THE OXFORD INSTITUTE FOR ENERGY STUDIES

A RECOGNIZED INDEPENDENT CENTRE OF THE UNIVERSITY OF OXFORD

UNIVERSITY OF OXFORD

Operating Costs and Paying the Government (5)

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The Economics of Energy Corporations (2)

Outline of the course

Overall objective – understand how senior management use economic models to make investment decisions

1. Introduction to key themes in the global energy market
2. Introduction to financial modelling as a management tool
    1. Understanding some key concepts
3. Starting two models for an oil and a gas field – revenues and prices
4. Inputting the costs – capital expenditure
5. **Operating costs and paying the government**
6. A power plant – a buyer and seller of energy
7. Calculating a discounted cashflow
    1. Why is it important
    2. How is it used to make decisions
8. Testing the investment decisions: running some numbers under different assumptions
9. Answering your questions

Operating Costs

Key Assumptions

- Lifting costs – getting the oil out of the ground
  - Electricity
  - Rig costs
  - Employment costs
- Transportation – moving the oil to market
  - Pipeline distance and tariffs
  - Shipping costs and distance
  - Truck or rail freight
- Operating taxes
  - Royalties
  - Export tax
  - Production sharing agreement
  - Other local taxes

Contrasting operating costs

North Sea

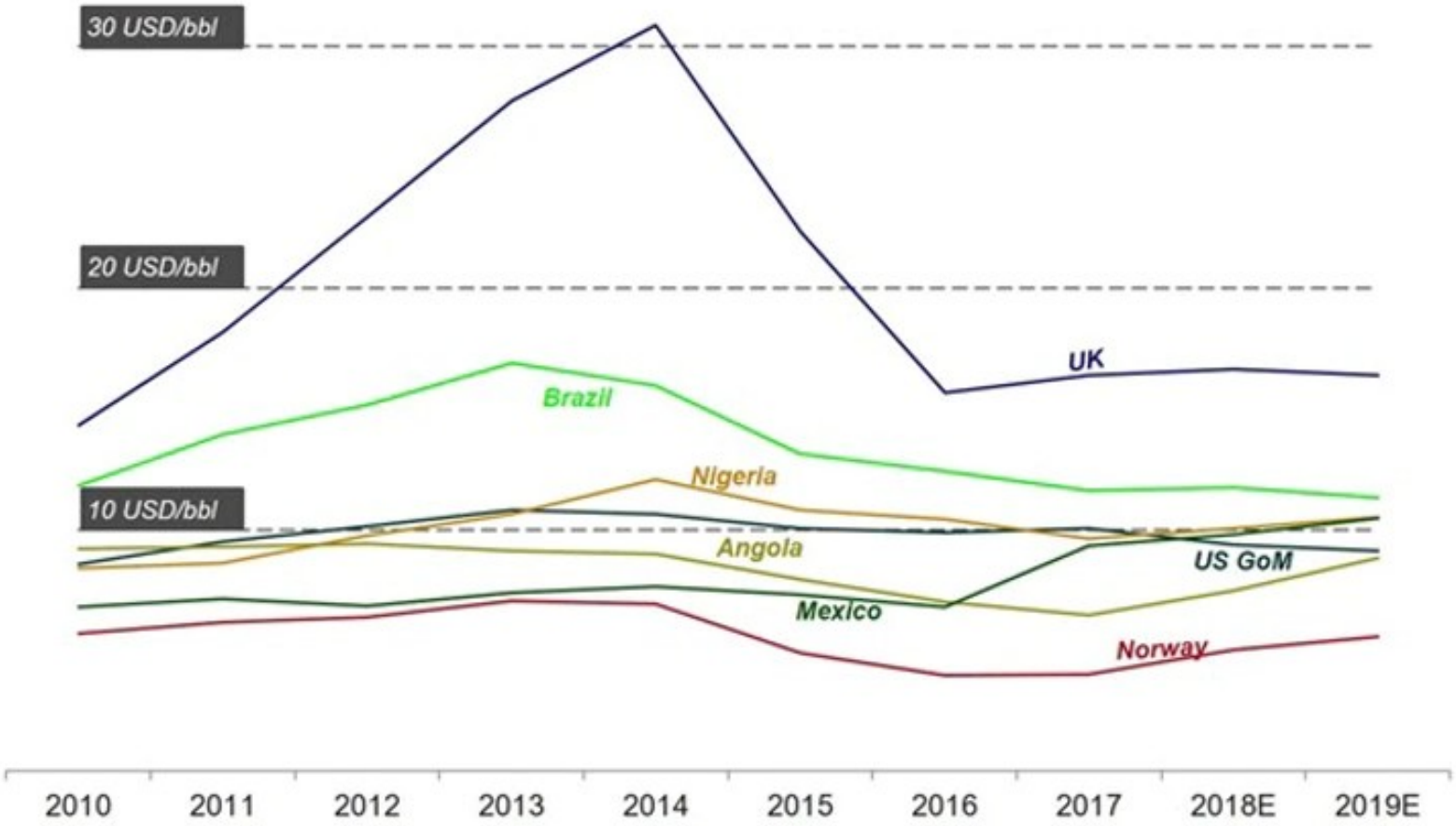
- Tough environment
- Remote location
- Relatively small reserves
- Higher costs per barrel

