UN environment
United Nations Environment Programme

OIL FOR DEVELOPMENT

IPIECA

UN environment WCMC

Industry overview of the upstream oil and gas sector

Module 1a

Contents

IPIECA

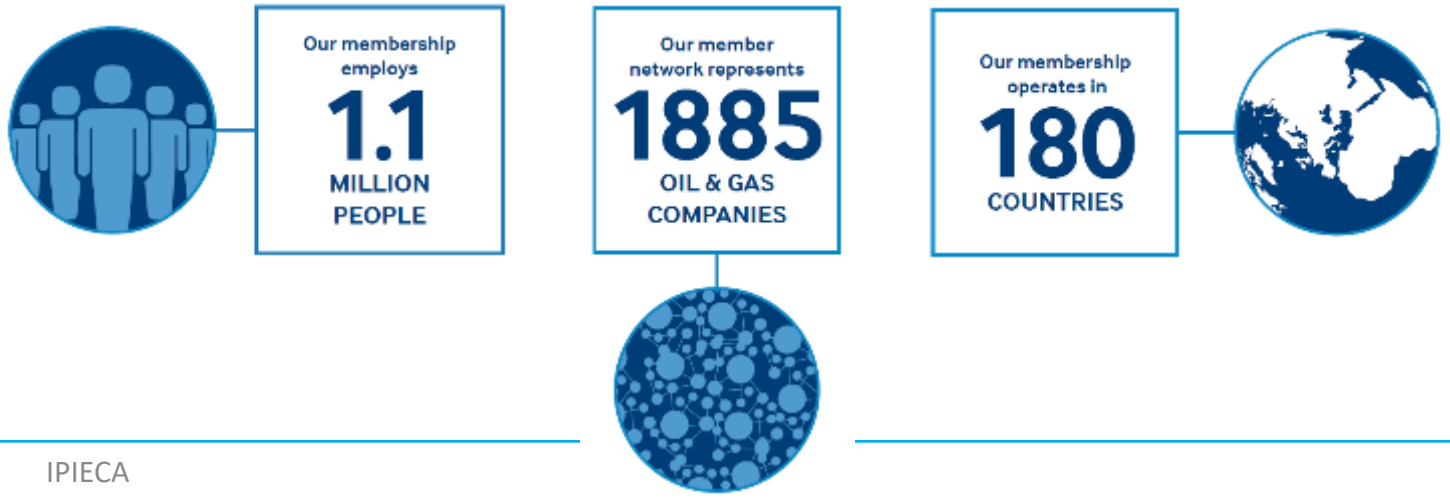
Global oil and gas industry association for advancing environmental and social performance

Vision:

To advance the oil and gas industry's environmental and social performance and contribution to the energy transition in the context of sustainable development.

Only global association involving both upstream and downstream

45 years of collaboration contributing to sustainable development



IPIECA Members

Companies

Associations

Cross-Sector Biodiversity Initiative

Cross Sector Biodiversity Initiative

ICMM International Council on Mining & Metals

IPIECA

EQUATOR PRINCIPLES

CSBI provides a forum for cross-industry collaboration and learning on biodiversity best practice amongst the oil and gas, mining and finance sectors.

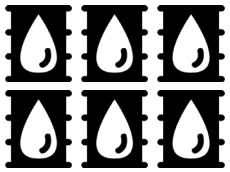
The CSBI develops cross-sector guidance.

