Industry insight – Energy and utilities

In a nutshell

The UK’s energy and utilities industry is vast and diverse, comprising:

- oil, petroleum and gas;
- nuclear power and coal;
- water and waste management;
- renewable energy industries;
- energy conservation organisations.

The industry employs around 530,000 people in total, almost 2% of the UK workforce.

Energy and utilities play an indispensable role in the global economy, with fossil fuels considered among the world’s most important resources. However, the industry has been affected by the recent economic crisis, as well as the increasing regulations relating to climate change. The industry will play a key role in future global development with the growth of alternative energies providing job opportunities. According to Energy & Utility Skills, the UK power sector alone will need to recruit 35,000 new employees by 2024.

What kind of work can I do?

The energy and utilities industry employs people across the oil, electricity, nuclear, gas, coal, water, waste management and renewable energy sectors. Areas of work within the industry include:

- design, research, testing, commissioning and installation of energy equipment;
- drilling and exploration;
- advising on energy and conservation;
- ecology and geology;
- developing and testing new technologies and alternative sources of energy;
- sales, marketing, HR, health and safety, accountancy and IT.

The following profiles are examples of key jobs that exist in the energy and utilities industry:

- Drilling engineer
- Energy manager
- Engineering geologist
- Environmental consultant
- Geophysicist/field seismologist
- Geoscientist
- Hydrogeologist
• **Mining engineer**
• **Mudlogger**
• **Petroleum engineer**
• **Recycling officer**
• **Waste management officer**
• **Water quality scientist**
• **Wellsite geologist**

**What’s it like working in this industry?**

- Generally the energy and utilities industry has a culture of being relatively recession-resistant. However, it is affected by increases in fossil fuel prices and government interventions on tackling climate change and emissions.
- Working conditions vary greatly across the industry. Some roles, such as design or research, have typical working hours, e.g. nine to five, Monday to Friday. Engineering or technical specialists may work more unsocial hours.
- The work can be office-, laboratory- or site-based, with site visits and field work being conducted outside in all weathers. Some jobs may be offshore in remote and isolated locations.
- Salaries vary considerably across the industry and according to the location, sector and size of the employing organisation. Salaries are normally higher offshore and in energy engineering.
- Women make up just 24% of the energy and utilities workforce, with the density of female workers particularly low in the electricity and waste management sectors. Only 4-7% of the workforce is from a BAME (black and minority ethnic) background, which is lower than the national average (Energy & Utility Skills).
- In water and associated fields, 166,500 people collect, treat and supply more than 16 billion litres of water each day (Water UK). The UK waste management industry employs around 142,550 people, dealing with approximately 290 million tonnes of waste generated each year from households, industry and commerce (Energy & Utility Skills and Department for Environment, Food and Rural Affairs (DEFRA)).
- Over 142,000 people work in the gas industry, 87,000 in power generation and distribution and 6,000 in the coal industry (Department of Energy and Climate Change).
- More than 150,000 people are directly employed in the petroleum industry, as well as several thousand contact workers. The nuclear industry employs 44,000 people (Cogent: The Sector Skills Council for Chemicals, Pharmaceuticals, Nuclear, Oil and Gas, Petroleum and Polymers).
- UK oil comes mainly from the North Sea and off the coasts of Aberdeen, Suffolk, Norfolk, Liverpool and Morecambe Bay.
- UK specialists in deepwater and subsea technology are in demand all over the world. Oil exploration takes place in many remote areas of the globe. See **opportunities abroad** for more information.
- Jobs in utilities tend to be primarily based in the UK, within many regional offices.
Some roles involve a lot of travel, e.g. nuclear research scientists collaborate with other scientists all over the world.

Entry and progression

How do I find a job?

Jobs are advertised in a variety of places, including:

- specialist energy, engineering or planning recruitment agencies, such as Matchtech, Gradcracker and Hamilton Consultants;
- recruitment fairs and networking events;
- university careers services;
- websites of large organisations, professional bodies and public sector organisations;
- local and national press.