Saudi Arabia

- Huge reserves located in close proximity
- Potential for large synergy benefits
- Relatively benign operating environment
- Low costs per barrel

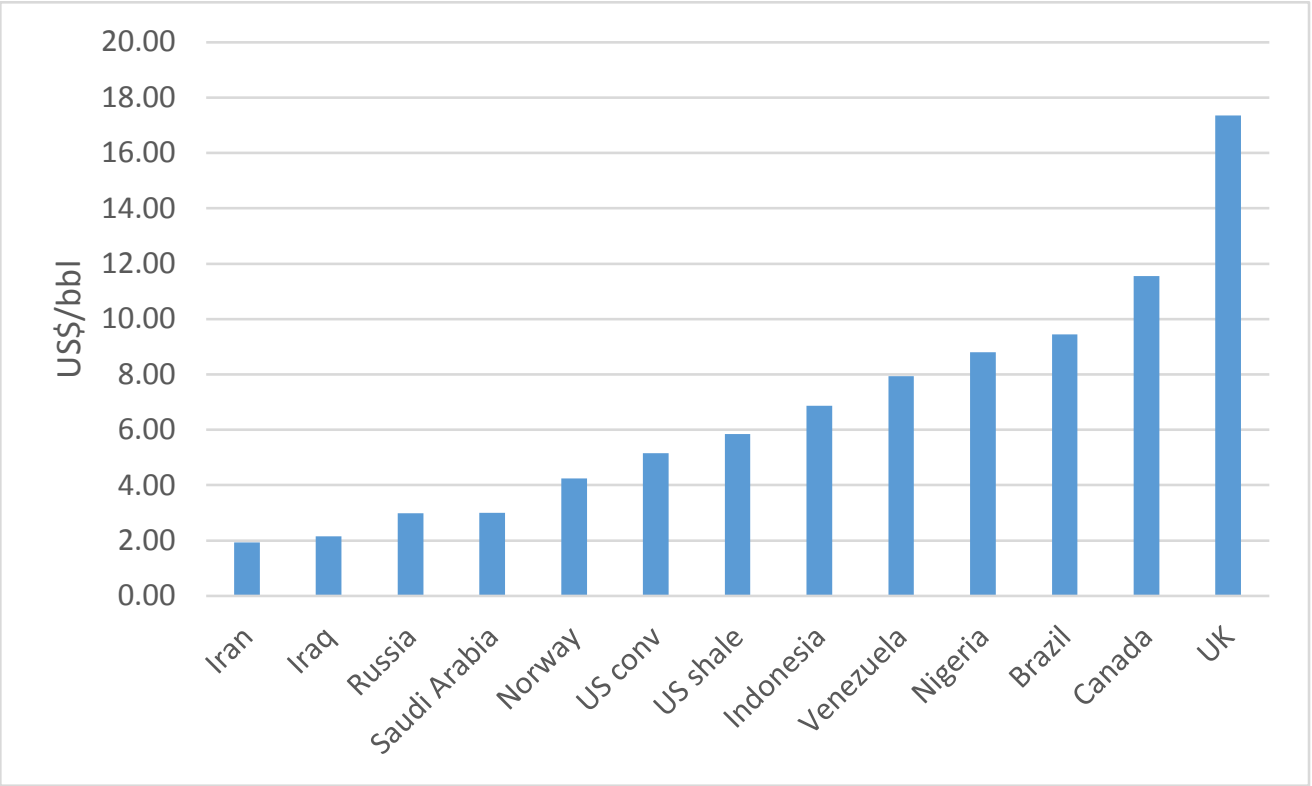
Contrasting operating costs

Figure 1: Offshore production opex for oil fields in the main offshore regions*
Operational expenditure (opex) per barrel of oil equivalent (boe)