http://www.csbi.org.uk/

Oil and gas in the 21st century

This industry accounts for >57% total global fuel consumption

Average ~96.3 million barrels of oil / day in 2016 = 2 L / person on earth / day

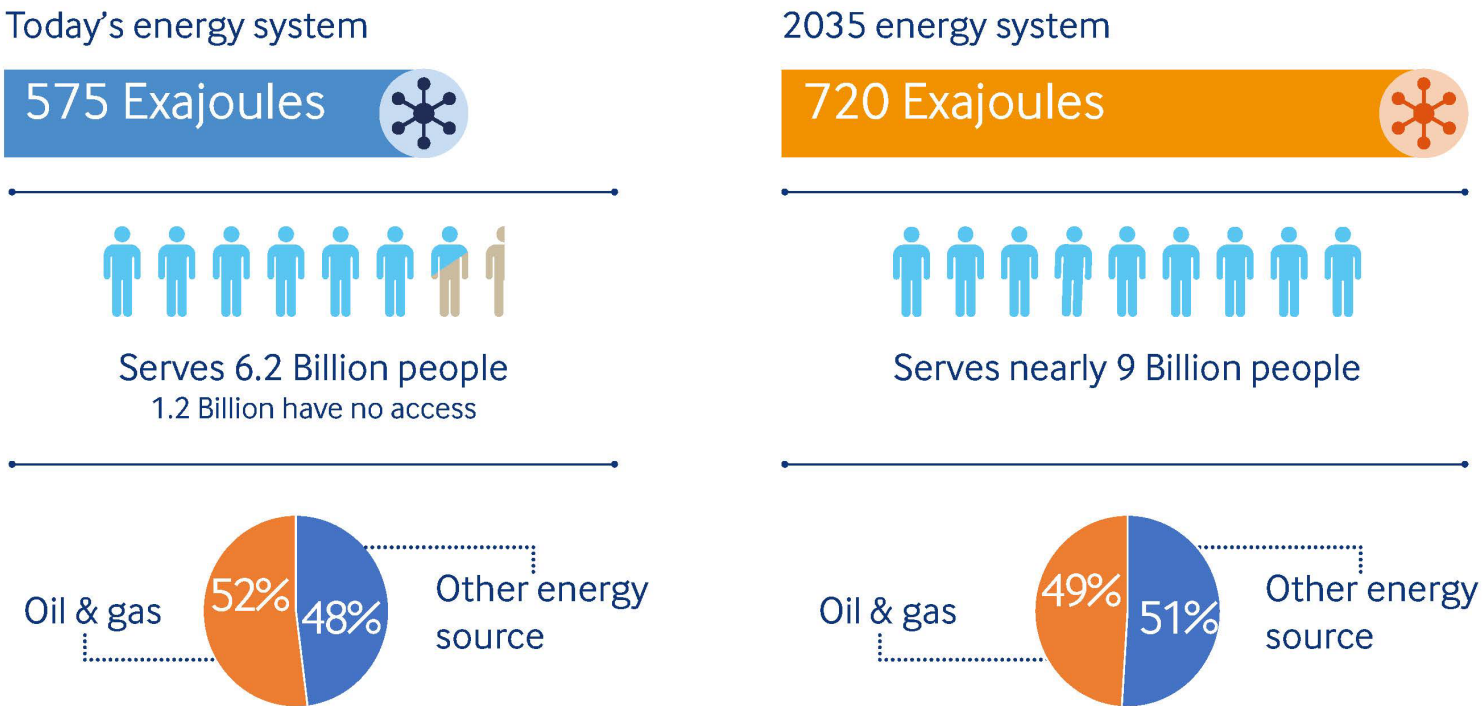


Upstream oil and gas expected to invest ~$700 billion / year until 2040 to help meet global energy demand

