in vapour form rise up the tower through a series of distillation stages. The temperature decreases as the vapours rise up the column and the components condense.

Because a liquid's boiling point decreases at lower pressures, the Atmospheric Residue is further heated to over 400°C and distilled in a second column that operates under a vacuum

to maximise liquid recovery. Products from the distillation column range from gases at the top to very heavy, viscous liquids at the bottom.

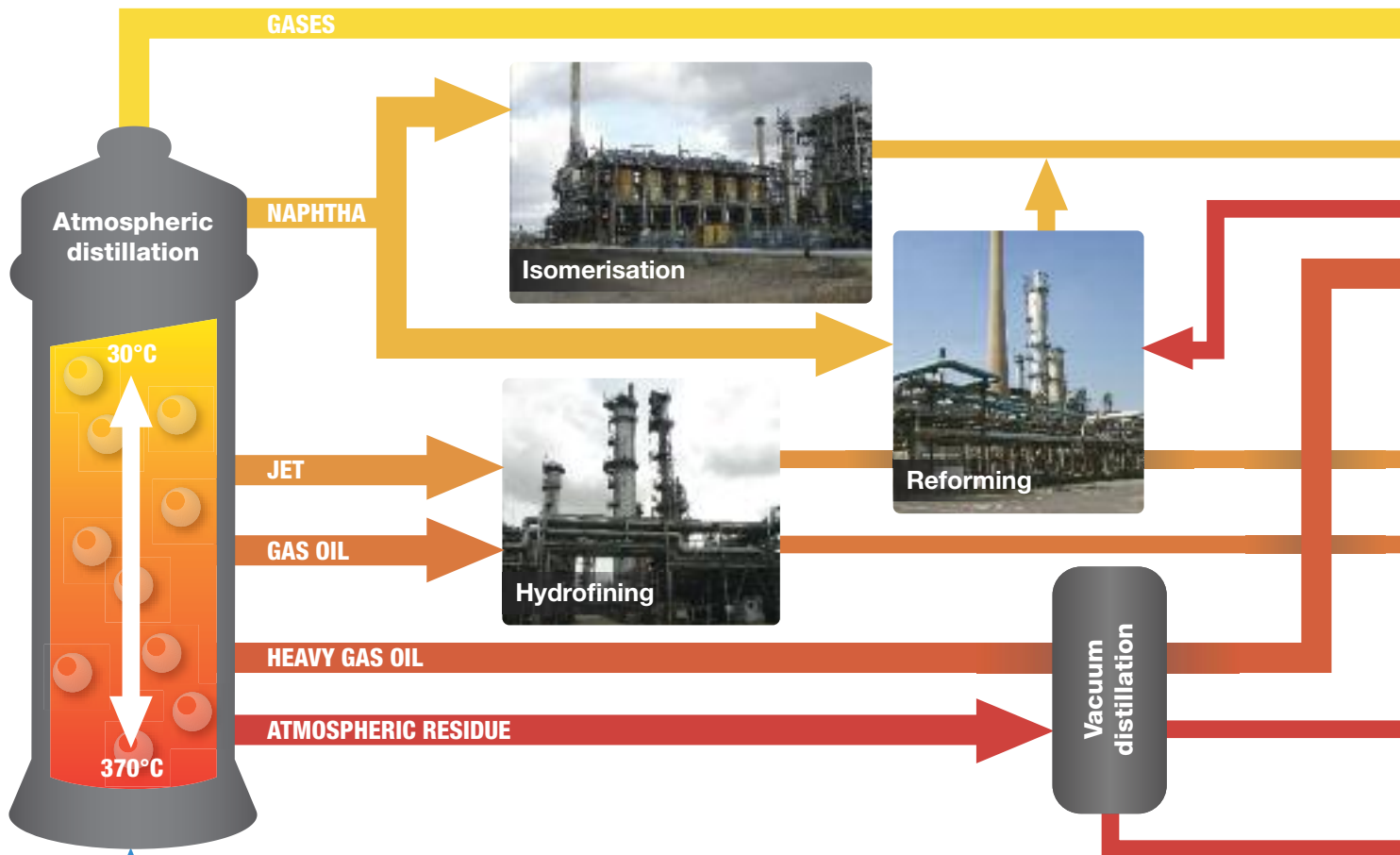
Conversion

Distillation separates the crude oil into unfinished products. However, the products do not naturally exist in crude in the same proportions as the product mix that consumers demand. Essentially, there is too little petrol and too much of the heavier fuel oil naturally occurring in crude oil, so conversion processes are used to convert low-value fuel oil into high-value gasoline and other lighter products.