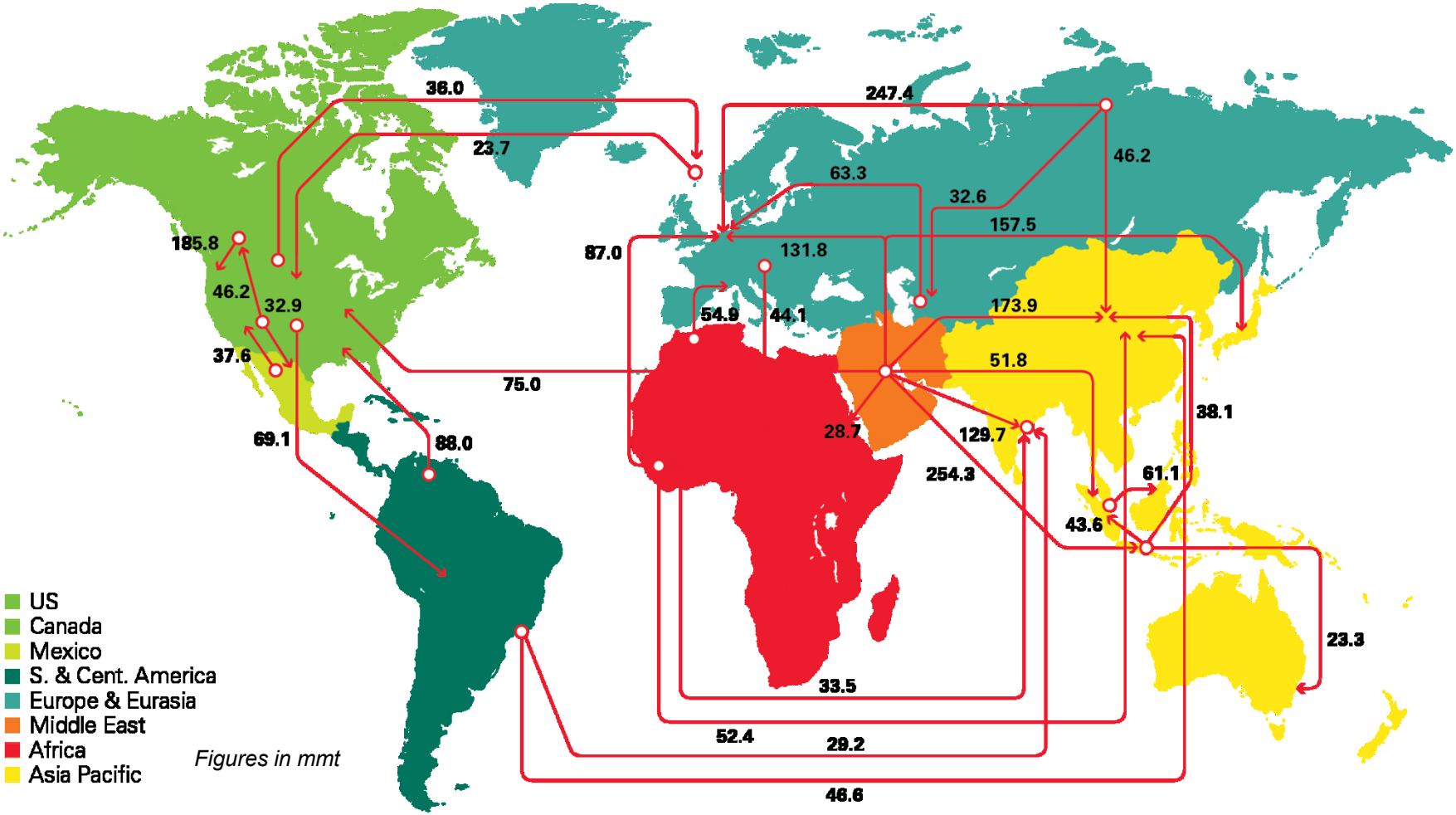
* Excludes transportation opex
Source: Rystad Energy ServiceDemandCube

