Global Offshore Prospects

SUT, Imperial College, London. 18th January 2018

Westwood Global Energy Group

01 Introduction

About Us

Westwood Global Energy Group **("WGE" or "Westwood")** was formed in January 2015 by Energy Ventures, an energy specialist private equity firm with a vision to build a leading player in the business intelligence and data analytics space.

Westwood today comprises of the complementary expertise, products and services of six industry leading brands: Hannon Westwood, Douglas Westwood, Richmond Energy Partners, Novas Consulting, JSI Services and Energent Group.

We help clients make informed commercial and strategic decisions through a combination of proprietary data, insights and knowledge.

Our core business lines are:

Research

- Our research analysts provide insightful and timely independent research, underpinned by proprietary databases and analytical tools.

Consultancy

- Our consulting professionals excel in the provision of unbiased commercial advisory services, underpinned by focused independent research.

> "At Westwood we commit to deliver industry research that is **insightful**, **reliable**, **credible** and **relevant**, and above all, **independent**. It is our intention that Westwood Global Energy becomes recognised as a highly valued provider of research and insight across both the E&P and Oilfield Services sectors. With a distinctive brand we will offer more while maintaining the **depth** and **quality** that our legacy stands for. We look forward to this next industry cycle with anticipation."
>
> - ***Gavin Prise, Executive Chairman***

Blue-chip client base including corporates, financial institutions, investment houses, government agencies and industry bodies...

Global insights supported by local presence – c. 50 professionals across the key energy hubs of **Aberdeen**, **London**, **Houston** & **Singapore**...

Trusted and recognized underlying brands ...

powered by insight

Covering the full aspect of the global energy value chain from **upstream** to **downstream** and **power generation** ...

WGE Research Products

WGE Online Tools Sectors

Sectors

Sectors empowers the global oilfield services industry to capture new opportunities for growth and investment by providing clarity through real-time access to intelligence, data, and insight

- Global database of oil and gas production, field developments and drilling activity
- Commercial insight for sales and business development, strategy support and investment opportunity support

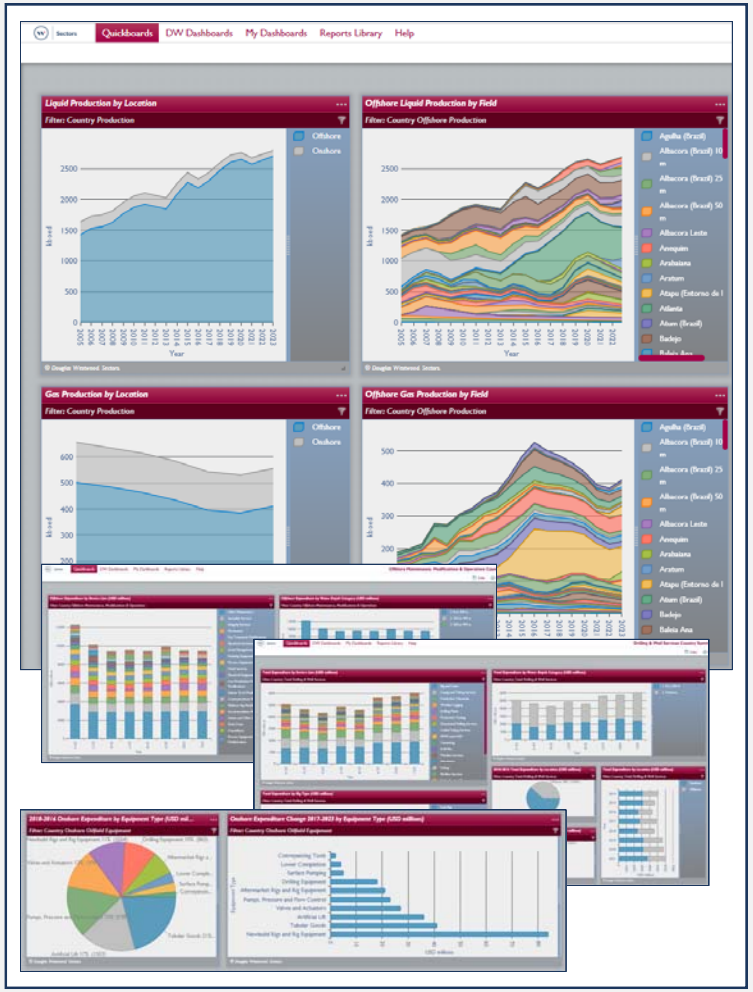
✓ **Instant access to research reports, trends and insights for the global oilfield industry**

✓ **Interrogate, screen and visualise complex data**

✓ **Filter by a range of field attributes to build profiles**

✓ **Forecast accurately, mitigate risk, and make well-informed strategic decisions based on the latest data and insight**

✓ **Benchmark in-house research and analysis**



2,523 fields across 1,463 projects

Historic data back to 2005

~150bn barrels of future production, 110bn barrels of historic production filterable on a field-level

42 field attributes - includes country, region, offshore details, production increments, cumulative produced volumes

Forecasting from 2017-2023 65 countries in the coverage. Expansion planned for the next 12 months

Access to 65 pre-built drilling and production PDF report quarter updates

WGE Research Products

WGE Online Tools Energent

Energent

Energent tracks and benchmarks oil & gas trends in top US shale plays, with research, apps and data updated daily. Helps sales and marketing teams commercialise new products, work with up to date operator data and track well completions

- Focused on well life-cycle and frac market intelligence.
- Enables the user to create data driven market forecasts and asses well, frac sand and OCTG market potential by operator for a defined area

✓View nationwide frac sand and proppant trends across all basins

✓Review fluid system and volumes per well

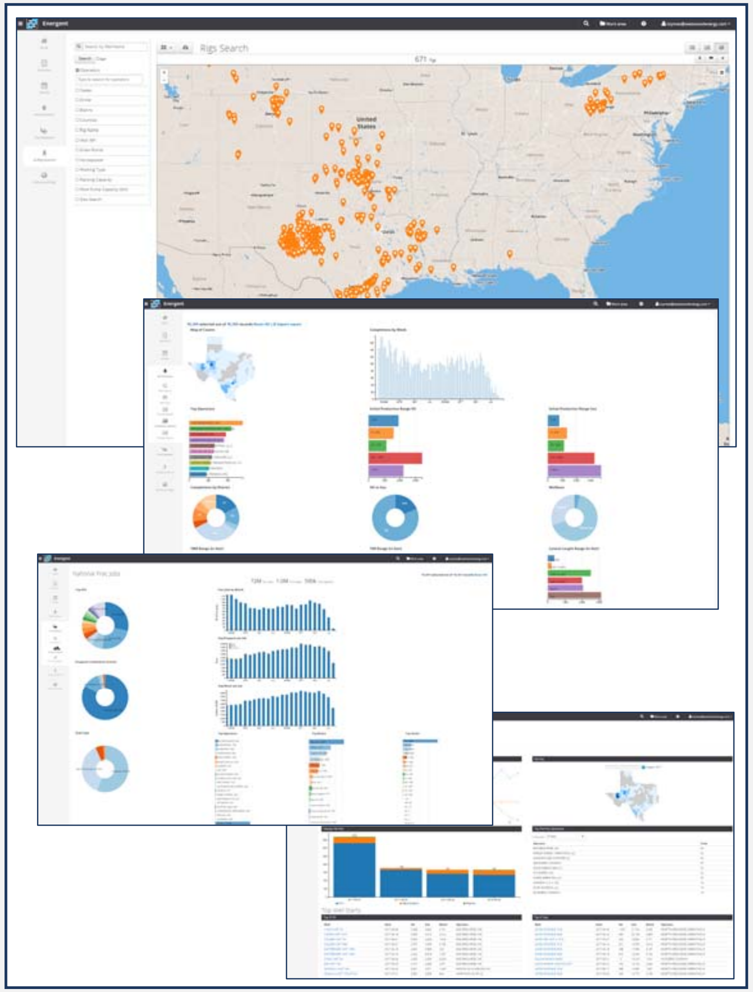
✓Analyse combination of proppants used per well across plays

✓Determine pressure pumper and operator relationships by basin

✓Compare well cohorts on maps, list, table and charts

✓Customized analysis with well details alongside your proprietary data

✓Identify near term opportunities by understanding operator forecasts



Tracks 1,700,000 US Wells

Historic data back to 2005

Benchmark wells using key efficiency, completion and production metrics

Comprehensive well and frac data includes state, basin, counties, well orientation, operator, spud date, fluid type and more

Weekly US rig counts includes operator, driller, basins, counties, well API, draw works, horsepower and more

Review and analyse data from 3,500+ E&P operators, 100+ Drilling Contractors & 150+ Oilfield service companies

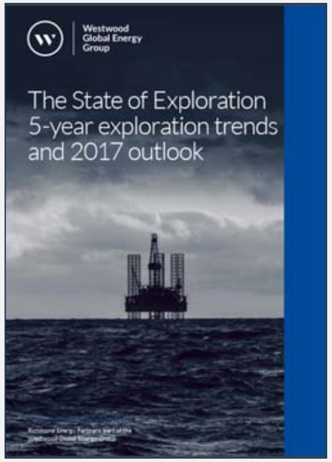
WGE Research Publications

In-depth research covering the global oilfield services and exploration markets

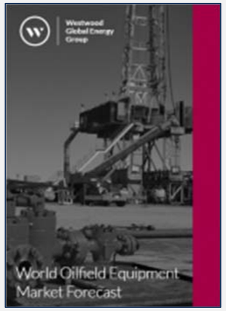
Westwood Global Energy Group

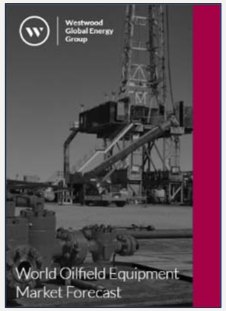
- Westwood offers a **dynamic** and constantly updated range of **in-depth** special reports, forecasts and market briefing services covering the **global** oilfield services and exploration markets.
- The coverage within these **60+ report** services is designed specifically to help our global energy customers make better, **well-informed** commercial and strategic decisions.
- Behind every report is a team of **dedicated professionals** at your disposal working to gather and deliver information to you as it happens.

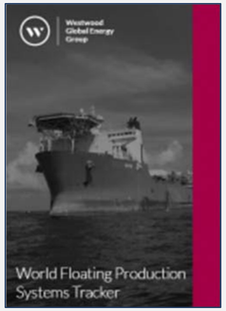
E&P

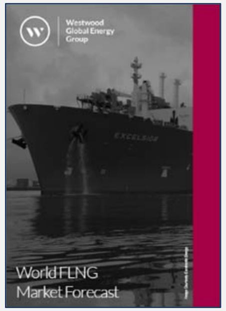


Oilfield Services









Sample of the 60+ report titles covers across the Westwood Group

WGE The Consulting Proposition

Westwood Global Energy Group

Our experienced consulting teams work with blue-chips across the energy chain; supported by world-class, in-house research

Service Line	Core Competencies – OFS	Core Competencies – E&P
Energy Analytics *Independent analysis and provision of insights on key macroeconomic, asset, market, commercial, regulatory and technological trends in conjunction with detailed forecasting*	✓ Macroeconomic scenario analysis ✓ Competitive landscaping ✓ Market sizing and projections ✓ Supply & Demand analysis ✓ Supply chain analysis ✓ Technology and regulatory risk assessment ✓ Regional and portfolio screening	✓ Activity trends and deal flows ✓ Competitive landscaping ✓ E&A performance benchmarking ✓ Economic modelling ✓ Finding and development costs analysis and benchmarking ✓ Historic and projected production levels ✓ Infrastructure analysis ✓ Regional and portfolio asset screening
Corporate Strategic Advisory *Independent analysis and assessment of corporate business strategies and commercial positioning in a dynamic commodity price environment*	✓ Business as usual (BAU) diagnosis ✓ Business Planning ✓ Corporate performance review ✓ Competitor benchmarking ✓ DNA assessment ✓ Growth initiatives, organic and inorganic ✓ Implementation strategy ✓ Strategic intervention	✓ E&P asset evaluation ✓ Basin entry & growth strategy ✓ Business as usual (BAU) diagnosis ✓ Corporate performance review ✓ Competitor benchmarking ✓ Exploration strategy and portfolio management ✓ Growth initiatives, organic and inorganic ✓ Farm-in / farm-out screening & strategy

WGE The Consulting Proposition (cont'd)

Our experienced consulting teams work with blue-chips across the energy chain; supported by world-class, in-house research

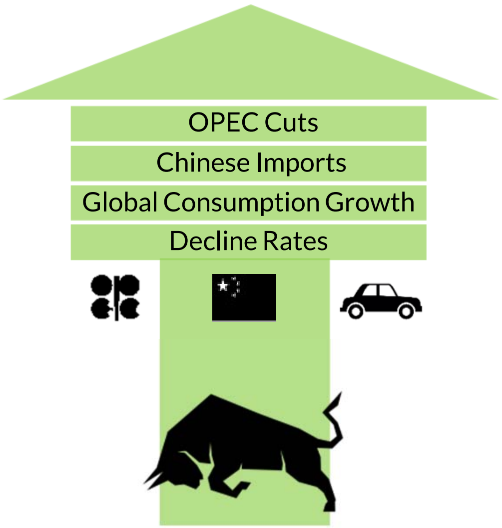
Westwood Global Energy Group

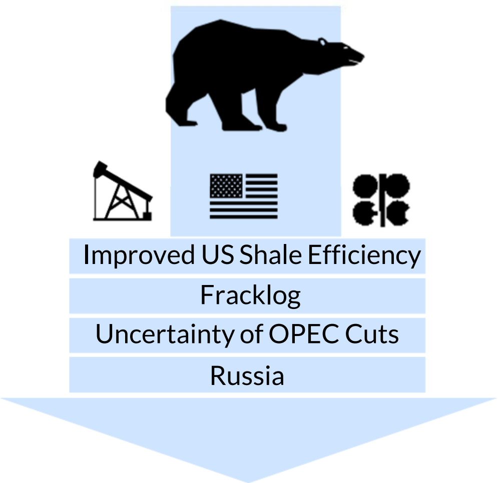
Service Line	Core Competencies – OFS	Core Competencies – E&P
Transaction Support *Independent analysis of assets, businesses, underlying markets and drivers to help develop and support investment / financing decisions*	✓ Debt financing and refinancing support ✓ Financial restructuring support ✓ Indicative asset valuations ✓ IPO and secondary equity financing support ✓ M&A commercial due-diligence ✓ Project financing support	✓ **UPSTREAM** ✓ Acquisition Scouting ✓ Corporate and Asset Acquisition support ✓ Indicative E&P asset valuations ✓ Resources and Reserves Assessment ✓ Technical and commercial due diligence ✓ **MIDSTREAM** ✓ Data room management ✓ Future volume projections / evaluation ✓ Infrastructure & Hub Analysis, capacity, throughput & longevity ✓ Surface facility Engineering (DNV-GL)
Government Services *Independent analysis and provision of insights and recommendations to government agencies and industry bodies to help shape energy industry-specific policies*	✓ Industry roadmap ✓ Long term energy scenario planning ✓ Market workshops ✓ Project finance ✓ Regional hub benchmarking ✓ SME stimulation	

02 Macro-Economic Energy Outlook

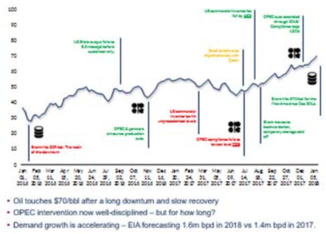
WGE Macroeconomic Outlook

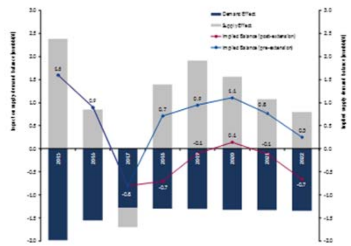
It's all about OPEC!

