

HARNESSING OCEAN POTENTIAL

**Provided by mother nature,
brought to you by ocean engineers.**

ELECTRICITY

brought to you by ocean engineers.

>4000

UK homes powered
by one 5 MW offshore
wind turbine¹



Offshore wind, tidal and wave energy provide potential for widespread green electricity. Current electricity generating plants are often fuelled by natural gas that is extracted from reservoirs deep beneath the ocean floor.

TELECOMMUNICATIONS

brought to you by ocean engineers.



99%

of internet communications traffic travels through submarine cables²



Cables that run across the ocean floor connect continents. The first submarine cable - a telegraph cable - was laid in 1858. Today, 1.2 million km of fibre optic submarine cables are in operation in our oceans.³

SEAFOOD

brought to you by ocean engineers.



50%

of fish caught globally for consumption is from aquaculture⁴

Seafood includes edible fish and shellfish from the sea. More than 170 M tonnes of fish are caught annually for consumption worldwide. Seaweed and other algae are also a valuable source of food from the oceans and can be harvested from wild stocks or cultivated.⁴

GOODS

brought to you by ocean engineers.



90%

of world trade
is carried
across the
oceans by ship⁵



A global shipping fleet of more than 178,000 vessels facilitates intercontinental trade, bulk transport of raw materials, and import/export of food and manufactured goods. Oil, gas, coal, mineral ores for making metals, grain, cars, construction and agricultural machinery, and nearly everything we buy in shops from furniture to our clothes and food, travels by ship.⁵

TRANSPORTATION FUEL

brought to you by ocean engineers.



30%

of crude oil comes from offshore resources⁶



Transportation industries consume more crude oil than any other sector. Transportation fuels – for cars, lorries, ships and aeroplanes - account for over 2/3 of crude oil consumption.⁷

PETROCHEMICALS

brought to you by ocean engineers.

Demand for **plastic** is the key driver for **petrochemical demand**



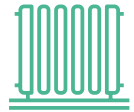
Petrochemicals are chemicals derived from oil and gas and are used in many thousands of non-fuel products. Most plastics, synthetic fibers (such as polyester and nylon), resins, fertilizers, pharmaceuticals, detergents and asphalt are produced from petrochemicals.⁸

GAS

brought to you by ocean engineers.

40%

Domestic use of gas as percentage of total UK consumption⁹




Natural gas is used directly for heating, cooking and is burned in power stations to generate electricity. Natural gas can be cooled to become a liquid and used as a transportation fuel.

This brochure forms part of the public awareness raising activities of the Royal Academy of Engineering Chair in Emerging Technologies in Intelligent & Resilient Ocean Engineering.



Chair in Emerging Technologies: Intelligent & Resilient Ocean Engineering

Harnessing benefit from our oceans more efficiently, with less impact on the environment, and with more capability to project human influence with lesser risk.

 **Find out more**
www.southampton.ac.uk/iroe

¹ <https://www.renewableuk.com/general/custom.asp?page=UKWEDEexplained>

² www2.itif.org/2019-submarine-cables.pdf

³ <https://www2.telegeography.com/submarine-cable-faqs-frequently-asked-questions>

⁴ www.fao.org/state-of-fisheries-aquaculture

⁵ www.ics-shipping.org/shipping-facts/shipping-and-world-trade

⁶ www.statista.com

⁷ <https://www.iea.org/data-and-statistics>

⁸ www.americangeosciences.org/geoscience-currents/non-fuel-products-oil-and-gas

⁹ <https://www.gov.uk/government/statistics/natural-gas-chapter-4-digest-of-united-kingdom-energy-statistics-dukes>