Lifting Costs



- Generally calculated by local experts with knowledge of specific environment
- If a general assumption is needed, then company or country metrics can be used

Oil is a global commodity

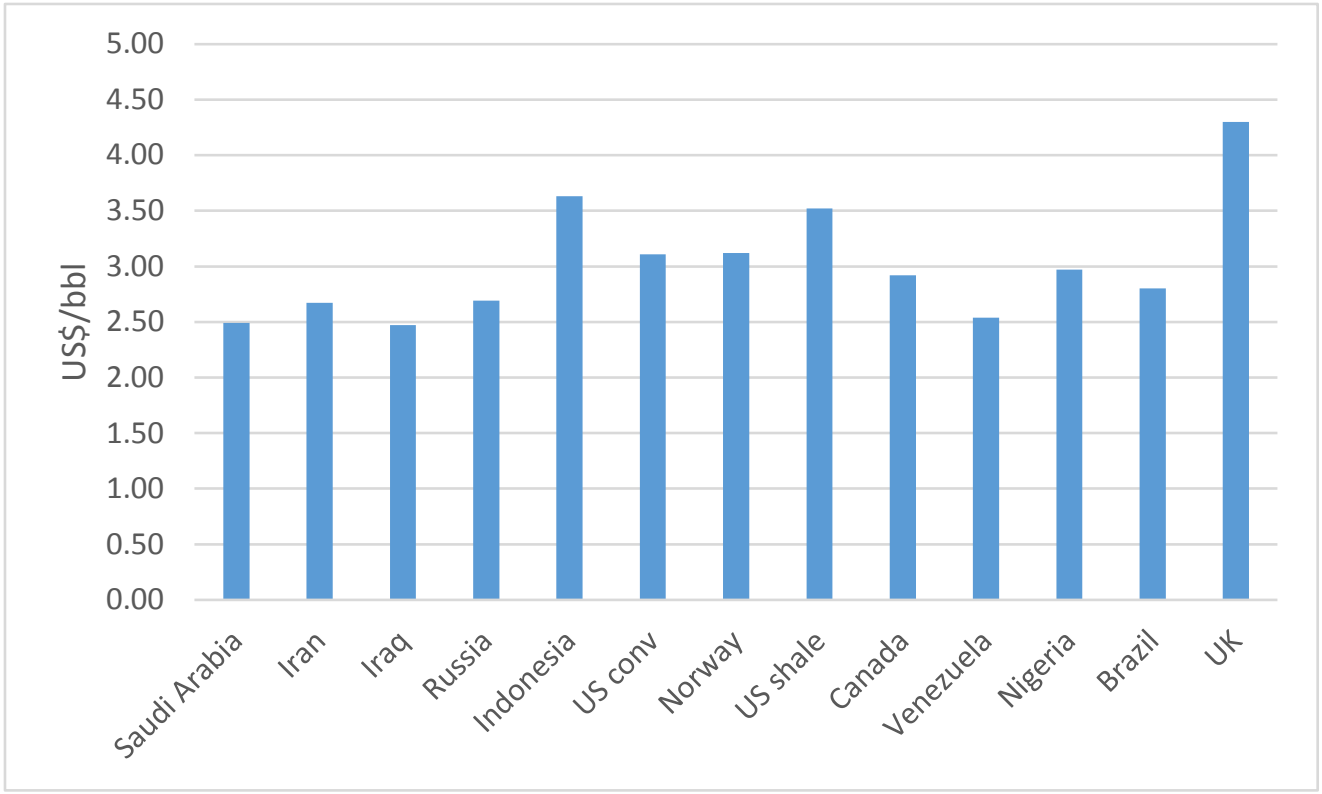


- Oil is traded in multiple directions across the globe
- Much of the trade originates from the Middle East and flows West and East
- Prices are set relative to a set of global benchmarks