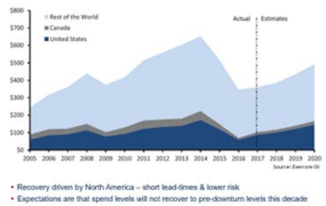




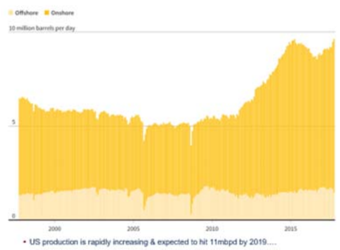
- Current recovery hinges entirely on OPEC… for now

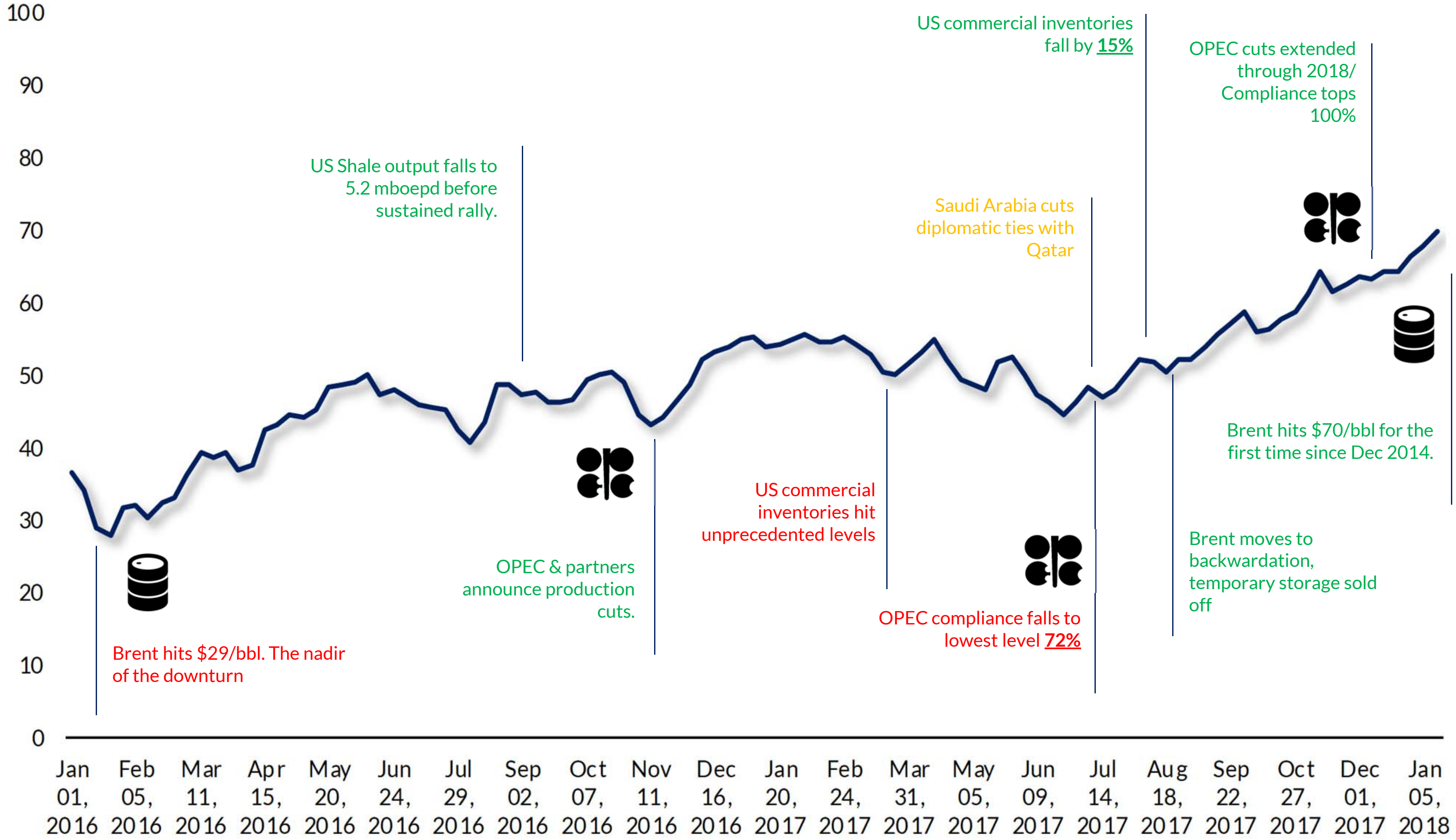






- Huge supply-side uncertainties & wildcards remain

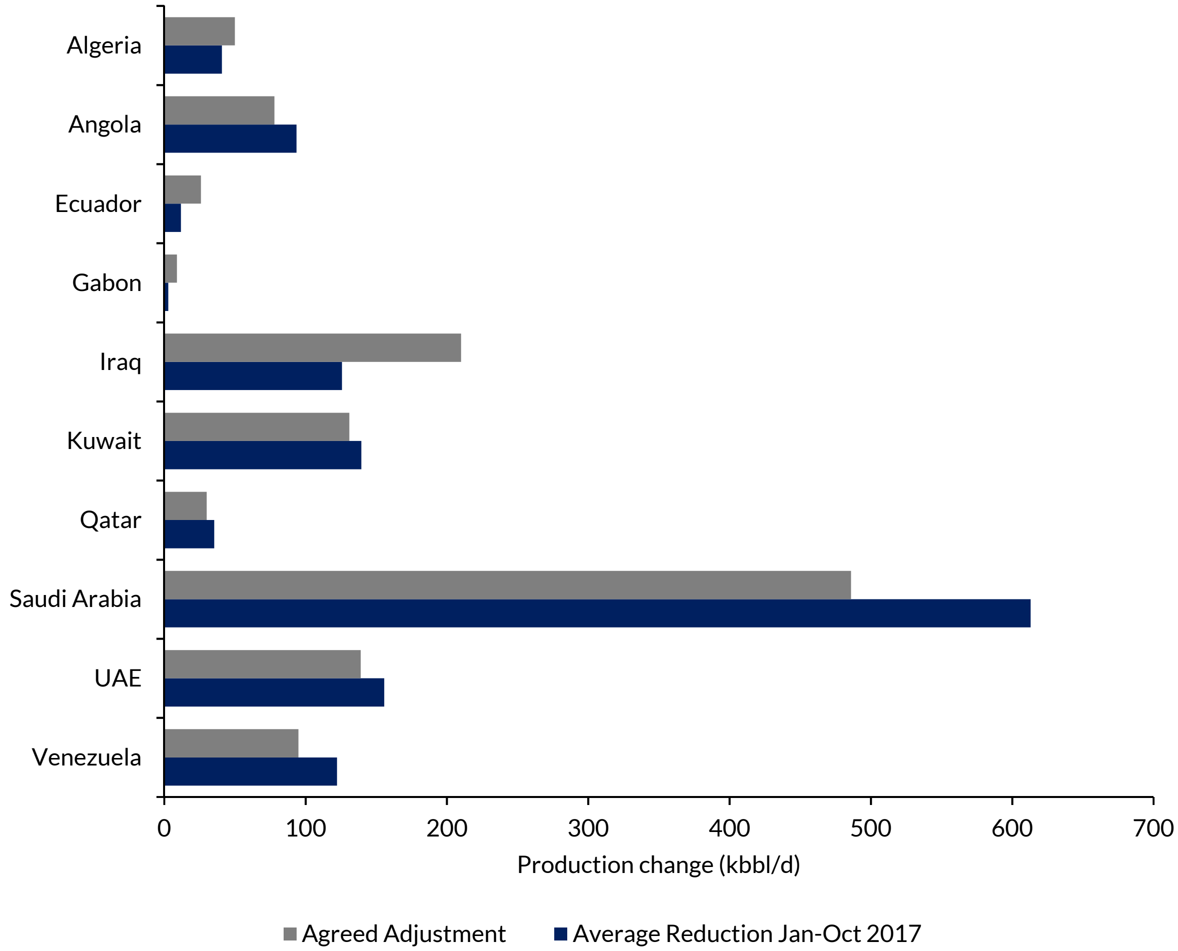




- Oil touches $70/bbl after a long downturn and slow recovery
- OPEC intervention now well-disciplined – but for how long?
- Demand growth is accelerating – EIA forecasting 1.6m bpd in 2018 vs 1.4m bpd in 2017.