- 3/4 of this occurs in non-OPEC countries

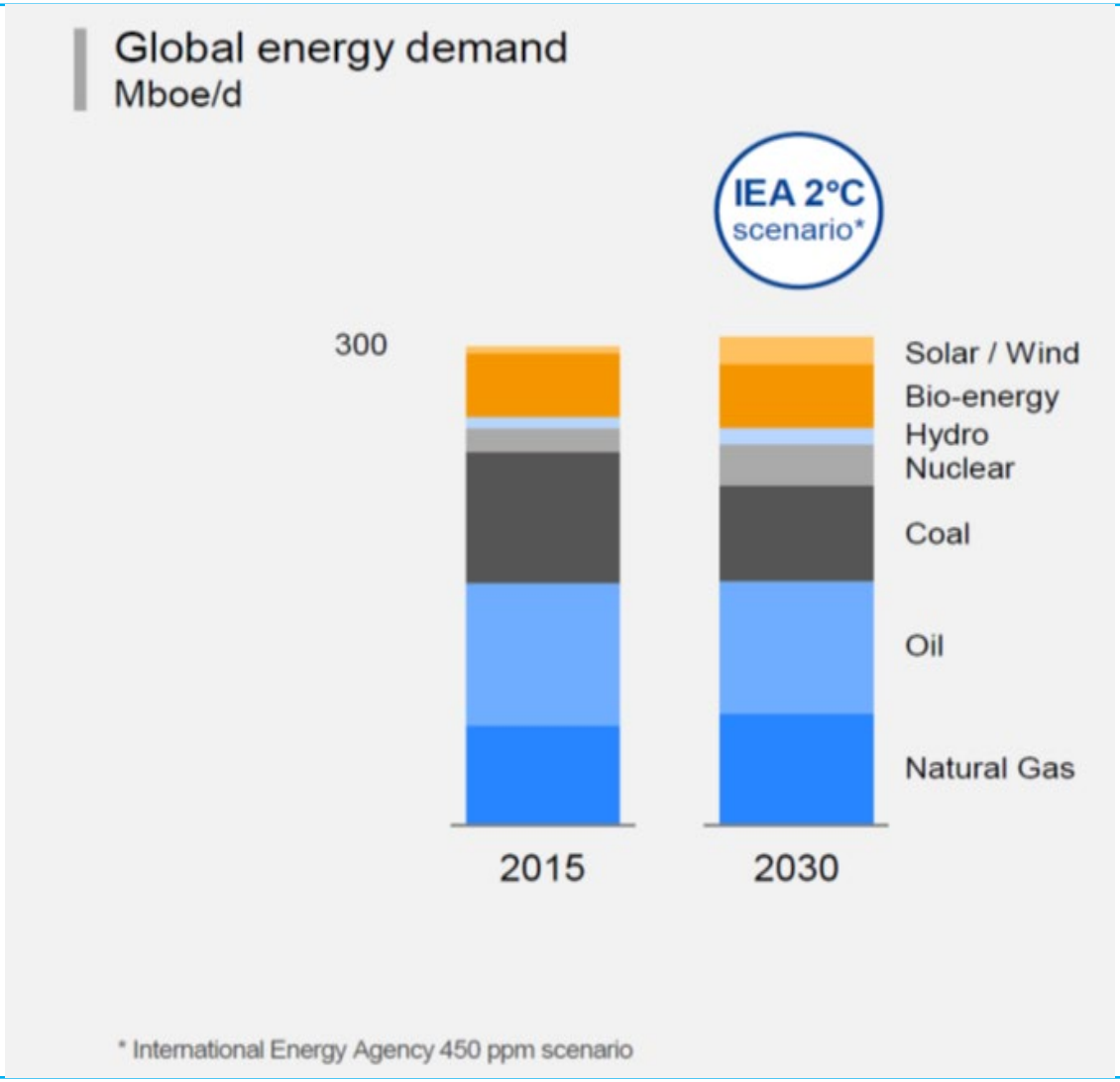
Oil and gas in the 21st century

Access to affordable reliable energy is essential for the growth of strong economies, sustained improvements in the quality of life, and the eradication of poverty.