Russia’s huge pipeline system

Oil tanker and the Panama Canal

Transportation Cost

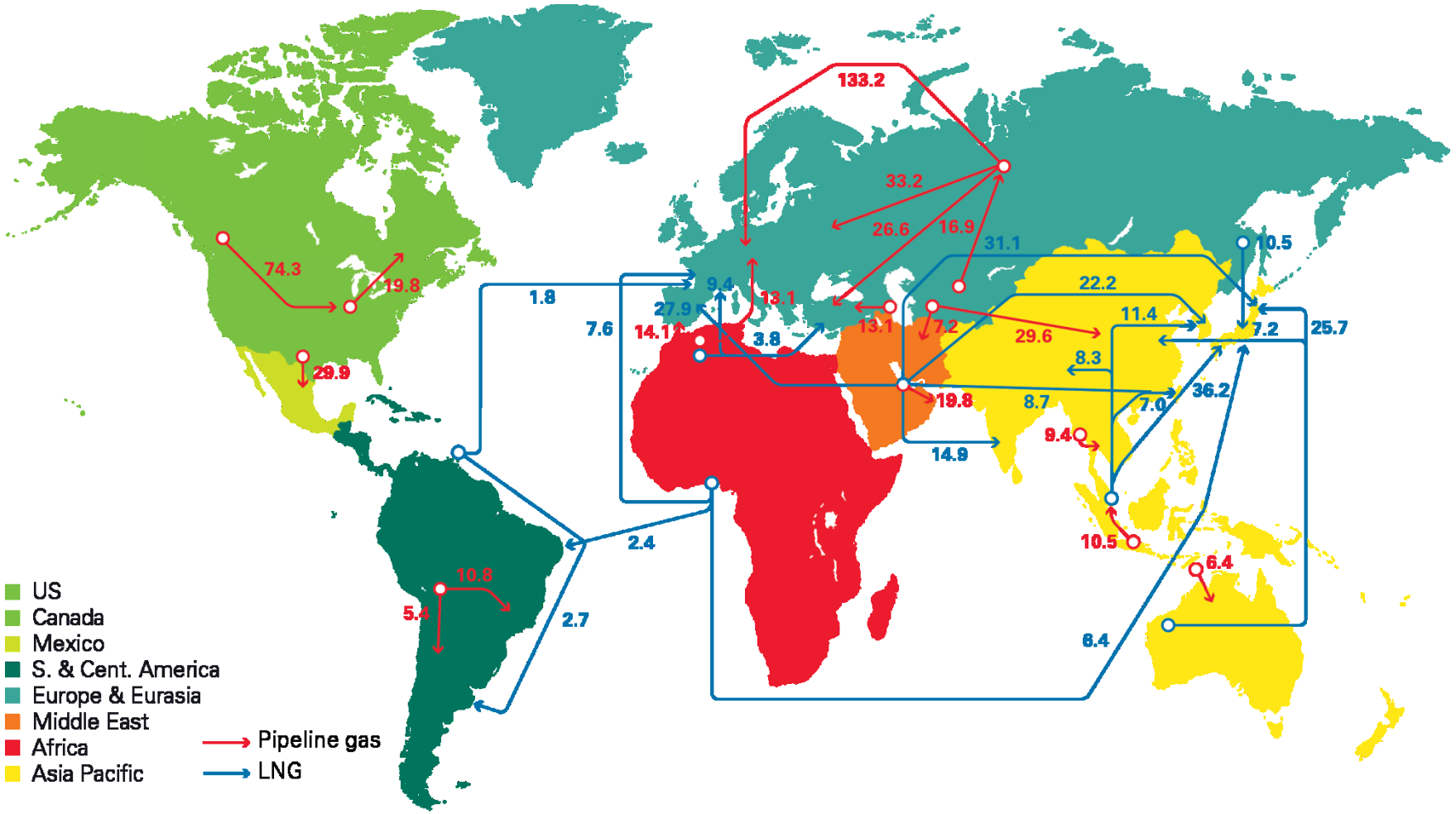


- Main driver of cost is distance
- Mode of transport also important – onshore pipelines versus offshore tankers
- Most expensive is rail or truck transport, due to lower individual volumes