Westwood Global Energy Group Macro-Economic Outlook

OPEC members display increasing discipline through 2017

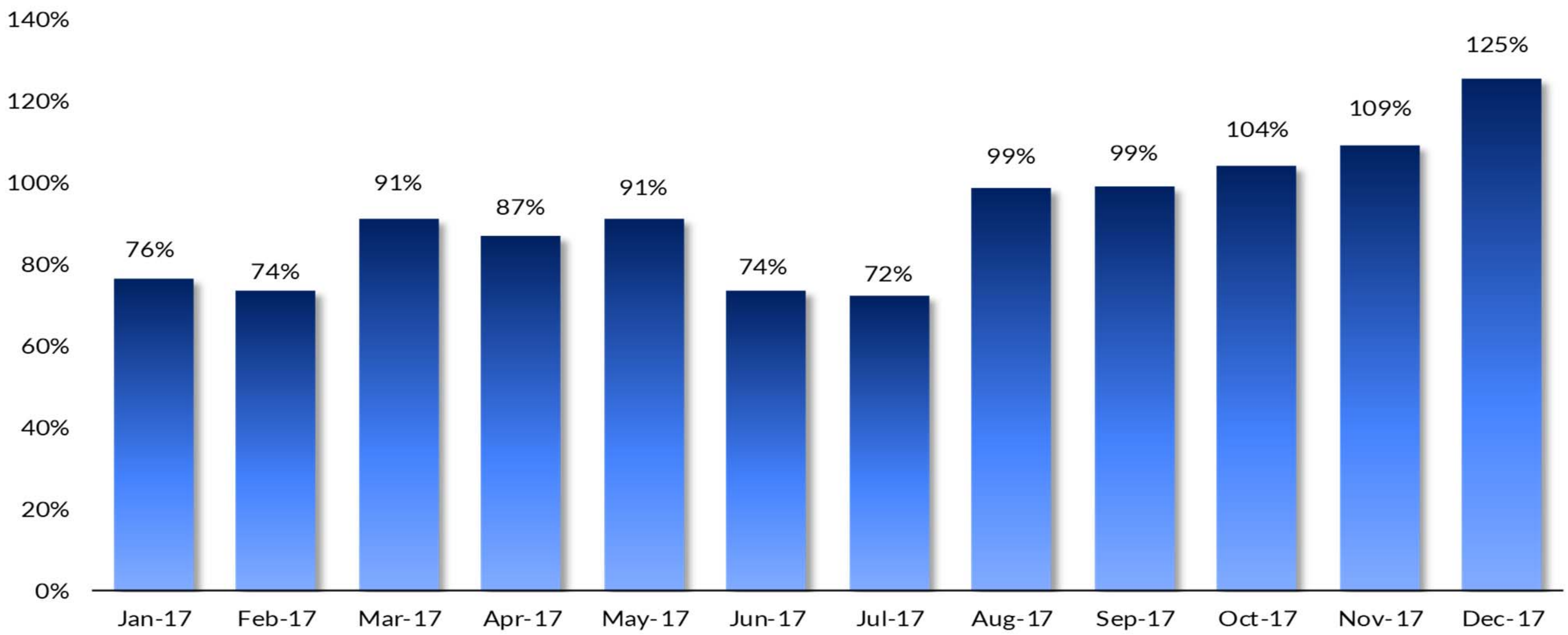


OPEC 2017 Production Reduction vs Agreed Reduction

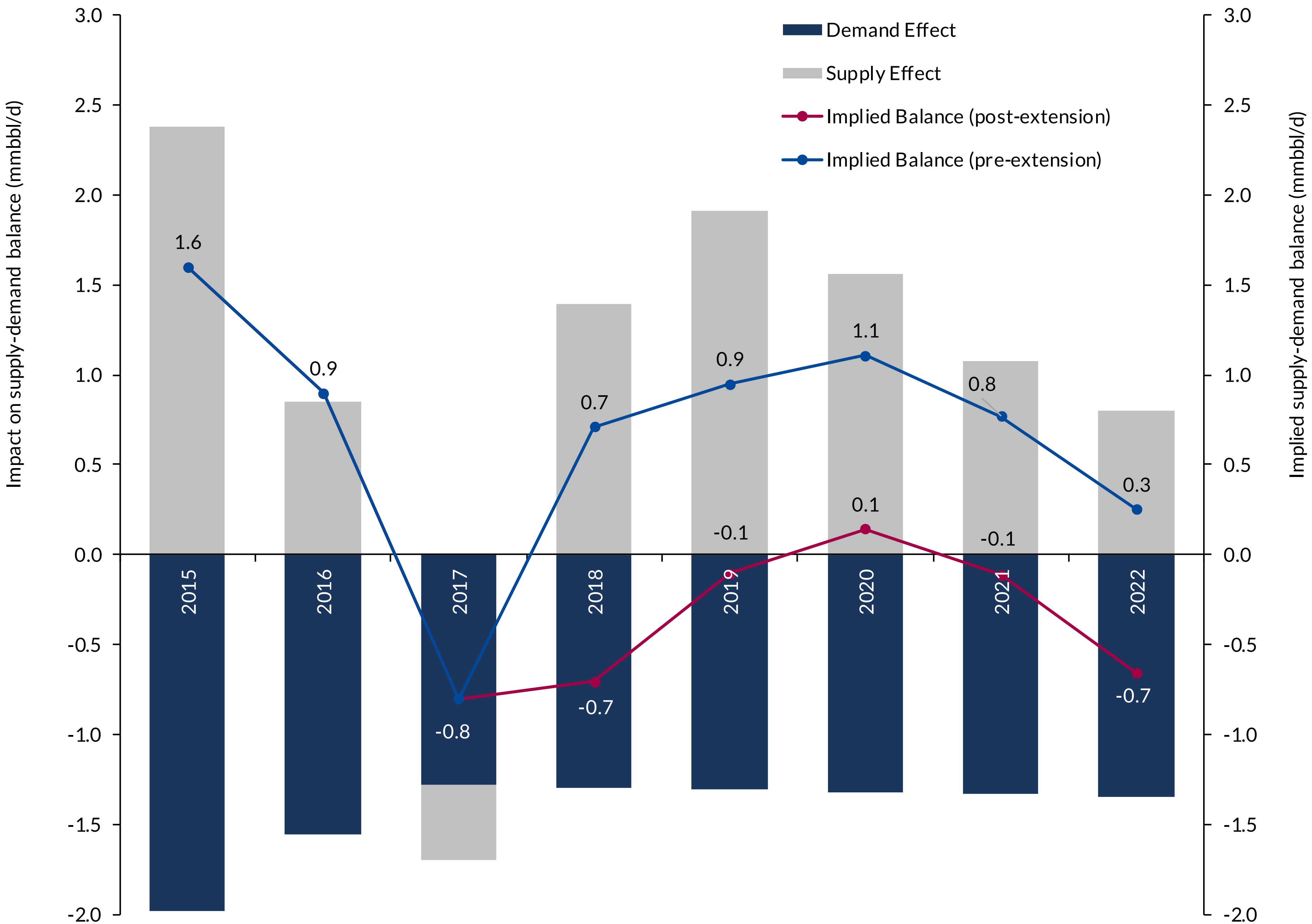
- 1.2 mmbbl/d cut agreed between ten OPEC members 12 months ago
- Saudi Arabia with largest share of the cut (-486 kbbl/d)
- -558 kbbl/d from 11 non-OPEC nations
- Saudi Arabia have gone beyond agreed adjustment to compensate for non-compliance of OPEC and non-OPEC nations
- Cuts extended in May to March 2018, again in November to end of 2018
- Libya and Nigeria now restricted to 2017 levels, previously exempt

WGE Macro-Economic Outlook

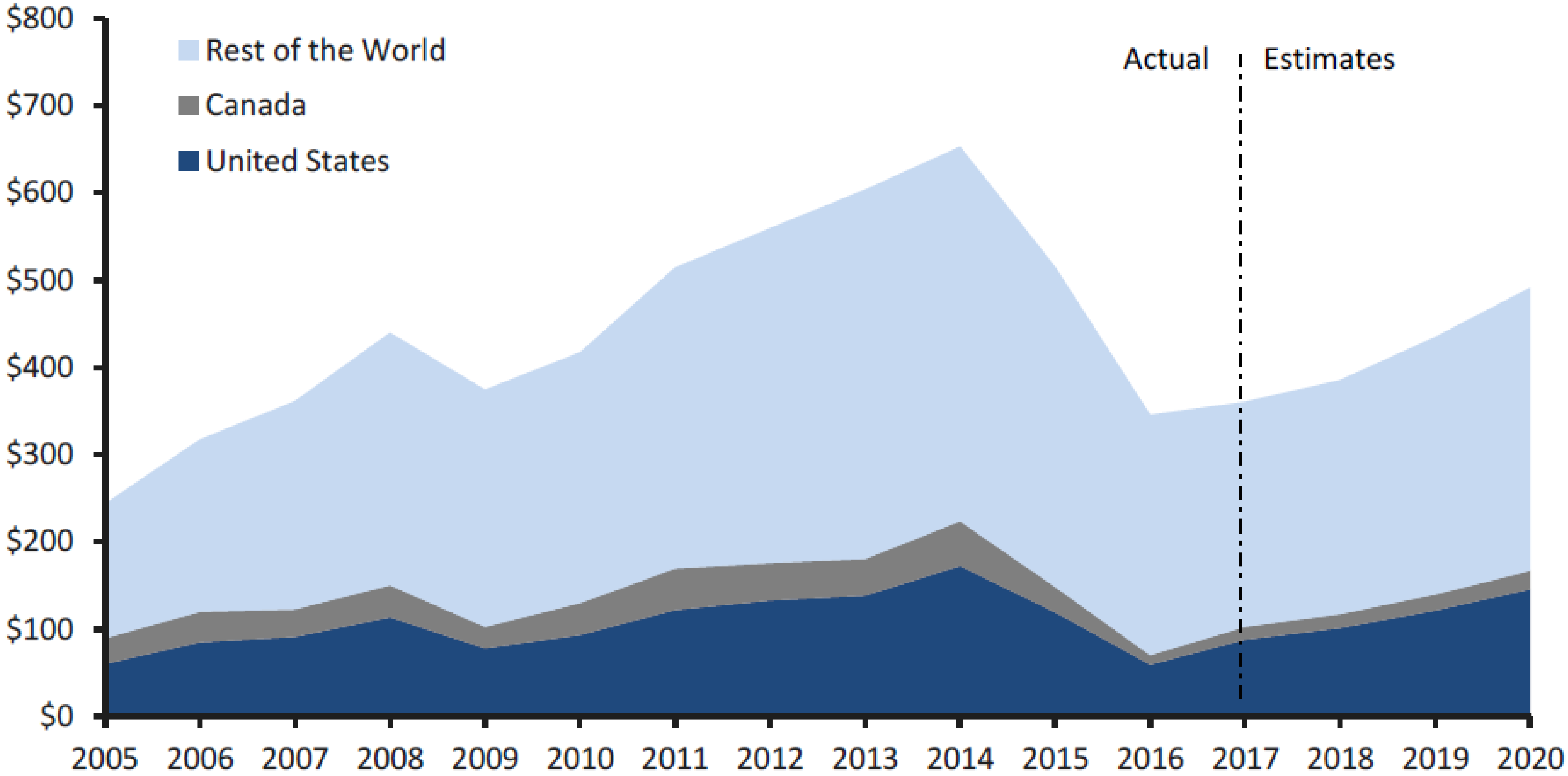
OPEC members display increasing discipline through 2017



- Saudi Arabia, Venezuela and Mexico have driven OPEC cuts compliance to 125%
- Saudi Aramco reportedly continuing to progress IPO plans to float 5% in 2018
- Russia reportedly mulling OPEC deal exit?

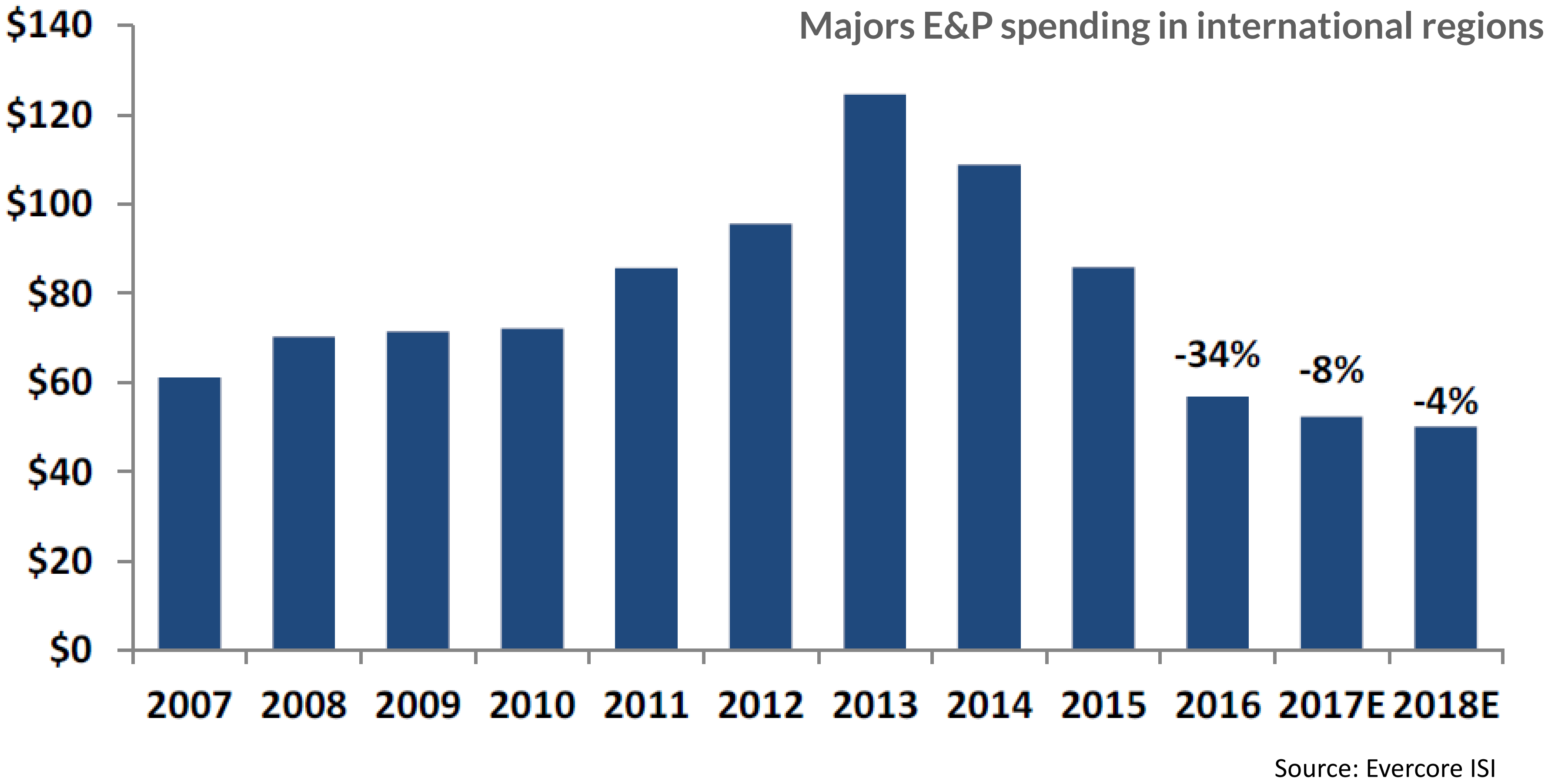


Demand Effect
Supply Effect
Implied Balance (post-extension)
Implied Balance (pre-extension)
Impact on supply-demand balance (mmbbl/d)
Implied supply-demand balance (mmbbl/d)
3.0
2.5
2.0
1.5
1.0
0.5
0.0
-0.5
-1.0
-1.5
-2.0
2015
2016
2017
2018
2019
2020
2021
2022
1.6
0.9
-0.8
0.7
-0.7
0.9
-0.1
1.1
0.1
0.8
-0.1
0.3
-0.7

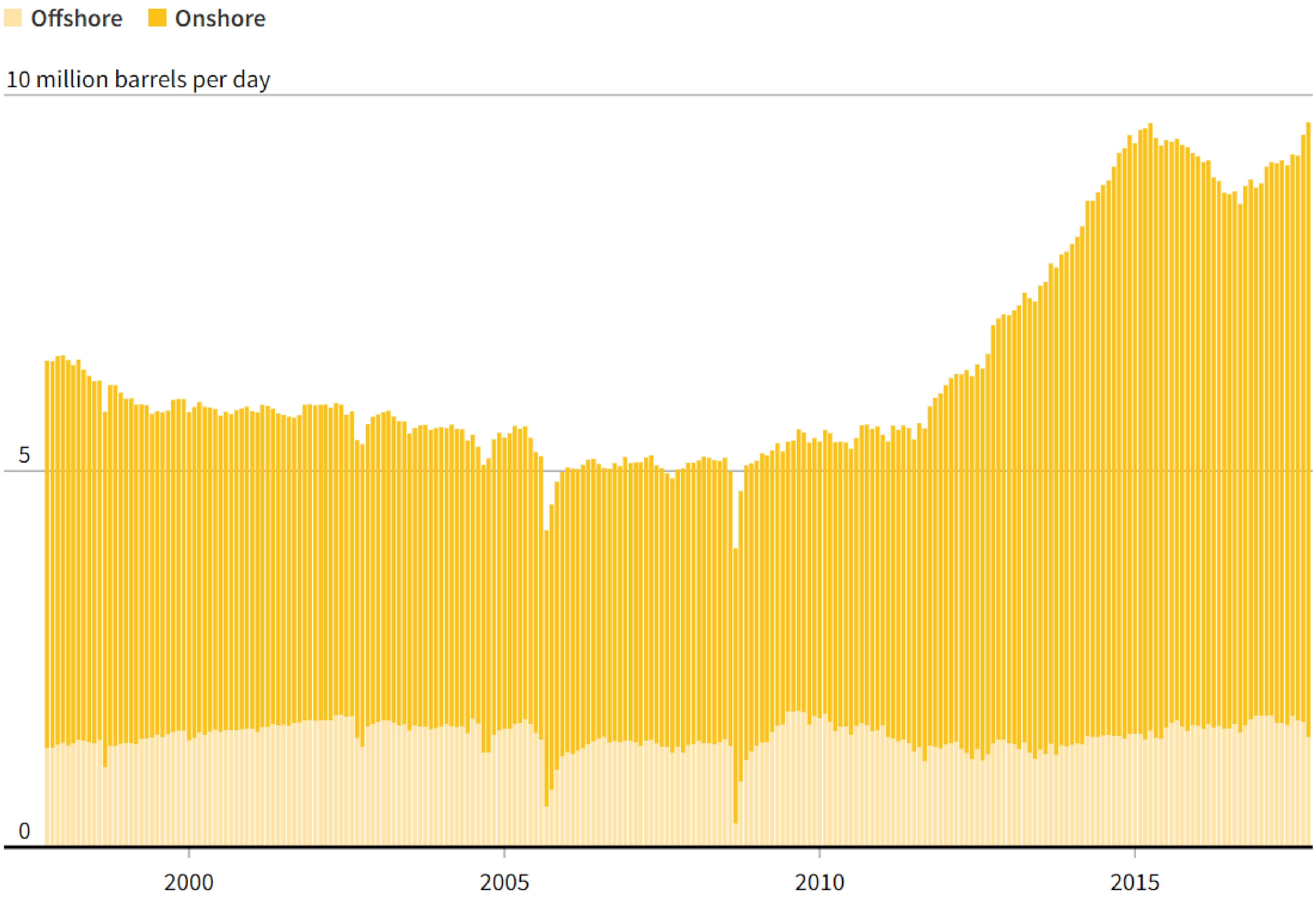


Source: Evercore ISI

- Recovery driven by North America – short lead-times & lower risk
- Expectations are that spend levels will not recover to pre-downturn levels this decade