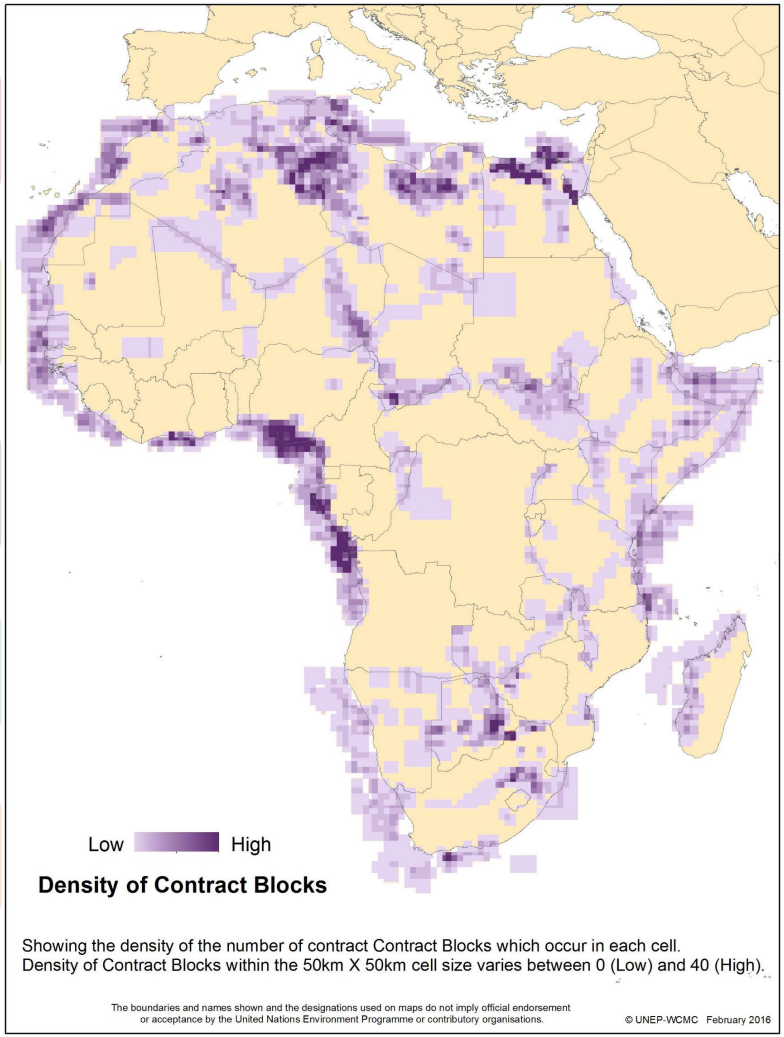
Mapping the oil and gas industry to the Sustainable Development Goals: An Atlas **IPIECA, 2017**
http://www.ipieca.org/resources/awareness-briefing/mapping-the-oil-and-gas-industry-to-the-sustainable-development-goals-an-atlas/