Gas transportation can get complex

- Gas is also transported by pipeline and ship
- Pipelines have dominated, but LNG is globalising the gas market
- Liquefaction and regasification then become an integral part of the value chain
- Costs are increased, but new markets can be accessed
- From a modelling perspective, LNG plants are included in capex, while shipping and regas costs are generally included in transport
- Shipping tariffs are based on journey time (days) multiplied by freight rates, which can vary significantly over time

Gas trade flows (bcm)

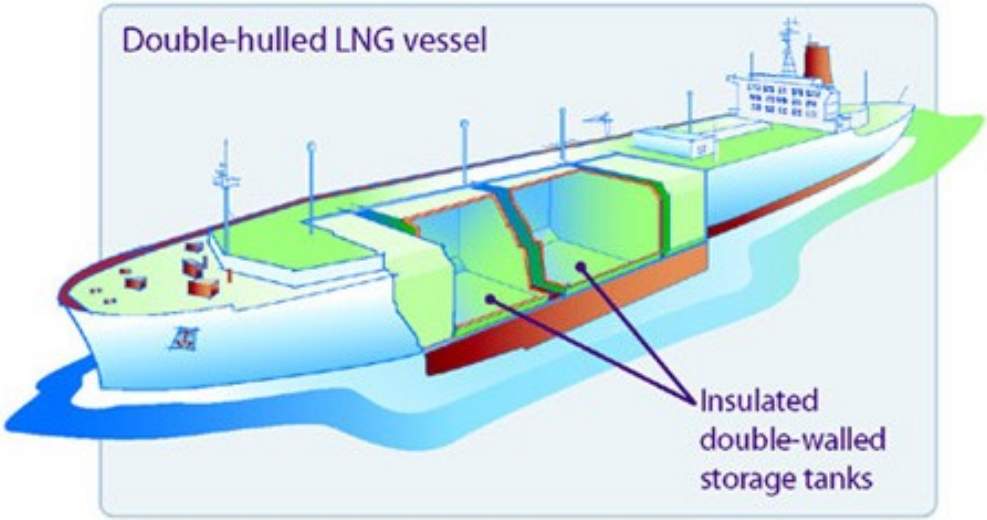


- Gas trade flows via two transport methods – pipeline and LNG
- Historically pipeline flows have dominated, leading to regionalisation
- LNG is now turning gas into a more global commodity

Long Distance Pipeline

Yemen Liquefaction Facility

LNG Tankers


Double-hulled LNG vessel
Insulated
double-walled
storage tanks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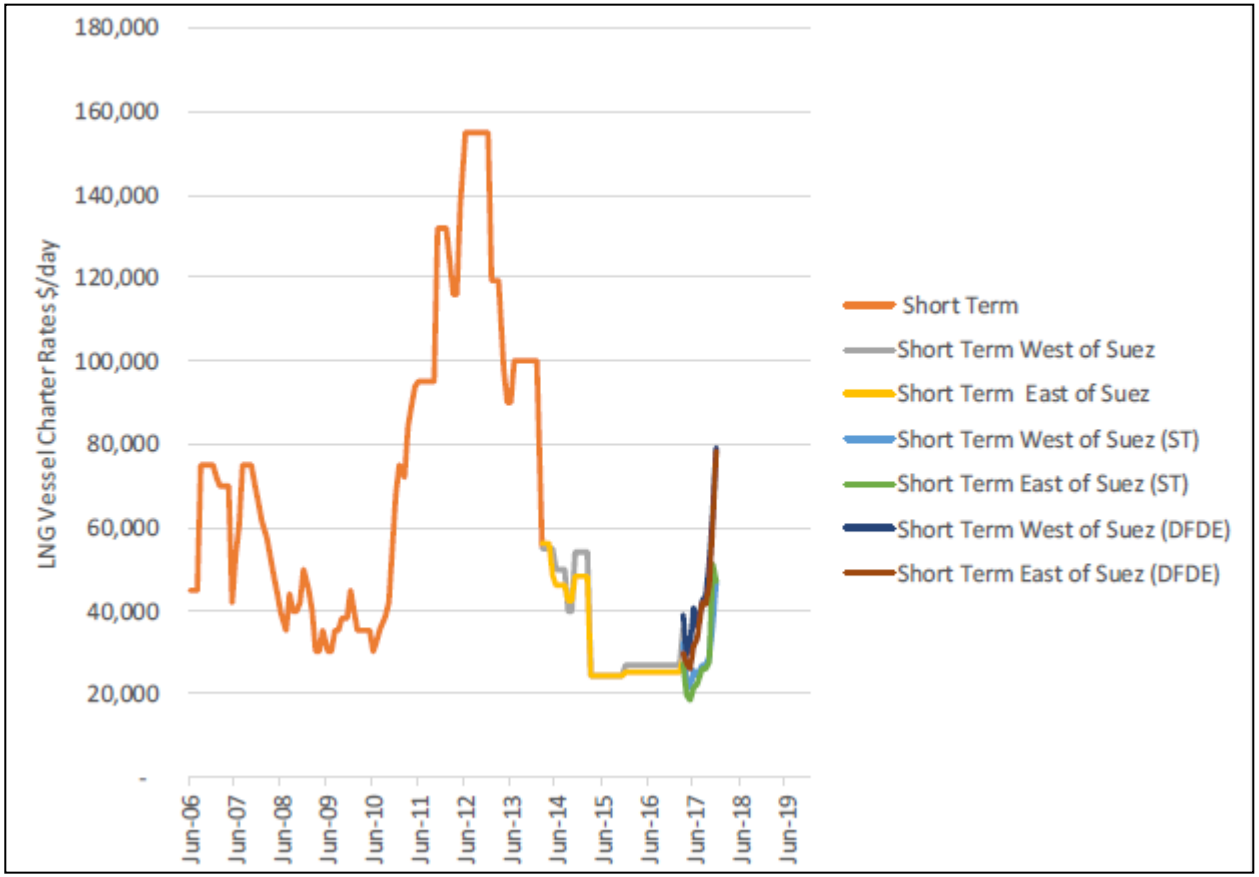
GOLAR MAZO
L N G