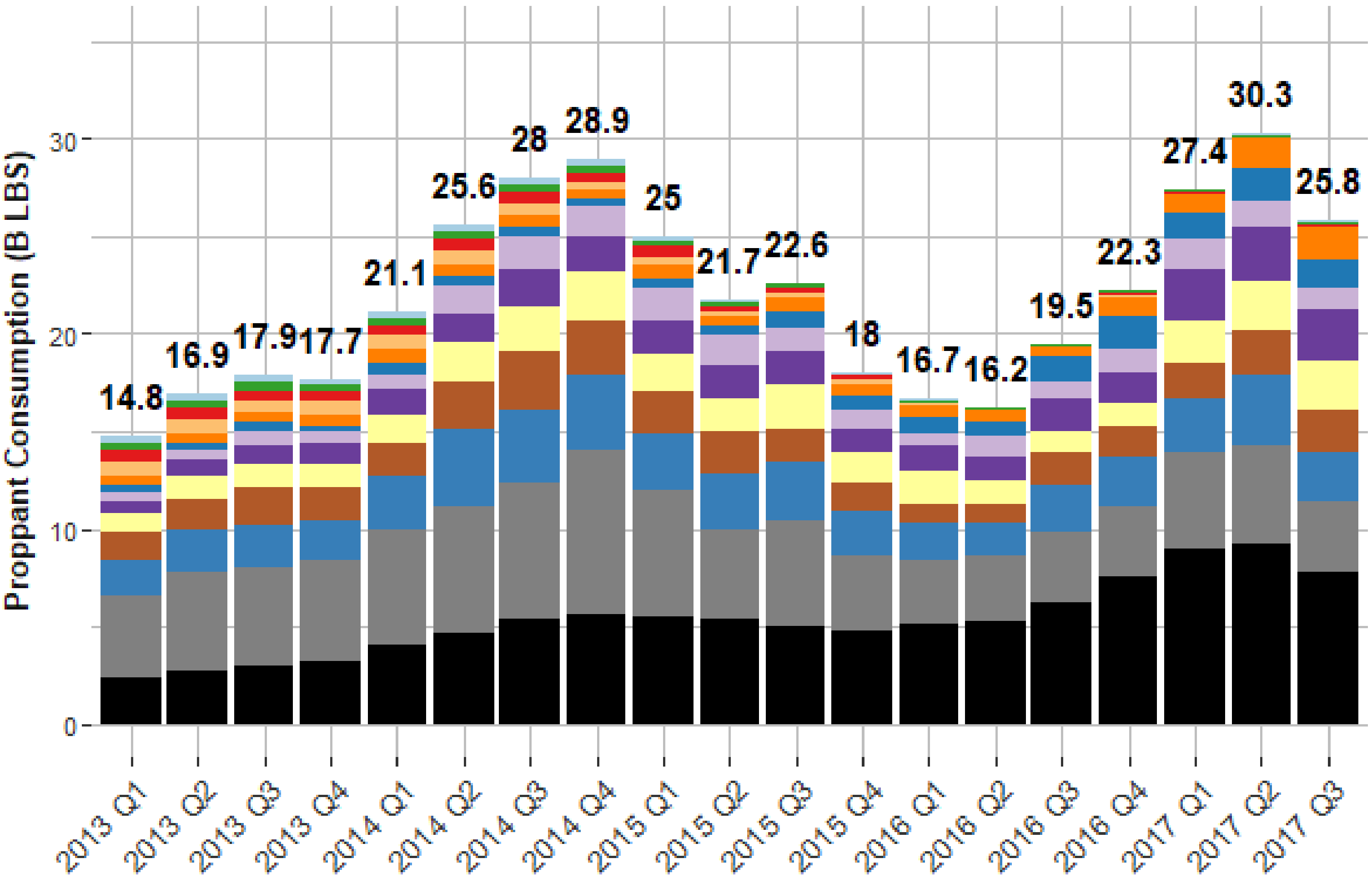


- Major E&P cos continue to focus on capital discipline – overall Capex and cost/bbl extracted remain important performance indictors
- Over 40% reduction in average cost/bbl extracted for developments sanctioned 2014 vs 2016 onshore US.

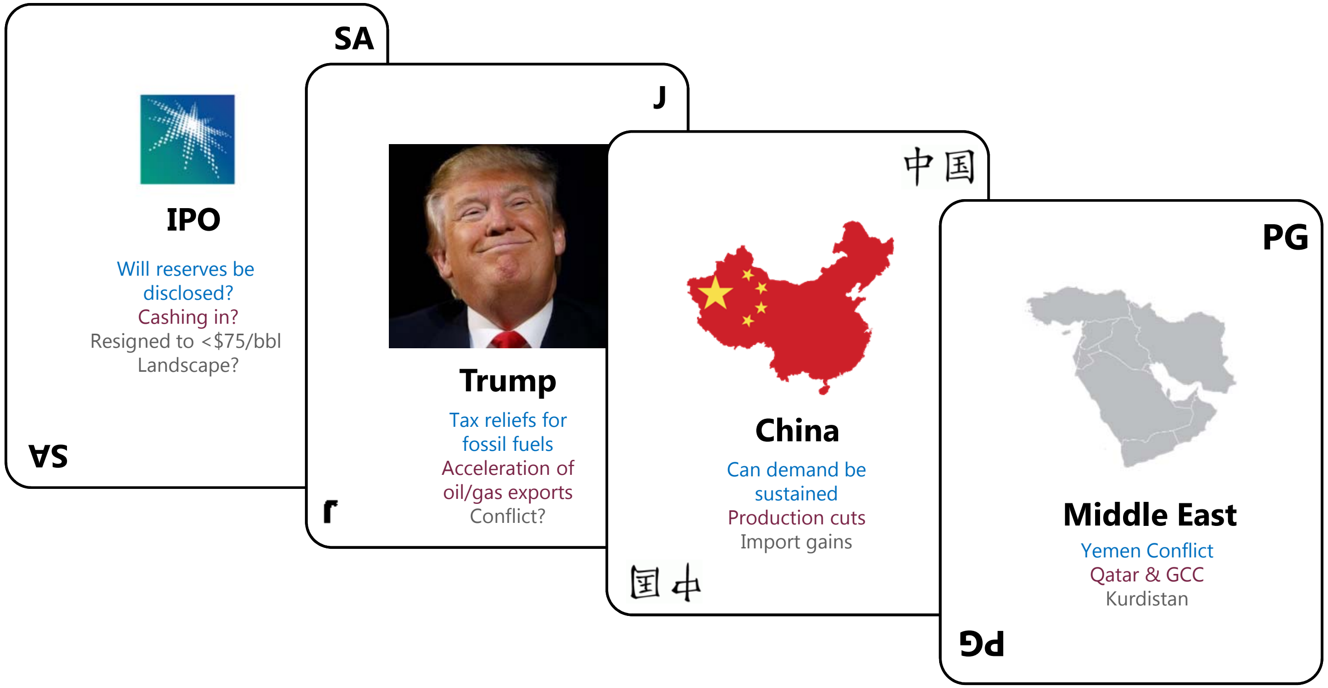


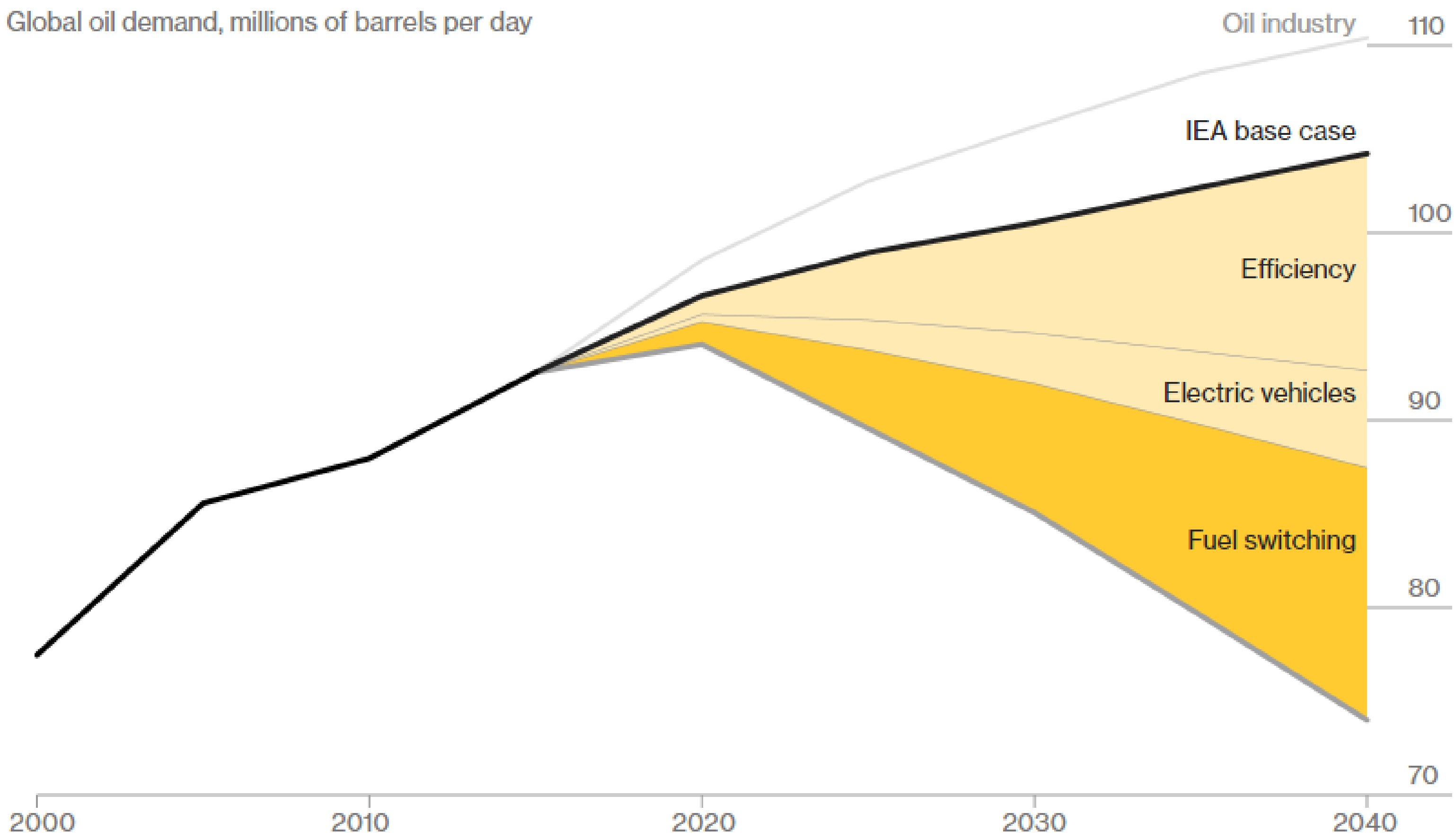
- US production is rapidly increasing & expected to hit 11mbpd by 2019….

U.S. Quarterly Proppant Consumption



- ….driven by an increase in shale production & associated technology
- Shale supply-chain now in overdrive & inventory of uncompleted wells hits new highs as frac utilisation and sand consumption soar


SA
IPO
Will reserves be disclosed?
Cashing in?
Resigned to <$75/bbl
Landscape?
J
Trump
Tax reliefs for fossil fuels
Acceleration of oil/gas exports
Conflict?
中国
China
Can demand be sustained
Production cuts
Import gains
PG
Middle East
Yemen Conflict
Qatar & GCC
Kurdistan



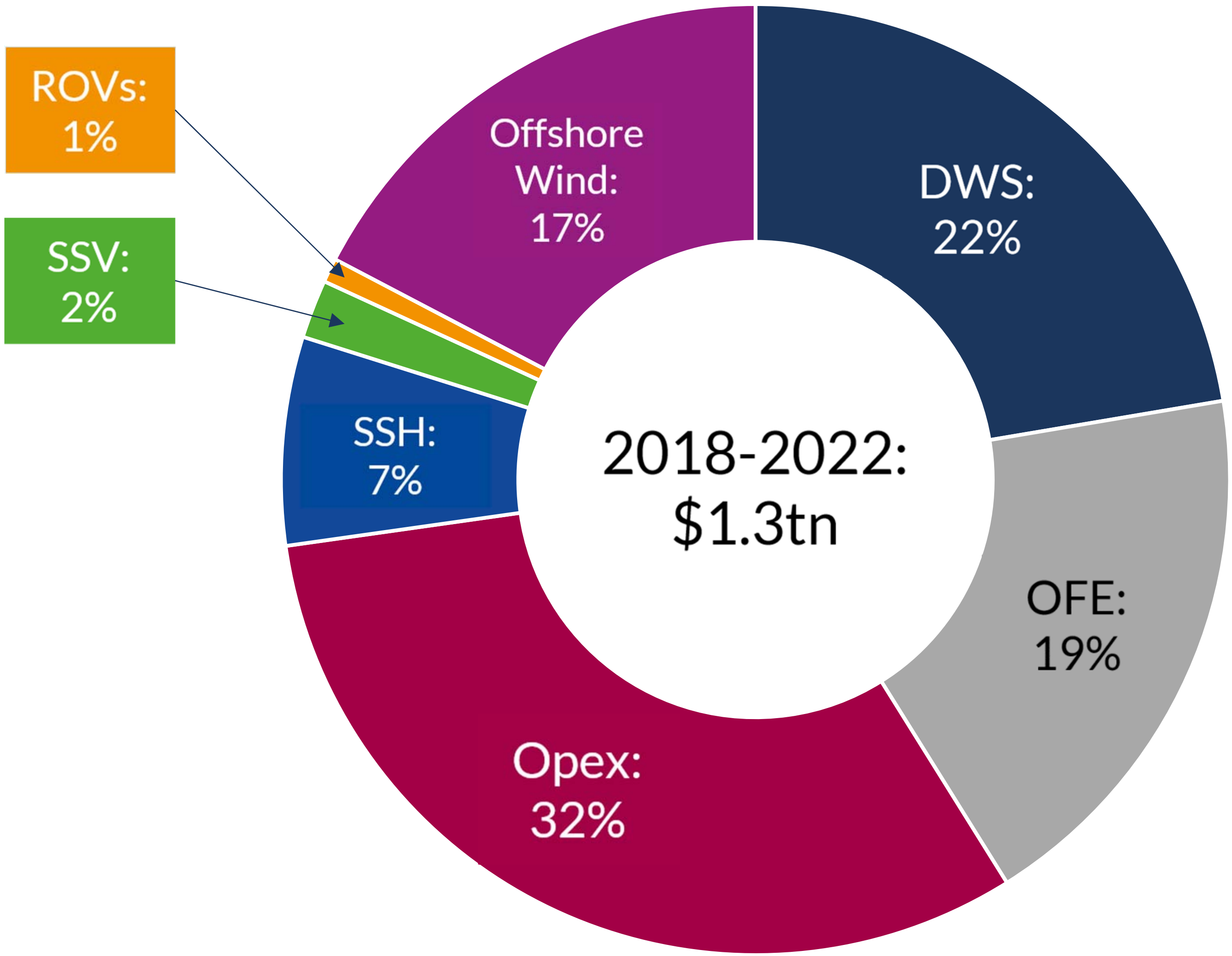
Oil Demand Outlook - IEA/Bloomberg, May 31, 2017

- Oil industry forecasting continued growth in demand which, along with production decline from existing fields paints a positive view for the need for offshore field development.
- However, other views exist and could have material impact on future oil development in difficult-to-access (i.e. high cost) areas.