World energy demand



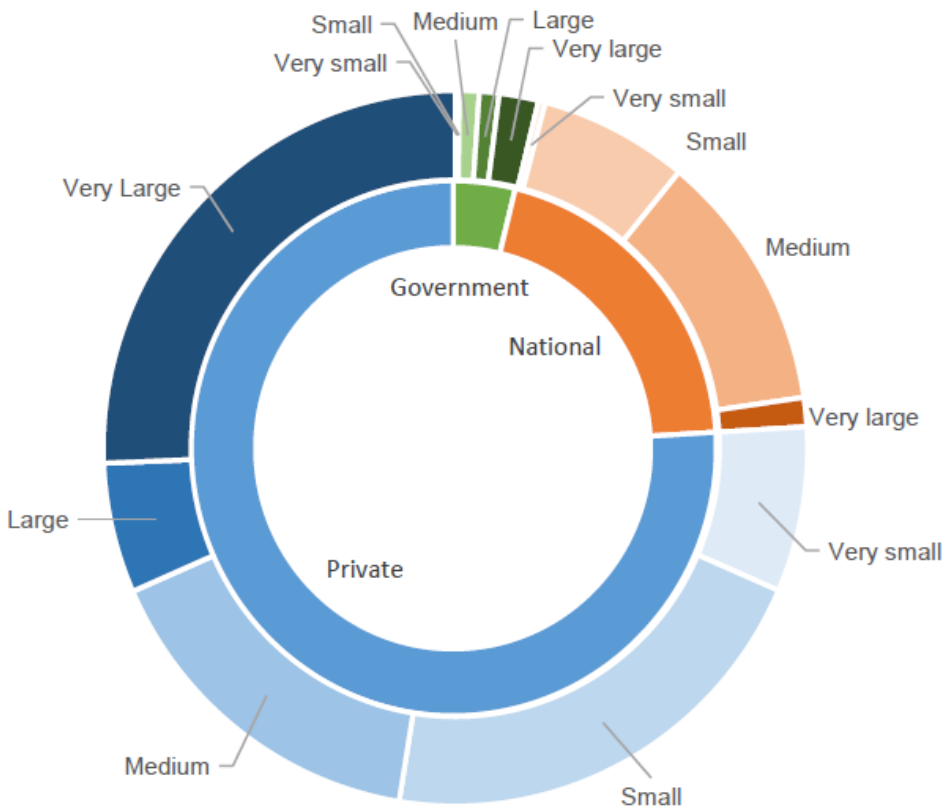
Africa's oil and gas potential

8.9m km^2	• Area of oil and gas concessions
20%	• Land area covered by oil and gas concessions
19%	• Exclusive Economic Zone
2,719	• Number of concessions
520	• Approximate number of companies with interests



UNEP-WCMC, 2016

A variety of companies



UNEP-WCMC, 2016

How can oil and gas support sustainable development?

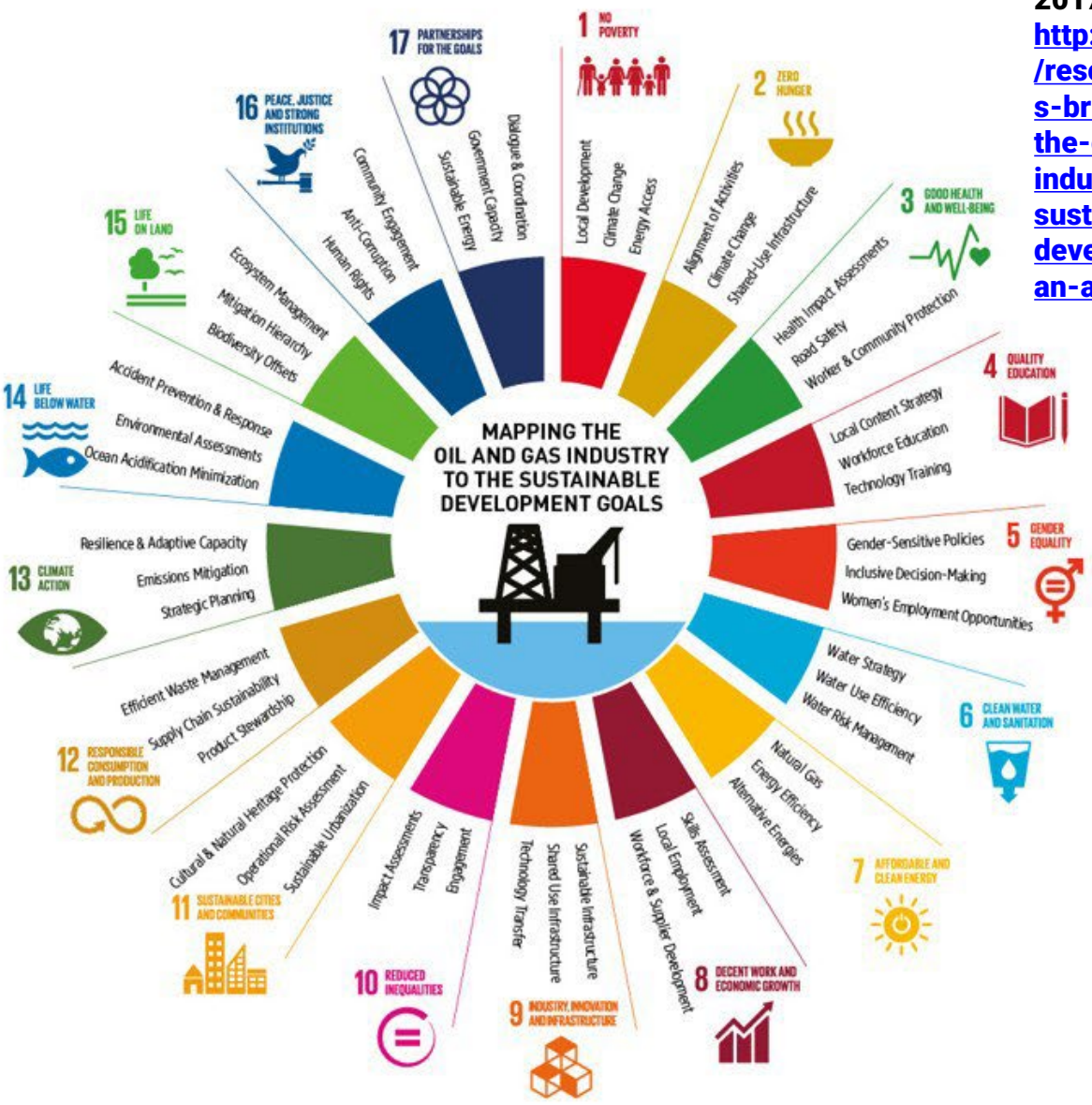
Mapping the oil and gas industry to the Sustainable Development Goals: An Atlas **IPIECA, 2017**
http://www.ipieca.org/resources/awareness-briefing/mapping-the-oil-and-gas-industry-to-the-sustainable-development-goals-an-atlas/