All products in the refinery are based on the same building blocks: carbon and hydrogen chains, which are called hydrocarbons. The longer the carbon chain, the heavier the product will be. Converting heavier hydrocarbons to lighter hydrocarbons can be compared to cutting a link on a steel chain to make two smaller chains. This is the function of Fawley's Fluidised Catalytic Cracking Unit (FCCU).

In addition to breaking chains, there are times when we want to change the form of the chain or put chains together. This is where the Powerformer and Isomerisation Units are necessary.

The FCCU uses a catalyst (a material that helps make a chemical reaction go faster, occur at a lower temperature, or control which reactions occur) to convert gas-oil into a mix of Liquefied Petroleum Gas (LPG), petrol and diesel.



The heaviest material in the refinery is Vacuum Tower Bottoms (VTB) or residue. It is processed in the Residfiner which removes impurities so that it can be used as additional feedstock for the FCCU.

Reforming is the last conversion process. It increases the octane number of petrol blend components and generates hydrogen for use in the refinery hydrofiners. The same length carbon chains can have very different octane numbers based on the shape of the chain.

Straight chains, or paraffins, have a relatively low octane number, whilst rings, or aromatics, have high octane numbers. At high temperatures and in the presence of hydrogen, the catalyst will “reform” paraffins into aromatics, hence the name catalytic reforming. Some of the aromatics produced are used at Fawley in the production of petrochemicals, such as plastics and fabrics.

Purification

Once crude oil has been through separation and conversion, the resulting products are

ready for purification - principally sulphur removal to meet product quality specifications and environmental standards. This is done by Hydrofining, in which the unfinished products are fed into a heated, high pressure chamber containing hydrogen and a catalyst.

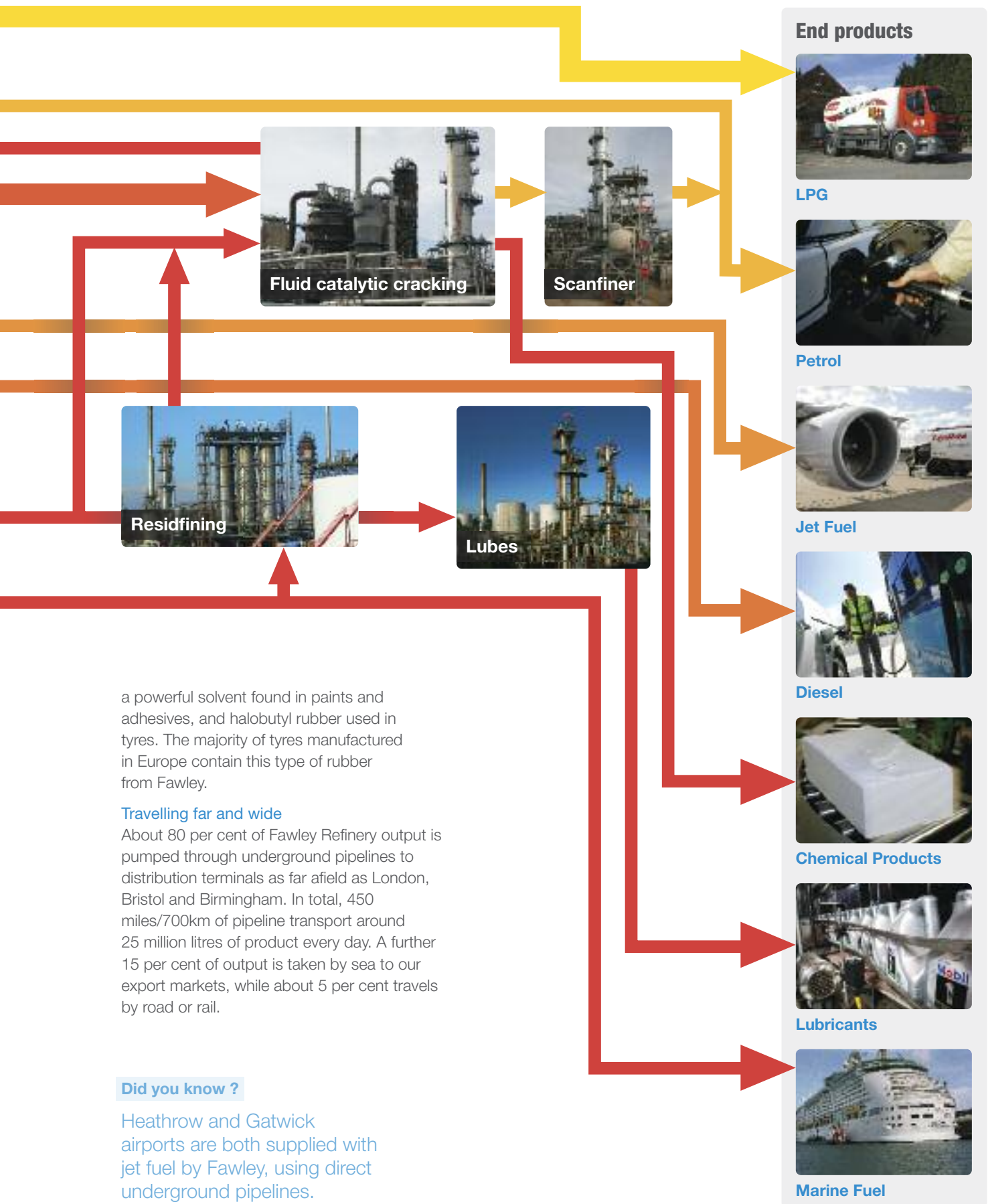
A further process, sulphur recovery, converts hydrogen sulphide to water and sulphur, which is sold as a refinery byproduct.