03 Offshore Sector Forecasts & Leading Indicators

WGE Offshore Sector Forecasts & Leading Indicators

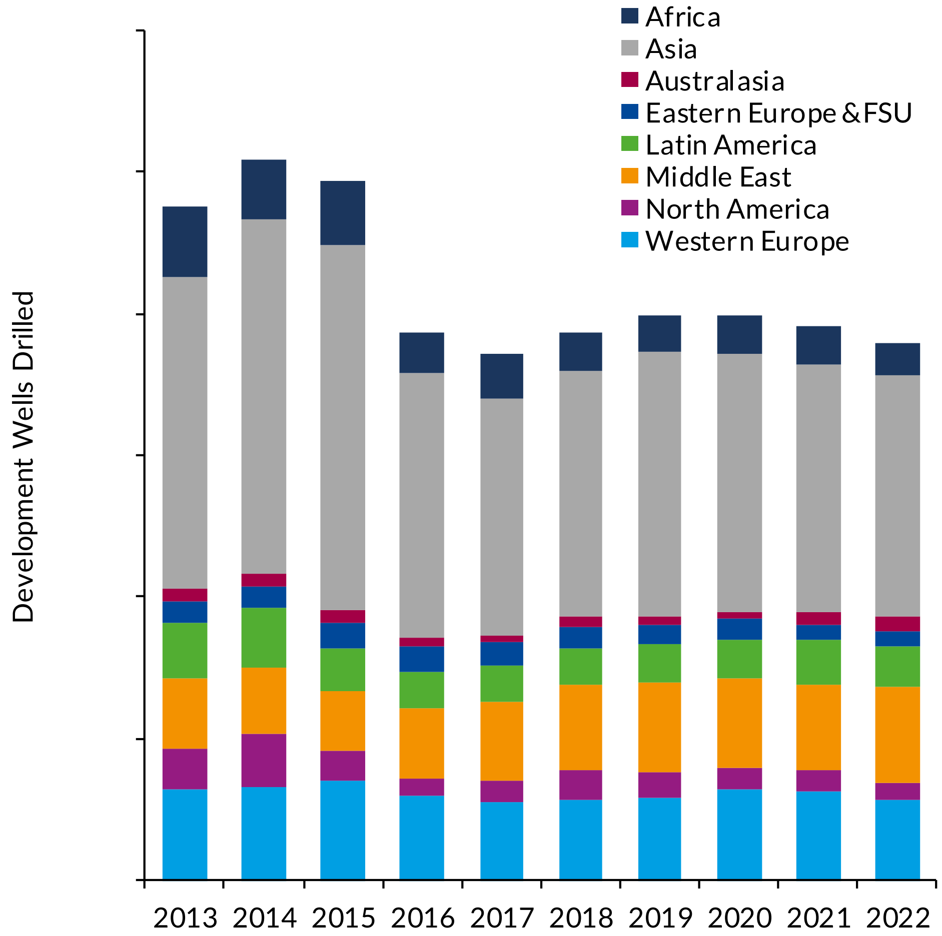
Total spend of c.$1.3tn expected over 2018-2022.



Global Offshore Prospects

WGE Offshore Drilling

Flat outlook for offshore wells drilled

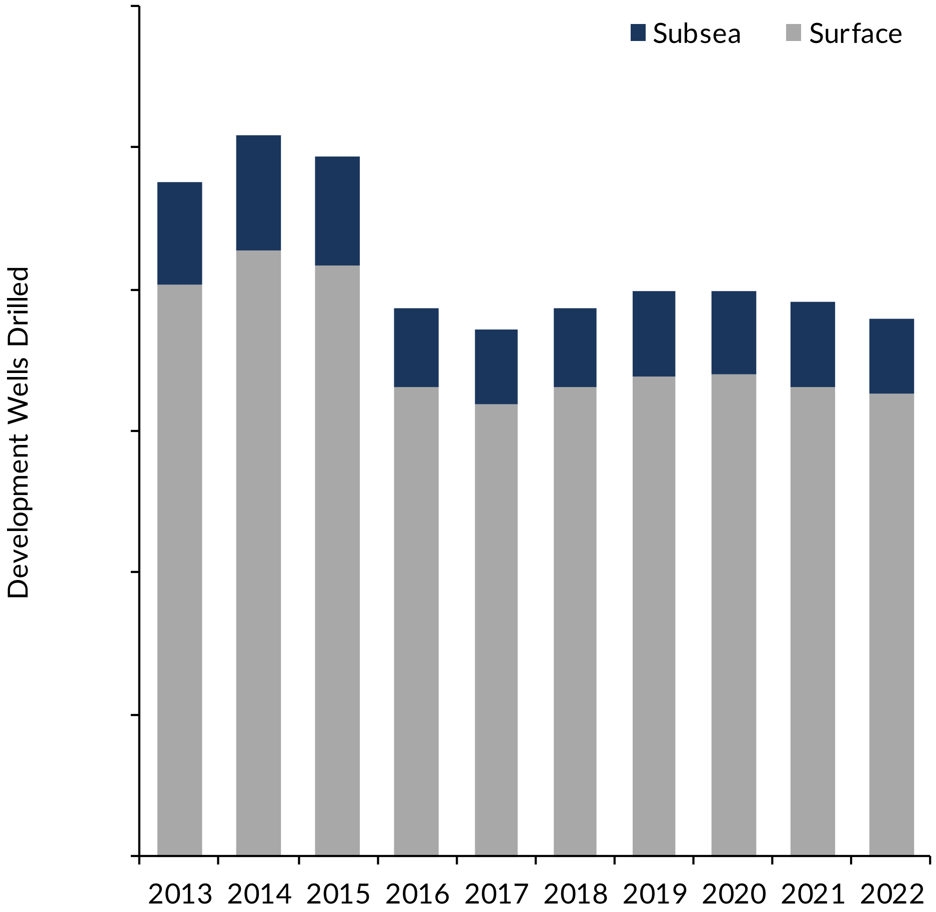


Offshore Development Wells Drilled by Region

- 27% decline over 2014-2017
- Asia 45% of forecast well spuds
- Western Europe to peak in 2020
- More positive 2018 & 2019
- Long-term issues of lack of sanctioning

WGE Offshore Drilling

Surface drilling will remain dominant



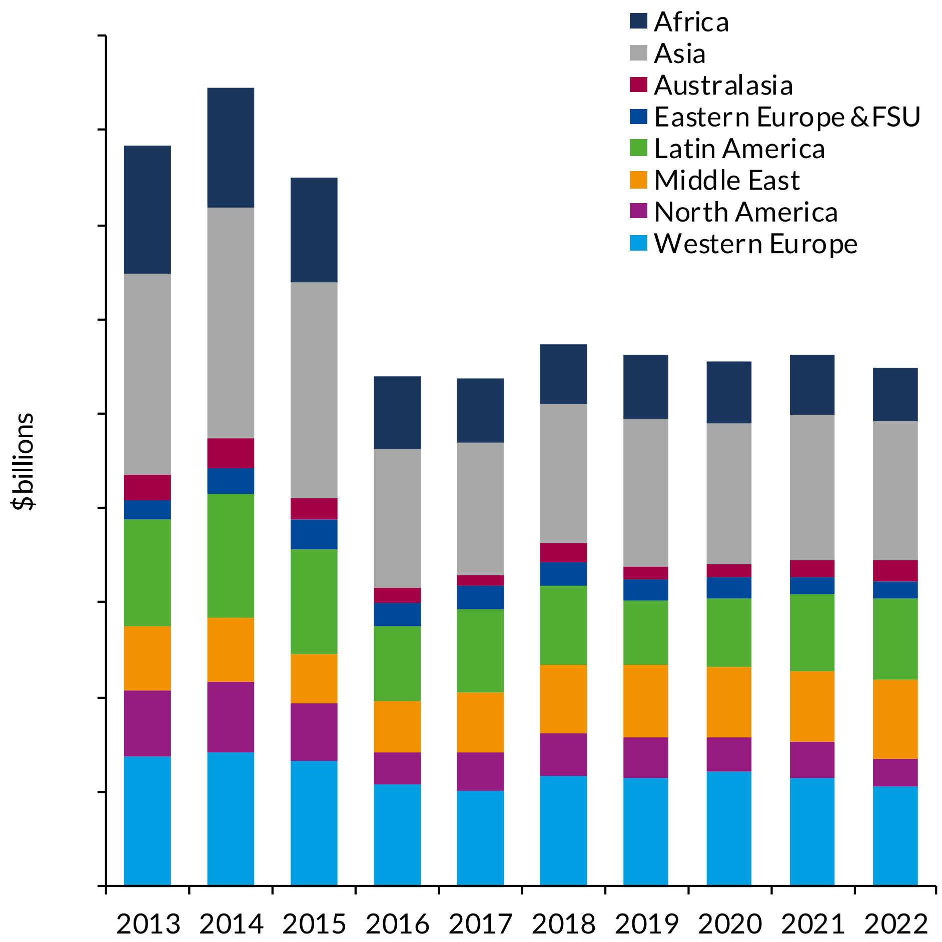
Offshore Development Wells Drilled by Tree Location

- Surface wells 85% of forecast
- 1,449 visible subsea tree installations to 2022
- Subsea drilling to peak in 2021

WGE Offshore Drilling & Wells Services

Westwood Global Energy Group

Drilling & Well Services driven by drilling activity. Day rate deflation to remain.

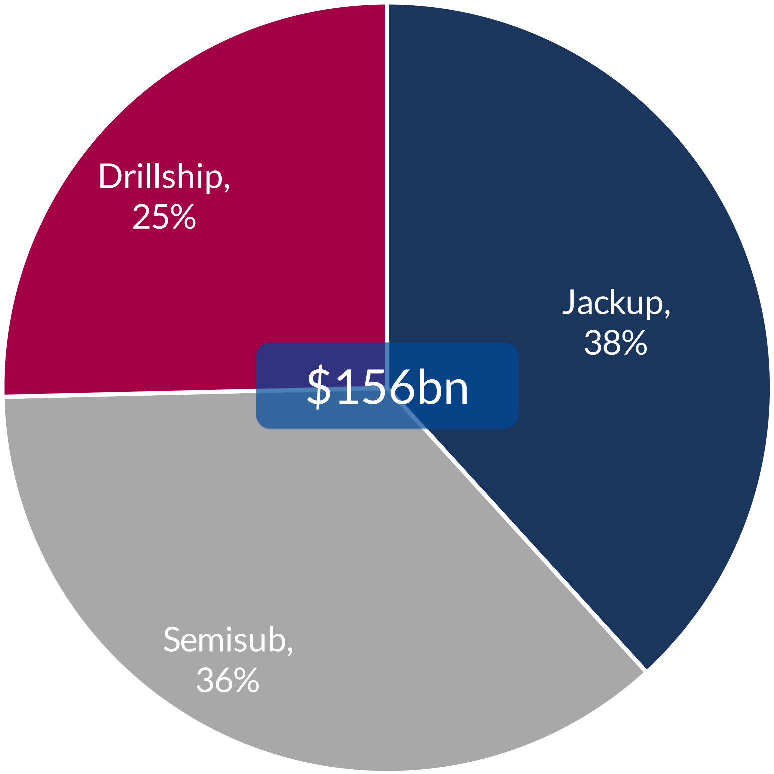


Offshore Drilling & Well Services Expenditure by Region

- $280bn market over the forecast
- Uplift in 2018 due to rise in drilling
- Return to decline in 2019 and beyond
- Rig utilisation will remain low

WGE Offshore Drilling & Wells Services

Rig & Crew is the largest offshore Drilling & Well Services market. Will total $156bn over 2018-2022.