Oil and gas can play a significant role

MAPPING THE INDUSTRY TO THE SDGs

The oil and gas industry is committed to responsible and sustainable business, as well as serving as an essential partner to meet the challenge of achieving the SDGs.

The oil and gas industry has the potential to contribute to all 17 SDGs.



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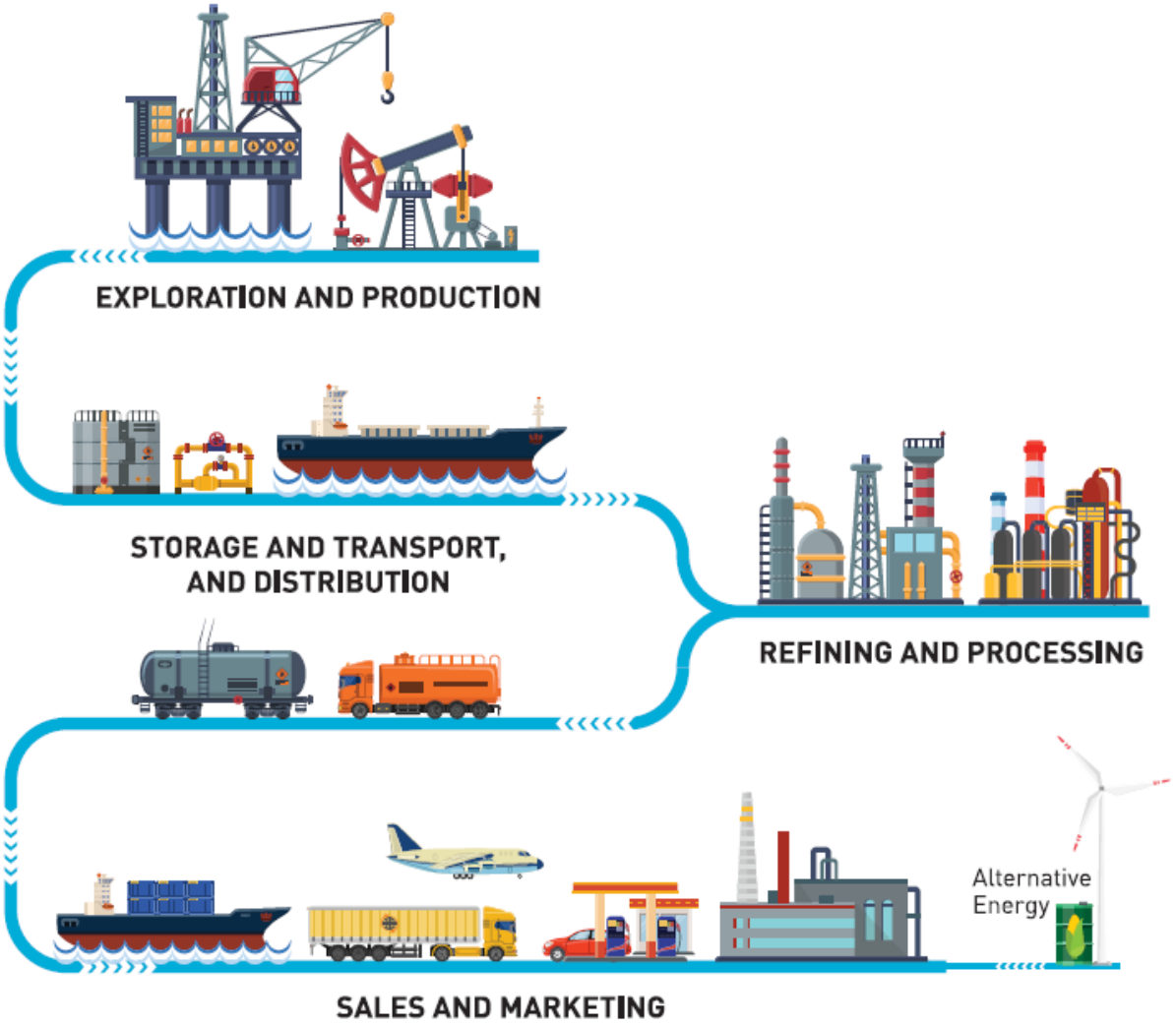
How the industry works