Chemical processes

Some of the products that come out of the refinery are transferred to the site’s major petrochemical plant. We also import butene to the plant, which is stored in seven large pressurised spheres, known as the Seven Sisters.

The raw materials pass through a series of complex processes to create a range of chemicals that have a wide variety of applications in the manufacturing industry.

The main products manufactured at the plant are methyl ethyl ketone (MEK),



a powerful solvent found in paints and adhesives, and halobutyl rubber used in tyres. The majority of tyres manufactured in Europe contain this type of rubber from Fawley.

Travelling far and wide

About 80 per cent of Fawley Refinery output is pumped through underground pipelines to distribution terminals as far afield as London, Bristol and Birmingham. In total, 450 miles/700km of pipeline transport around 25 million litres of product every day. A further 15 per cent of output is taken by sea to our export markets, while about 5 per cent travels by road or rail.

Did you know ?

Heathrow and Gatwick airports are both supplied with jet fuel by Fawley, using direct underground pipelines.

Safety, health and the environment

ExxonMobil is committed to ensuring the health and safety of everyone working at Fawley, or living in the surrounding area. This commitment extends to the protection of the local environment for the good of residents and workers alike.

Health and safety

We are extremely proud of our health and safety record at Fawley. Our goal here, and at all our other sites, is to have a workplace where nobody gets hurt.

Our award-winning commitment to safety has been recognised many times, both within the industry, and by independent safety experts.

We continue to explore new and better ways to improve the safety and integrity of our operations.

The environment

The thriving saltmarsh that borders the site at Fawley is a Site of Special Scientific Interest (SSSI) that is home to over 20 species of birds. The rest of the site is surrounded by a thick screen of some 50,000 established trees and shrubs, which provide a natural woodland habitat.

Water plays an important role in the production process at Fawley. Each day, the plant draws up to 1.8 million tonnes of



seawater from Southampton Water, mostly for cooling. When this is returned to the sea after purification, it's often cleaner than when it was extracted.

To help reduce energy consumption at Fawley, the plant uses a combined heat and power generator (Cogen) that burns at twice the efficiency of a conventional power station, cutting energy costs and reducing carbon emissions. The Cogen unit, which is owned and operated by Esso, is used to produce up to 230 tonnes of steam per hour for use in the refinery, as well as electricity. Any electricity that is not consumed on site is fed into the National Grid, so Fawley is a net exporter of electrical power.

Two other initiatives are helping to minimise the site's environmental impact. A recycling programme has helped to reduce the level of general waste at the refinery by increasing recycling to more than 80 per cent. The aim is to increase this still further until no general waste from the site needs to be sent to landfill.

Meanwhile, the refinery operates a series of biopiles, which use organic substances that are naturally present in soil to break down waste from the refinery so that any potential contaminants are removed. This approach, which resembles a high technology compost heap, minimises the amount of hazardous waste produced on site that needs to be sent away for incineration.

Did you know ?

Fawley pioneered the introduction of lead-free petrol in the UK.



Did you know ?

The Fawley Refinery was opened by Prime Minister Clement Attlee on 14 September, 1951.