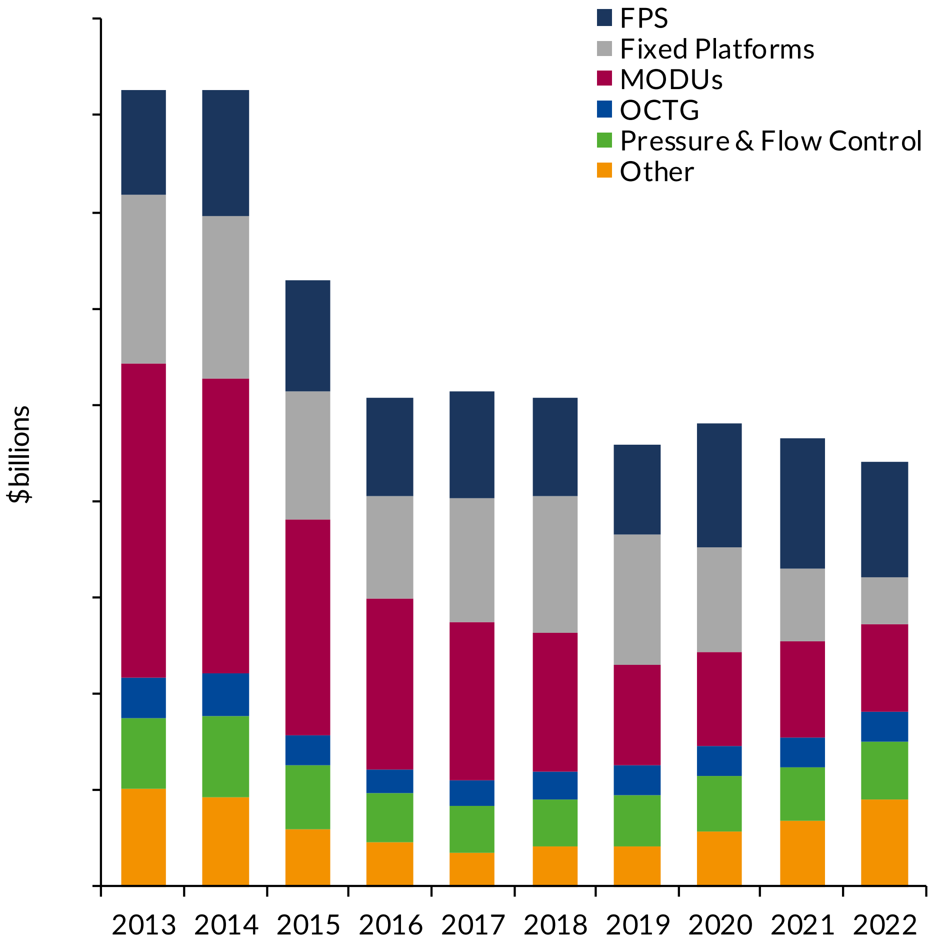
Offshore Rig & Crew Expenditure by Rig Type

- Rig & crew accounts for 56% of total
- 37% decline since 2014
- Jackups largest portion of spend
- Drillships have been hardest hit
- Struggles likely to continue

WGE Offshore Oilfield Equipment

Westwood Global Energy Group

Offshore Oilfield Equipment market shows one of the poorest growth prospects in WGE market coverage.



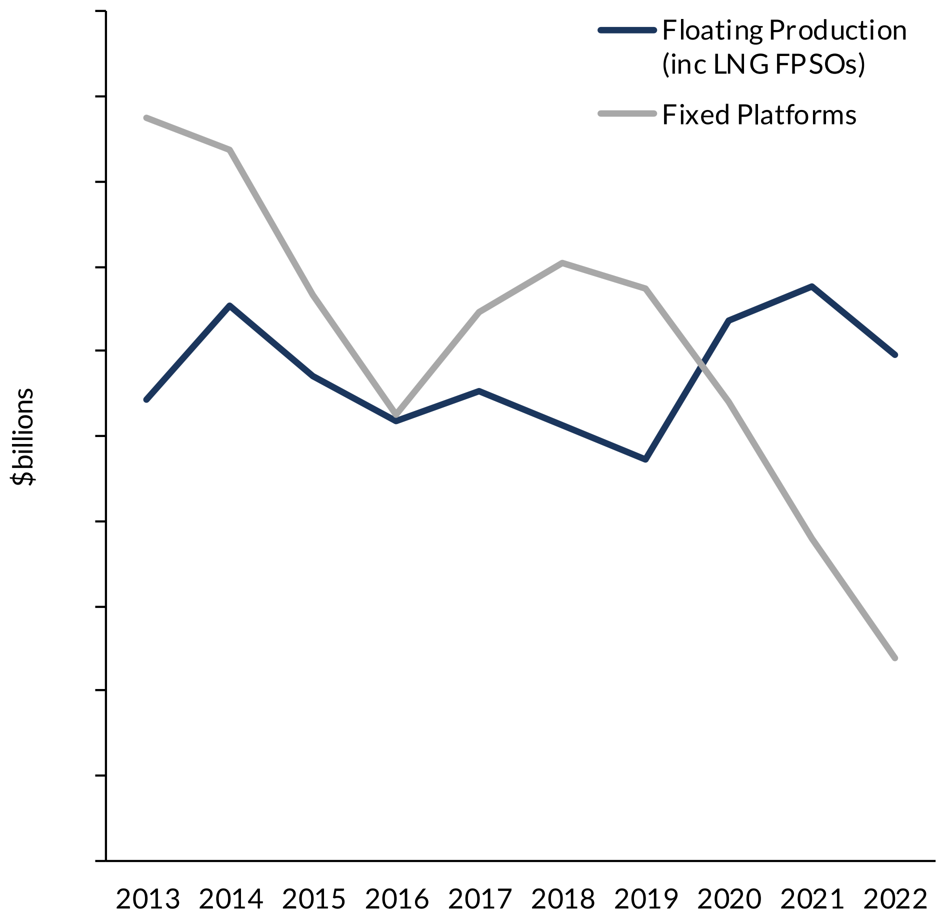
Offshore Oilfield Equipment Expenditure by Equipment Category

- $235bn market over next 5 years
- Expenditure phased from order to delivery year
- Fixed platforms and MODUs have worst outlook
- FPS flat near-term; gaining long-term

WGE Offshore Oilfield Equipment

Westwood Global Energy Group

Fixed and Floating Production product line to total $108bn over 2018-2022

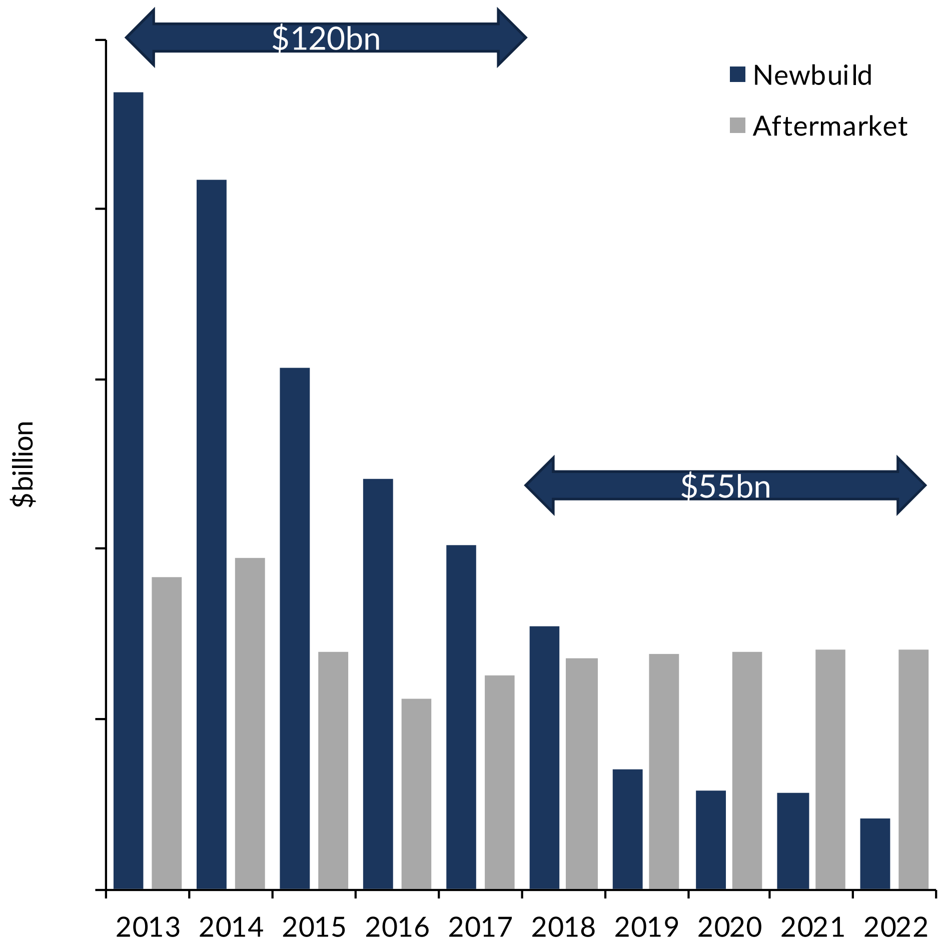


Offshore Fixed & Floating Production Expenditure by Asset Type

- 46% of total OFE spend
- Fixed platform improved, but long-term issues
- FPS more stable, delayed projects boosting long-term prospects

WGE Offshore Oilfield Equipment

Rig build boom in 2011-2013 has caused dramatic oversupply. Very few orders expected over next 5 years.

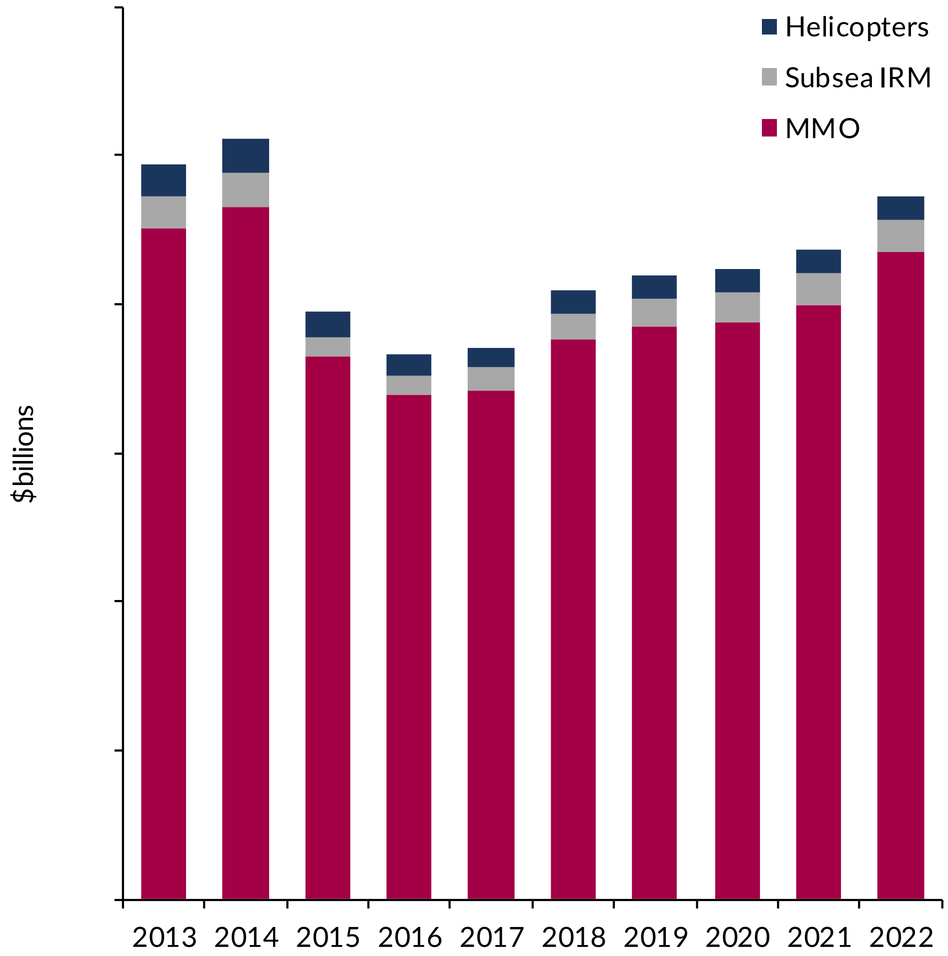


Offshore Rig Expenditure by Expenditure Type

- Very few orders since 2014
- Shipbuilding backlogs vastly reduced
- Minimal orders over forecast
- Aftermarket has been more buoyant

WGE Offshore Opex

Significant offshore Opex market. Operators have looked to make cutbacks where possible.

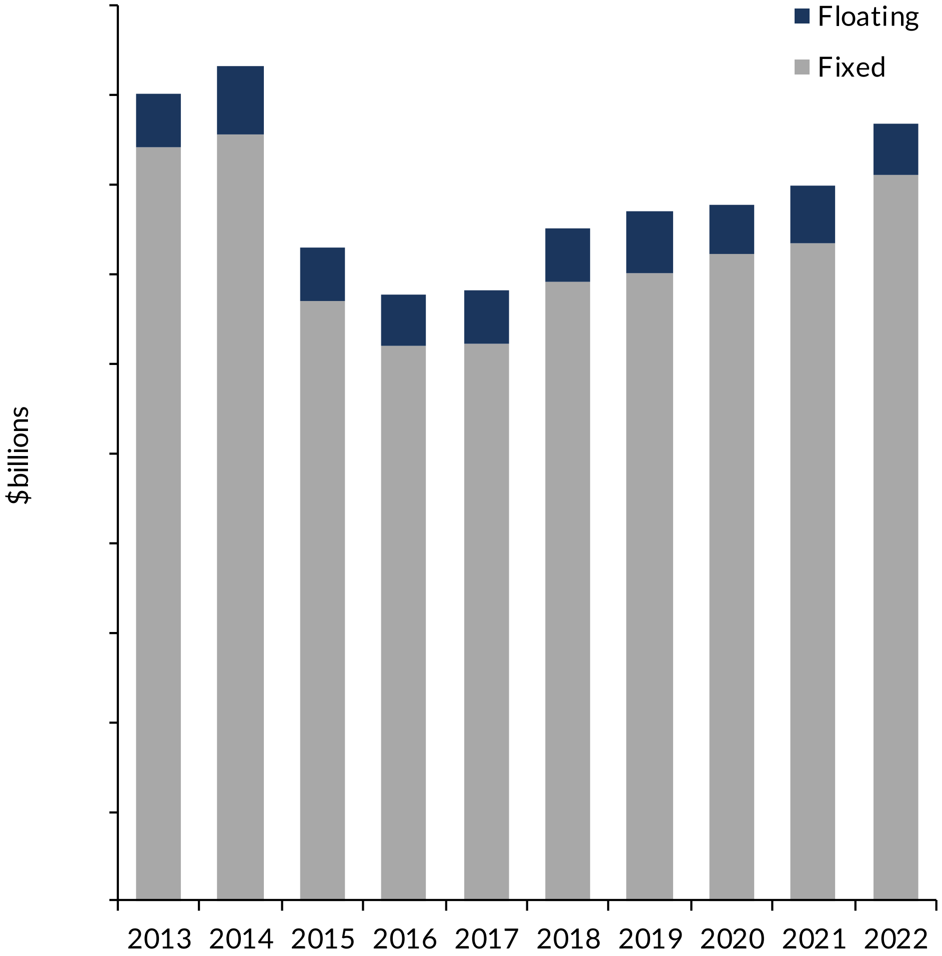


Offshore Operational Expenditure by Service Line

- $432bn market over 2018-2022
- Platform maintenance accounts for vast majority of this
- All Opex markets have seen cutbacks through the downturn
- Positive outlook from here

WGE Offshore Opex

Fixed and floating platform maintenance modifications and operations spend the largest portion of global Opex.