LNG tanker freight rates



- Significant volatility driven by LNG demand and ship-building investment

LNG Import and Regas Terminal Jurong Island, Singapore

Taxation

Tax and Royalty Regime

- The most common tax regime includes operating taxes and profit tax
- Operating taxes are normally taken from revenues
  - Export tax (on export revenues only)
  - Royalty (on all production)
  - Specific local or regional taxes (for regional government support)
- Revenue taxes are simple to collect, but can be penal because they do not take investment costs into account
- Sometimes governments alleviate the risks of revenue taxes by introducing a sliding scale relative to the oil price

Types of taxes

- Export Tax
  - Normally a % of export revenues
  - Occasionally banded by oil price ranges
  - Focus tax on premium market and prices
- Royalty
  - Ensures that government gets a minimum amount of revenue
  - Can be a % of overall revenues or a fixed amount per barrel of production
  - Very regressive, as takes no account of cost recovery, but very easy to collect to favoured in countries with dubious accounting regulation
- Regional taxes
  - Levied by local governments to support regional infrastructure
  - Often used to fund schools, hospitals etc.
  - Can be open to significant negotiation
- Corporate Tax (Profit Tax)
  - Levied after all costs have been taken into consideration (including other taxes)
  - Often a complex calculation, but does allow for reclaiming of expenses

The Key is Cost Recovery

- Can you get your money back before you start paying higher taxes
- The sooner you recover your money the better for your project economics
- Revenue taxes do not allow for cost recovery
- Depreciation offers some element of cost recovery in a tax and royalty scheme
- Another term for it is “cost oil”, which is used in Production Sharing Agreements (PSAs)

Depreciation

- Depreciation is an allowance against profit tax
- An accounting calculation to reduce “pre-tax profits”
- Has no cash impact
- Reduces corporation (profit) tax and effectively allows cashflow to the company to be increased
- Encourages a faster recovery of costs, although not perfect
- PSA Cost oil has the same impact, and is a subject of fierce negotiation

Production Sharing Agreements

- Specific tax and legal regimes for individual projects
- Negotiated with government before first investment is made
- Legally guaranteed for the life of a project (although this is not always the case)
- Normally based on a split of **cost oil** and **profit oil**, although can also include a royalty payment
- Cost oil allows the company a larger share of revenues until costs are recovered
- Profit oil is the split of revenues after costs have been taken into account – it tends to increase in importance once costs have been recovered
- Governments sometimes also demand a royalty in order to guarantee a minimum amount of revenue immediately