Value chain



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Exploration and production (upstream)

1. Assess geology to locate source rock
2. Air surveillance to locate potential area
3. Seismic interpretation to further assess potential reservoir
4. Exploration/appraisal wells drilled to determine presence/absence of hydrocarbons and decide most productive location well development
5. Company decides on best approach for development (type of well, drilling method etc.) and production begins
6. At end of production lifetime: field and infrastructure are decommissioned

Refining and processing

- **Hydrocarbons extracted vary in quality and content**
- **Oil and gas must be processed – there are various stages of refining and processing resulting in different products:**
  - Natural gas
  - Natural gas liquid
  - Crude oil (gasoline, diesel, fuel oil etc., solvents, polish, detergents, synthetic fibres and so on)

Storage, transport and distribution

- **O&G must be stored once extracted – it can be held onshore, offshore and subsurface.**
- **Reliable storage is important for both transportation and to regulate/respond to demand.**
- **O&G then transported using pipelines, rail, trucks and ships, all with their own associated infrastructure.**

Sales and marketing

- **Various transport options are used to distribute products to industry, for:**
  - Commercial and domestic use.
  - Power generation.
- **Some O&G producers extract, process, market and sell their own products, others sell the hydrocarbons on for others to process and distribute.**

Upstream life cycle

EXPLORATION AND PRODUCTION

Assess
exploration

Select
project concept

Define
project concept

Execute
project and construct

Operate

Reclaim
Close/ decommission

Following slides developed from Darko E (2014) Short guide summarising the oil and gas industry lifecycle for a non-technical audience. Overseas Development Institute, London

Upstream life cycle

- **May last 1-5 years.**
- **Geological surveys used to locate source rock.**
- **Government seeks investment for own exploration or grants access for firms to explore, through direct negotiation or bidding processes.**

Upstream life cycle

- **(part of the 1-5 year assessment and selection phases).**
- **Where potentially viable oil/gas sources are identified, further exploration will occur.**
- **Companies will develop work plans for the next phase.**

Upstream life cycle

- **May last 4-10 years.**
- **Plans are further defined for operation, some limited infrastructure and site development may be put in place.**

Upstream life cycle

- **May last 4-10 years.**
- **Some exploratory and initial drilling may take place.**
- **The site will be further developed to put the infrastructure in place ready for full production capabilities.**
- **Some of the first oil/gas will be produced towards the end of this phase.**

Upstream life cycle

- **May last 20-50 years depending on the reservoir type.**
- **Oil/gas reserves are being extracted and transported for processing and distribution.**
- **It is possible to estimate the amount of hydrocarbons in the field, but it is never certain, so volume and length of production is hard to predict.**
- **Production will fluctuate over the duration of operations, different extraction approaches may be used at different times to aid in extraction.**

Operate – ‘in reality’