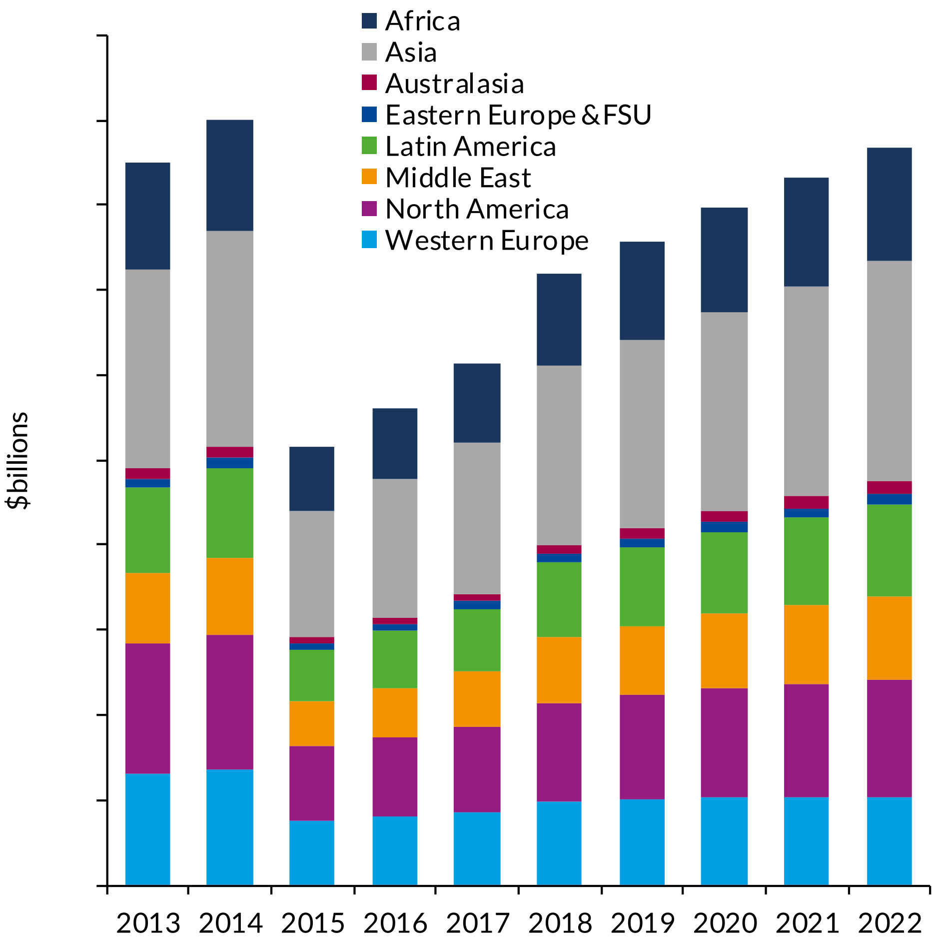


Offshore Maintenance, Modification and Operations Expenditure by Platform Type

- Fixed platform population is mature
- Total market over 2018-2022:
  - Fixed: $366bn
  - Floating: $30bn
- Delayed modifications spend boosting forecast

WGE Offshore Opex

Subsea inspection, repair and maintenance market is a much smaller market, but no less significant.

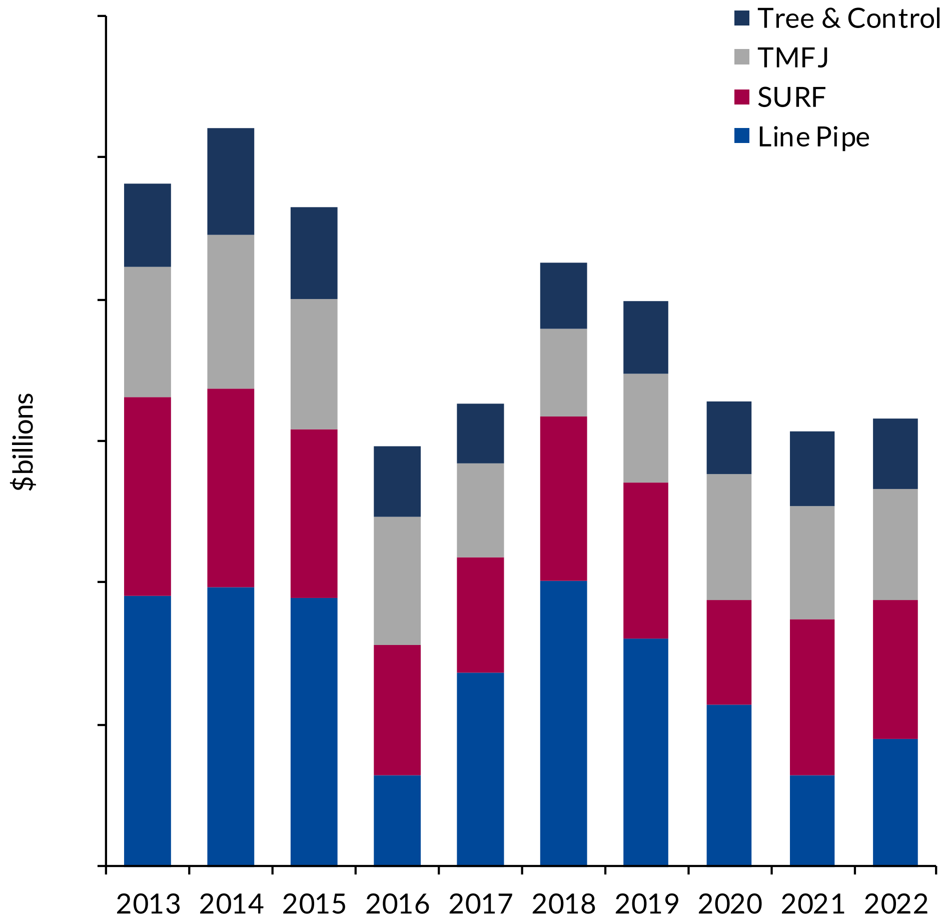


Subsea IRM by Region

- $20bn market over next 5 years
- Asia is the largest subsea IRM market
- Middle East to see strongest growth
- Western Europe to be flat

WGE Subsea Hardware

Subsea hardware market is improving. $89bn total market over 2018-2022.



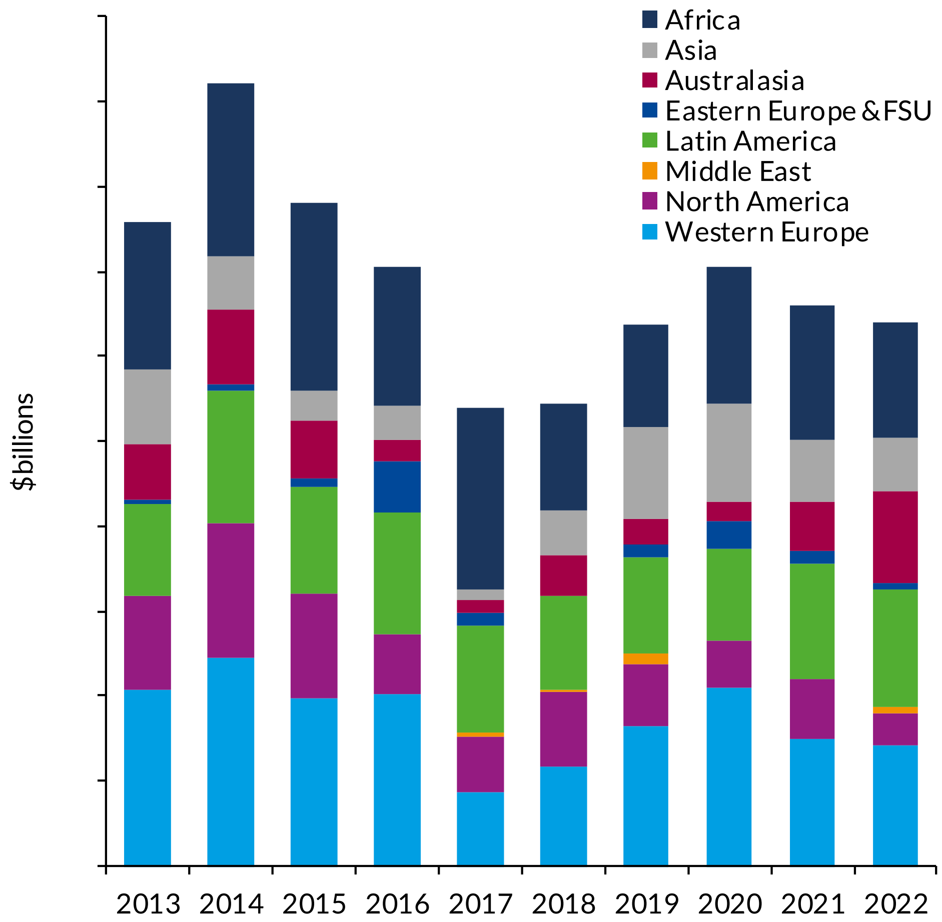
Subsea Hardware Expenditure by Hardware Type

- Driven by deepwater activity
- Line Pipe a key market, but "lumpy"
- Western Europe one of the biggest markets
- Tree installations key driver of SSH market

WGE Subsea Hardware

Westwood Global Energy Group

Subsea tree, control and template, manifold, flying lead and jumper

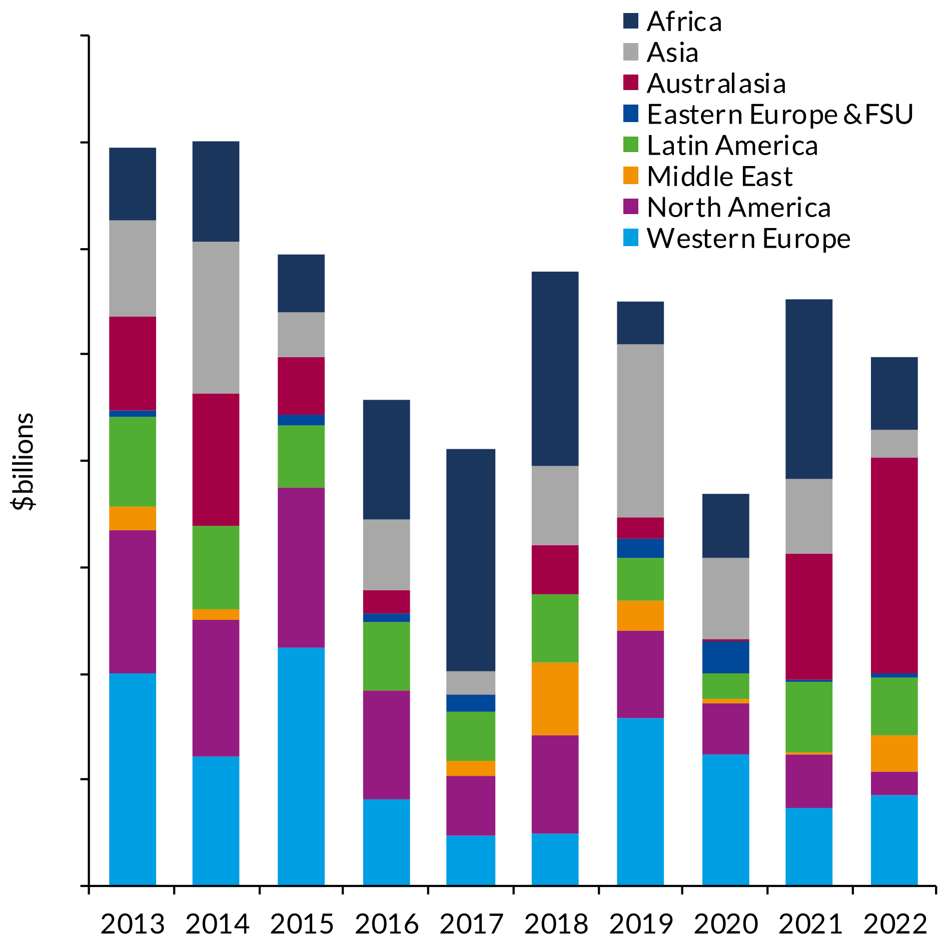


Subsea Tree & TMFJ Expenditure by Region

- $32bn market over next 5 years
- Templates and manifolds 43% of spend
- Subsea trees 22% of total
- UK & Norway to see 276 subsea tree installations

WGE Subsea Hardware

Subsea umbilicals, risers and flowlines market is 29% of future subsea hardware market.