The larger graduate recruiters tend to use online applications although requests for a CV and a covering letter are still used across the industry. Speculative applications for lower-level positions are fairly common, although most posts will be advertised, certainly at a senior or professional level.

Graduate, apprentice and management training schemes are common. Intakes for graduate schemes are typically in the autumn and spring terms, although many national and international organisations recruit for positions all year round. Oil companies have been known to recruit internationally, so UK graduates can be in competition with those from the USA and Europe.

Fixed-term contract work, short-term placements, and temporary work through agencies are all useful entry points, especially in a depressed economic market where employers may be reluctant to take on permanent staff.

What skills do I need?

Employers will expect a sound technical background in a relevant degree, typically with a minimum grade of 2:2. Due to competition for certain jobs, some larger employers may ask for a minimum of a 2:1 degree.

High levels of mathematical, scientific and technological skills may also be expected.

In parts of the industry, it’s possible to enter the profession at a lower level and work your way up to senior positions using a combination of experience and qualifications along the way.

In addition to academic requirements, graduate recruiters may look for the following skills:
- excellent communication skills, written and oral;
- good IT skills;
- good analytical and problem-solving skills;
- excellent organisational and planning skills;
- flexibility and adaptability;
- initiative;
- leadership, motivation and enthusiasm;
- commercial awareness;
- teamwork;
- good technical skills.

Many academic courses are structured to incorporate these skills but other ways to gain them could include work experience and getting involved in student clubs and societies, or event organisation.

**Where can I find work experience?**

Employers will value work experience across all levels and job roles. Many graduates gain experience through a placement on a sandwich degree course. If your university does not offer this then you should apply for work experience opportunities yourself. This will demonstrate to potential employers your initiative, commitment and enthusiasm.

Temporary and voluntary positions are also useful, although these types of work opportunities are rarely advertised so speculative letters, applications and networking are encouraged.

Many of the larger fuel and energy organisations now offer work experience opportunities through summer courses, one-year industry schemes and summer internships. For example, BP and Shell both offer internships which last from 8 weeks to a year.

There are also specialist agencies such as the Year Out Group and The Year in Industry that have details of gap year organisations and companies.

**Is postgraduate study useful?**

While postgraduate study is not usually necessary to enter the industry, in a competitive jobs market it is certainly useful for technical roles. As the alternative energy sector expands, postgraduate courses, such as an MSc in Renewable Energy Technology, are now becoming more commonly available.

The industry generally supports further study while working and any good employer will provide the opportunity to work towards gaining professional status, awarded by an institution. Acquiring professional status usually takes around two years of working and studying, and requires the achievement of specific competencies within the area of work. The process typically involves keeping a log of experiences and a final interview and/or presentation.
How can my career develop?

Most companies offer on-the-job training. Technical roles such as engineers are likely to pursue chartered status. Gaining chartered membership of the appropriate institution and undertaking agreed levels of continuing professional development (CPD) are a key part of career development which will enable progression to more senior posts.

Most employers will fully support graduates during this process through mentoring, training courses, graduate networking events and even tailored career pathways. Promotion may be dependent on gaining professional qualifications and the appropriate practical experience. Generally there will be opportunities to advance through the company structure or to move to a larger organisation in order to gain promotion.

There also may be opportunities in research and development (R&D) roles or working as a consultant, which can provide more scope for the development of personal interests. There are also many opportunities for employment overseas.

Typical employers

Opportunities in energy and utilities include geotechnical, engineering, scientific, environmental and waste management roles, although almost every area of industry uses a large amount of energy in its production processes, so there are many industries that employ energy specialists.

There are many different opportunities in the fuel production industries including oil, gas and nuclear. This can include exploration, drilling, construction, diving supplies, transportation, petrol retailers or refineries.

Research is also a growth area, with an increasing need to research, develop and test alternative sources of energy, such as wind, solar, tidal and geothermal power.

Local governments, public bodies and charities are concerned with promoting energy conservation and can offer opportunities to graduates who want to work in this area.