Fawley and the community

We have been part of the Waterside community for some 60 years. We firmly believe in being responsible neighbours and support our local area through a well-established programme of grants and assistance to local charities, schools and community groups.

ExxonMobil encourages employees and their families to contribute their time, talent and energy to schools, charities and non-profit organisations. The company's Volunteer Involvement Programme (VIP) and Governor Scheme does this by recognising the voluntary efforts of employees and their families, and rewarding the organisations they support with grants of up to £1,000 per year. Since the programme began in 2002, the Fawley representatives have given tens of thousands of hours of their time to charities and local community groups, which have received grants under the scheme totalling over half a million pounds.

Many employees at Fawley also take part in an annual Day of Caring, in which they give up a working day to participate in local

community projects, such as clearing the ancient pond at Holbury Manor Park, removing undergrowth at the New Forest Front Nature Reserve and laying a new path at Lepe Country Park.

ExxonMobil also makes donations direct to charities and community groups neighbouring the Fawley site. The company covered the £13,000 cost of the new, hand-crafted oak fence and gate at All Saints Church, Fawley, for example. Other examples of local donations, include sponsorship of community events, such as Hamble Week; helping to fund the role of the Coastal Ranger at Lepe Country Park; and the purchase of digital cameras for the New Forest Agisters, to highlight the dangers of failing to slow down for animals.

ExxonMobil also operates a Link Schools programme with 10 schools in the Fawley neighbourhood. Besides giving cash grants to local schools, this initiative helps local teachers to show how the school curriculum is relevant to working life, while students gain an appreciation of the importance of industry to their local economy and the skills needed for the world of work. ExxonMobil works alongside Learning through Landscapes - a national school grounds charity that believes that outdoor learning is an essential part of a child's development - and CREATE - a charity that encourages more sustainable uses of energy while reducing carbon emissions.

For more than 12 years the site has also sponsored the Esso Maths challenge, an annual contest for Year 10 pupils in local schools. The Challenge involves teams of students working together to solve a series of very challenging mathematical problems.

The Fawley site also supports Local Authority initiatives, such as New Forest District

Council's Brilliance in Business Awards, in which ExxonMobil has sponsored the Innovation and Entrepreneurship category for several years. The site also supports Hampshire County Council's Hantsweb Awards, sponsoring the category for the best website operated by secondary schools or colleges in the county.

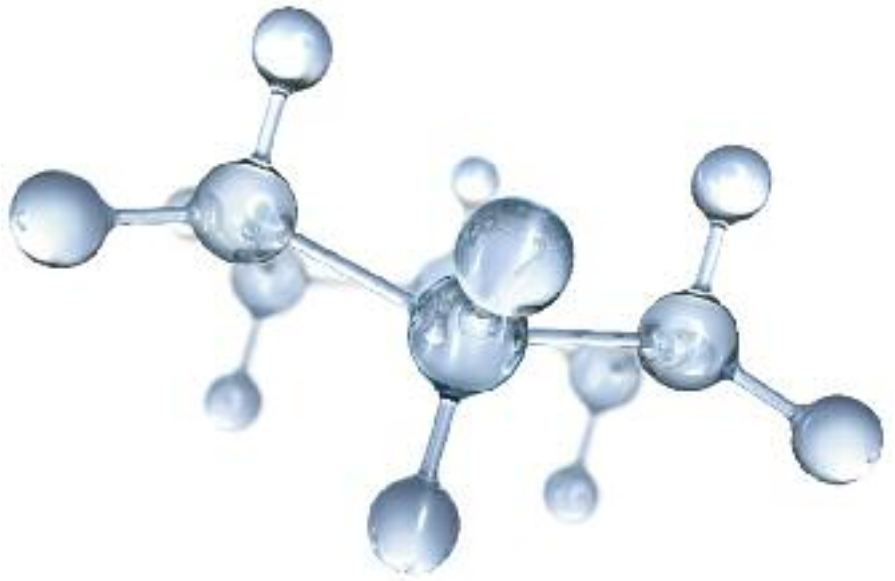
Local residents are welcome to visit Fawley on guided tours of the site. Each visit starts with an introductory talk, followed by a coach tour of the site.

Our Community Matters newsletter about the Fawley site is distributed to local residents six times a year. This gives updates on operations at the plant and reports on any local projects involving the plant and the people who work there.



Did you know ?

We sponsor the Fawley online website at www.fawleyonline.org.uk, which provides the latest news about what's going on in the area and electronic copies of our newsletter Community Matters.



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Taking on the world's toughest energy challenges.™



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