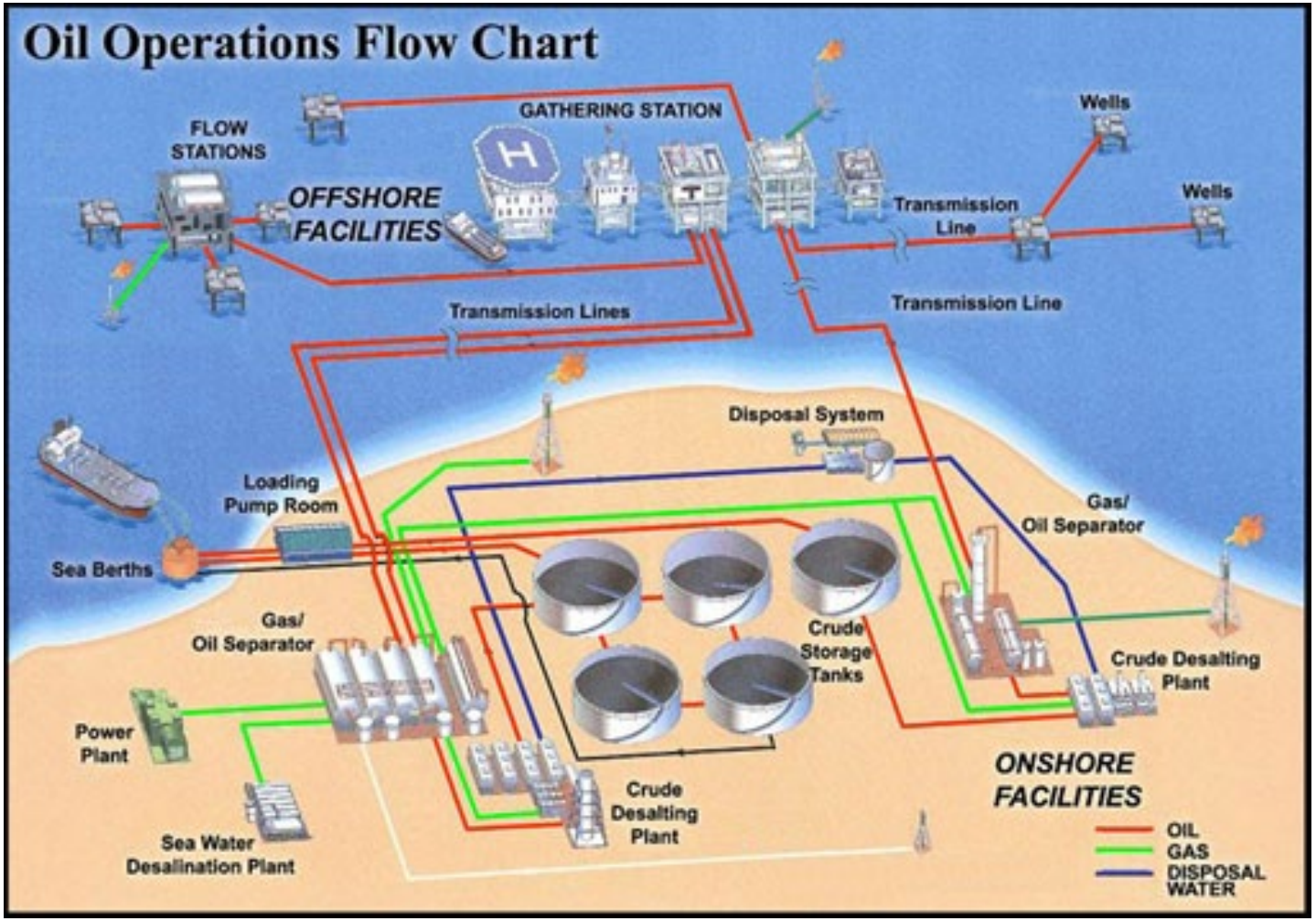

Diagram sourced from Toyo Engineering Corporation http://www.toyo-eng.com/jp/en/products/oil_and_gas_development/seaoilmine/

Upstream life cycle

- **May take 2-10 years.**
- **Once it is no longer cost-effective to extract remaining reserves, the site is decommissioned.**
- **Operators are typically responsible for returning the site to as close to original state as possible according to regulations/ standards/ original agreements.**
- **Long-term environmental monitoring may be required.**