Big players

- Many top global companies are involved in the exploration and production of oil and gas. Major recruiters include Hess, BP, Centrica, Chevron, ConocoPhillips, ExxonMobil, Shell, Schlumberger and Total.
- Over 18 energy companies supply the UK, but the market is dominated by the so-called ‘big six’: British Gas, EDF Energy, E.ON, Npower, Scottish Power and SSE.
- The renewable energy market has been growing at record rates, with the UK wind industry leading the way. There are a number of global companies such as Vestas, Gamesa, RES, GE Energy, Siemens and Suzlon.
- There are over 30 water companies in the UK, including Veolia Water, Scottish
Water, Yorkshire Water, United Utilities and regional water suppliers.

- The waste management and recycling market also offers many opportunities. Companies include Biffa, Waste Recycling Group, Shanks Waste Management, Veolia Environmental Services and Viridor.

**Small to medium-sized enterprises (SMEs)**

Although the gas (transmission and distribution), power and water sectors are dominated by global companies and a few big names, the majority of gas (utilisation) and waste management companies are SMEs and sole traders.

The National Skills Academy for Nuclear has received almost £1 million in government funding to deliver skills training systems for manufacturing within the nuclear sector, which will be particularly focussed on SMEs.

Careers services should have listings of jobs with small firms. Vacancies are also advertised in local newspapers and through relevant professional bodies. Also see the Department for Business, Innovation and Skills (BIS).

**Self-employment**

Self-employment and freelance work are possible but not very common in this industry. However, there are some freelance consultants that offer expertise in highly specific areas within the oil and gas, waste management, recycling and renewable energies sectors. Self-employment is not usually possible until you have several years’ experience and are professionally qualified.

**Opportunities abroad**

Energy and utilities is a global industry with opportunities in various professional and technical disciplines available across the world, particularly in the oil and gas sector. Many of the energy and utilities firms working in the UK will also have sites and offices across the world.

The most likely opportunities for working abroad can come from working for large multinational companies, where there may be opportunities to work on an overseas project or be based abroad. If this is your long-term goal, the ability to speak a second language may be useful.

The following countries rank among the world’s largest producers and exporters of oil and natural gas, and offer a range of opportunities:

- Russia;
- Saudi Arabia;
- USA;
• Iran;
• Canada;
• China;
• Mexico;
• Qatar;
• Norway;
• United Arab Emirates.

New oil fields have been discovered in Turkmenistan, Vietnam, Azerbaijan and Kazakhstan.

There are offshore opportunities throughout the world in places such as Asia, Australia, the Gulf of Mexico and West Africa.

The USA, China, Germany, Denmark and Spain are all major wind turbine producers. The USA and Spain are also leading the field in the construction of huge solar farms with projects running to 2014 and beyond.

France uses nuclear power as its primary source of electricity. Several countries remain active in developing nuclear power, including China, South Korea and India. All are actively constructing new plants and developing thermal technology, offering further opportunities for international employment.

**Will my qualifications be recognised?**

While there are no specific Europe-wide qualifications, UK qualifications and membership of the leading institutions are widely accepted and respected by organisations throughout the world.

While overseas companies tend to favour experienced graduates, many multinational organisations will readily take on more recently qualified graduates. For skilled, technical or managerial positions, educational background is something that potential employers will consider, with a degree in a related subject improving your chances of landing a higher paying job abroad.

For further information see [country profiles](#).

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**Future trends**

Energy and environmental legislation, cost savings and desire for public environmental credentials are a driving force in the industry. According to current projections, there is sufficient oil supply for another 40 years and natural gas for about another 100 years. However, with demand for oil and gas increasing, the cost of extraction rising, and greater care being taken of our natural resources, the industry faces a challenging future.
The renewable energy industry has expanded rapidly in recent years and continues to grow.

Photovoltaic (PV) production, which converts energy from sunlight into electricity, has been increasing by an average of some 20% each year since 2002, making it the world’s fastest-growing energy technology. Renewable energy use tends to be more labour-intensive than fossil fuels, and so a transition towards renewable energy promises more employment opportunities.

**Impending legislation**

UK energy legislation has changed greatly over the last few years to reflect the country’s necessity to meet projected energy demands as well as carbon (CO2) emission reduction targets.

The UK Energy Act 2008, the Climate Change Act 2008 and the Planning Act 2008 mark important legislative changes and indicate the country’s commitment to the climate change programme. The Climate Change Act legally binds the UK to reduce its greenhouse gas emissions by 80% by 2050.

The CRC Energy Efficiency Scheme (formerly known as the Carbon Reduction Commitment) is the UK’s mandatory climate change and energy-saving scheme. The scheme started in April 2010 and is administered by the Environment Agency (EA).

**Impact of technology**

Within the last decade, technological advances have made it possible to unlock more oil from old fields and, at the same time, higher oil prices have made it economical for companies to go after reserves that are harder to reach.

In addition, technological advances continue to improve the way energy is generated, particularly through alternative energy solutions that harness energy from natural resources.

**Demographic changes**

Population growth is the key demographic change that will affect this industry. It is predicted that by 2050 the global population will have reached 9 billion, placing increased demand on our oil and gas resources.

**Growth and reduction**

Growth areas include corporate social responsibility (CSR) and research and development (R&D) as organisations search for new and better ways to optimise energy production and find new renewable energy sources.
The UK government has set a target that by 2020, 15% of total energy consumed should be from renewable sources.

Biofuels, wind and solar are continuing to grow rapidly as sources of energy. The UK has more offshore wind energy capacity than any other country. The UK's total wind power (onshore and offshore) has now reached 5 gigawatts (GW), enough to power almost 3 million homes. The London Array, 12 miles off the coast of Kent and Essex, will be the world’s largest offshore wind farm and, when completed, will reduce CO2 emissions by 4 million tonnes a year.

**Jargon buster**

- **Appraisal well** - drilled after the discovery of oil or gas to establish the limits of the reservoir, the productivity of wells in it and the properties of the oil and gas.
- **Blowout** - accidental escape of oil and gas from a well during the drilling stage.
- **Compressor** - an engine used to increase the pressure of natural gas so that it will flow more quickly through a pipeline.
- **Consumption** - the amount of energy you use, represented by the number of kilowatt hours (kWh).
- **Decommissioning** - removal of production equipment and facilities from depleted oil fields.
- **Development well** - drilled to produce oil and gas after an appraisal well has proved the reserves sufficiently large for exploitation.
- **Downhole** - a term used to describe tools, equipment and instruments used in the well bore, or conditions or techniques applying to the well bore.
- **Downstream** - the refining, distribution and marketing of petroleum products.
- **Exploration drilling** - drilling carried out to determine whether hydrocarbons (such as oil and natural gas) are present in a particular area or structure.
- **FPSO** - floating production, storage and offloading.
- **Exploration phase** - covers the search for oil or gas by carrying out detailed geological and geophysical surveys followed by exploratory drilling.
- **MBOE** - million barrels oil equivalent.
- **Microgeneration** - the generation of heat or power by renewable or low carbon means, by individuals, businesses or communities for their own use.
- **Midstream** - refers to industry activities that fall between upstream and downstream activities. Most often applied to pipeline transportation of crude oil and natural gas.
- **Mud** - a mixture of base substance and additives used to lubricate the drill bit.
- **Operator** - company that has legal authority to drill wells and undertake production of hydrocarbons.
- **Photovoltaics (PVs)** - a type of solar power, using a process in which solar cells convert light directly into electricity.
- **Platform** - fixed structure resting on the seabed or piled into it, from which development wells are drilled to exploit an oil or gas field.
- **Plateau level** - the level of peak production reached by an oil or gas field.
- **Tour** - work shift of a drilling crew, usually 12 hours (offshore) or 8 hours (onshore).
- **UKCS** - UK Continental Shelf. The region of waters around the UK for which the Department of Energy and Climate Change (DECC) has responsibility.
- **Upstream** - the exploration for, and extraction of, crude oil and natural gas.
- **Wildcat** - speculative exploration well drilled in search of a new oil or gas accumulation.