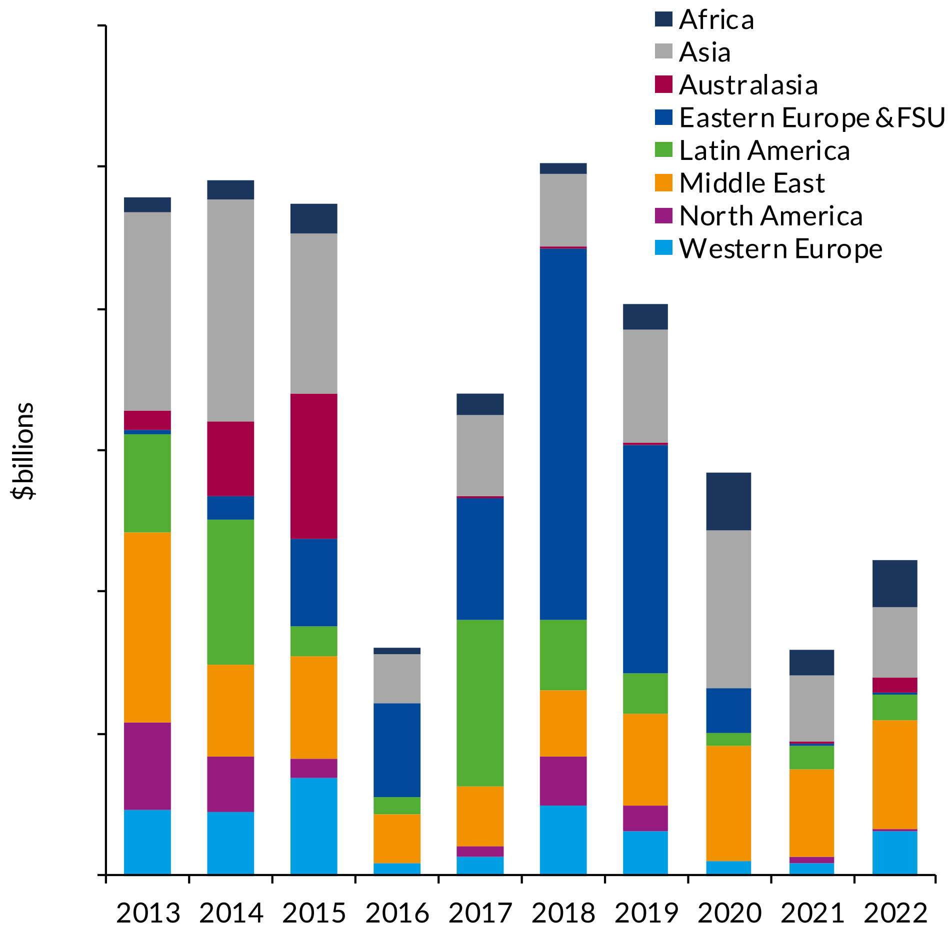
SURF Expenditure by Region

- 41% decline through downturn
- More ‘lumpy’ than TMFJ and xmas tree market
- 2017-2018 boosted by 1,410km in North Africa
- 2019 by India, Norway
- 2021-2022 by Australasia

WGE Subsea Hardware

Westwood Global Energy Group

Line pipe very dependent on a handful of high profile/Capex projects. Tends to be 'lumpy'.



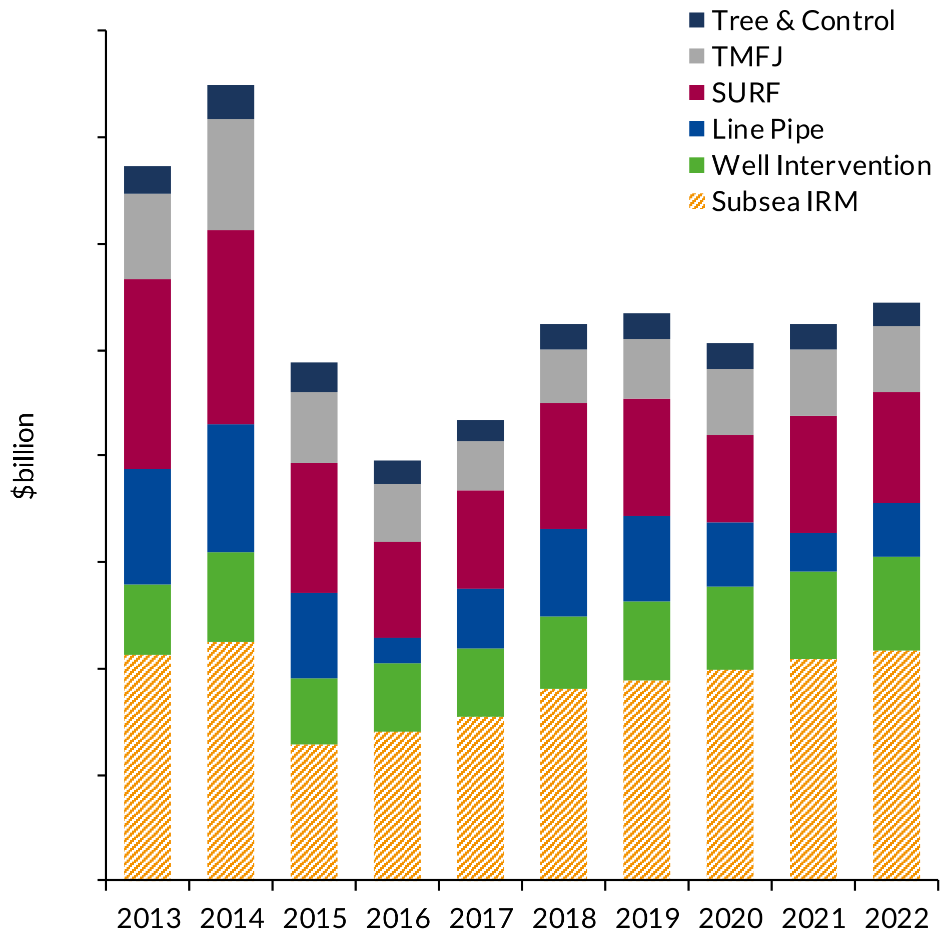
Offshore Line Pipe Expenditure by Region

- 35% of total SSH market
- EE&FSU 29% of forecast
- Turkstream & Nord Stream II
- 1,300km SAGE pipeline included in forecast but a risk
- ~250km for Bonga SW and Zabazaba

WGE Subsea Vessels

Westwood Global Energy Group

Reduction of E&P spend and an oversupplied vessel market put large pressure on the vessel market in recent years

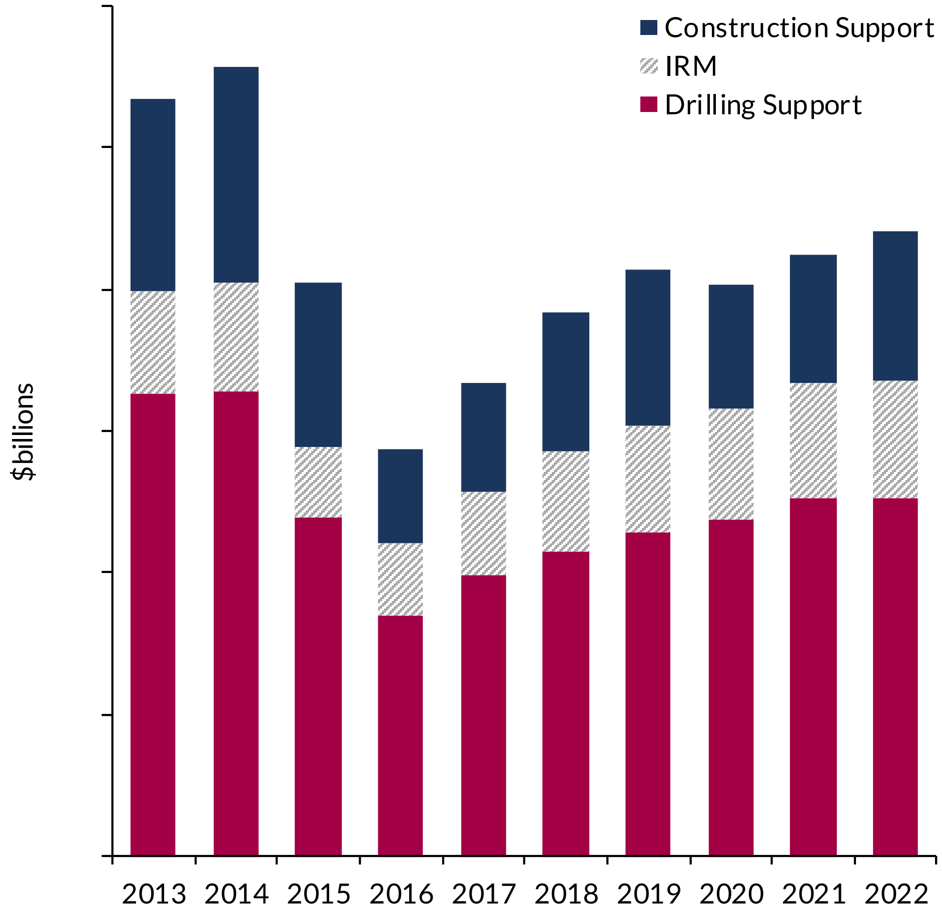


Subsea Vessel Operations Expenditure by Workscope

- Expenditure of $53bn, 2018-2022.
- Brazil biggest Capex spender, high number of tree installations.
- Oversupplied vessel market has supressed day rates. Modest growth through to 2022.
- Project sanctioning picking up but pressure on prices remains.

WGE ROVs

Expenditure for WROV support will reach over $10bn as demand begins to improve.



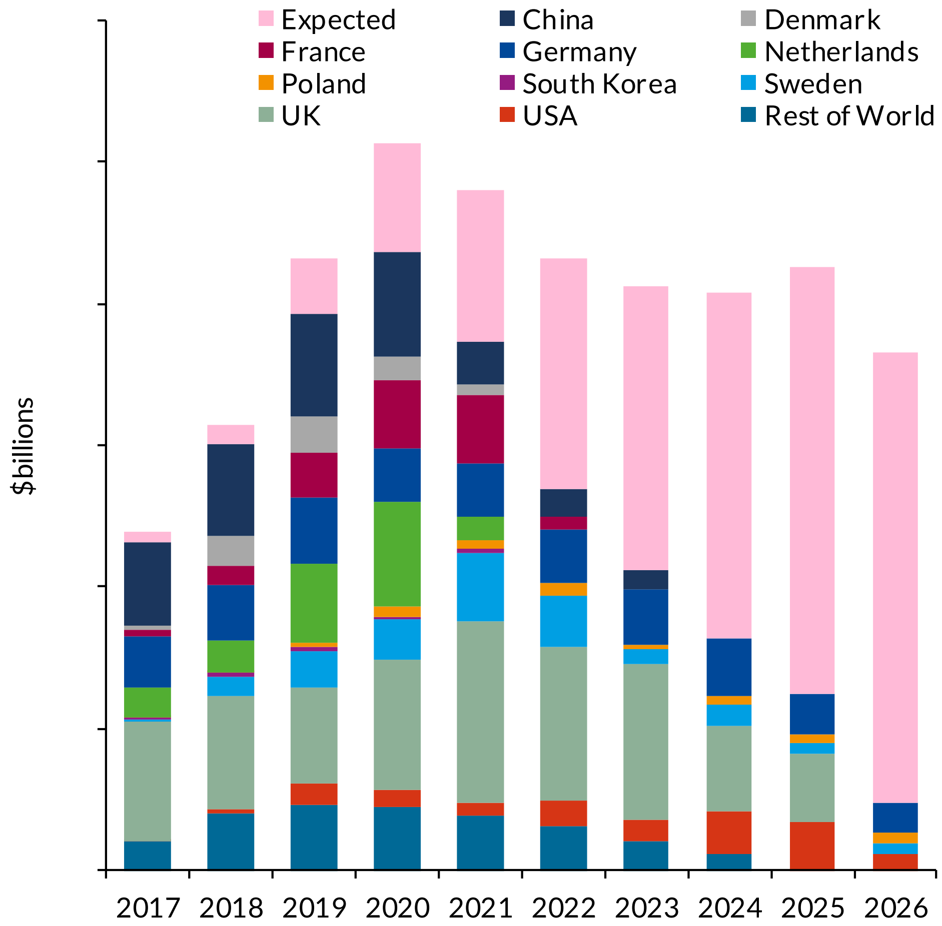
ROV Operations Expenditure by Workscope

- Drilling support will account for over half of both volume and expenditure.
- After a decline due to delayed maintenance, IMR activity will see consistent growth.
- Asia to account for largest volume of activity and spend due to a large installed base and a number of new projects.

WGE Offshore Wind

Westwood Global Energy Group

Offshore wind sector to benefit from the increased scale of project in both project capacity and turbine capacity.



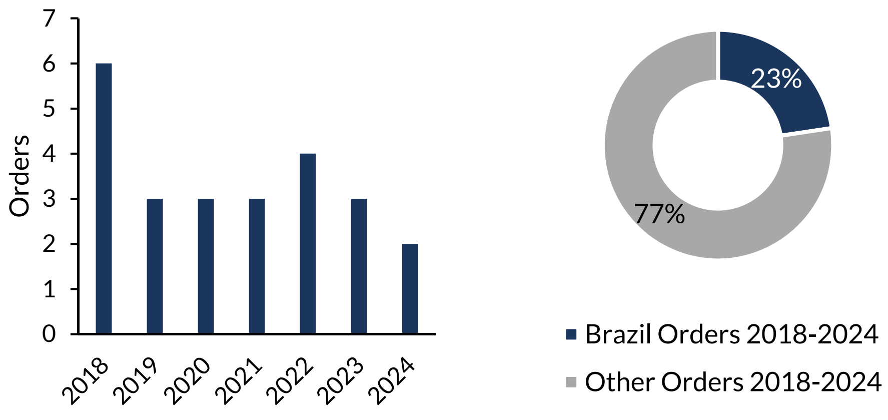
Offshore Wind Expenditure by Country

- Global capacity to increase 431% between now and 2026 – additional 57 GW.
- €420bn to be spent globally.
- UK, Germany and China are largest markets. The US, France and Poland are key emerging markets.
- Wind farms moving further from shore and in deeper waters.
- 42,200km of Cable to be installed.

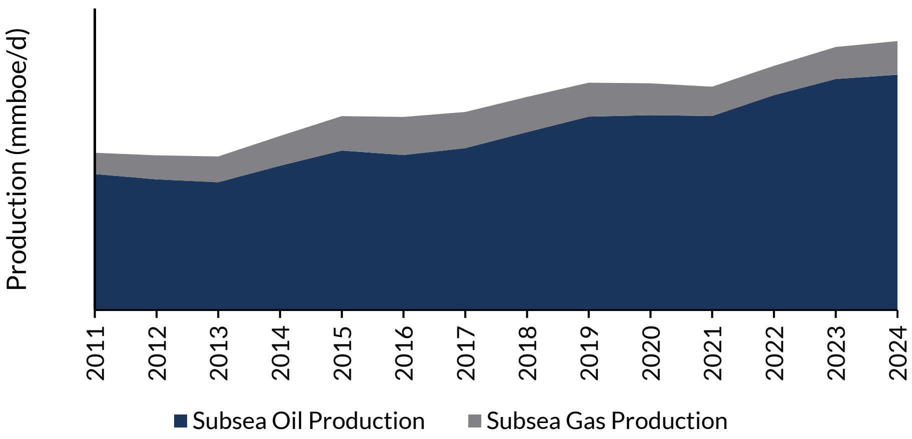
04 Countries in Focus

Westwood Global Energy Group Countries in Focus

WGE Brazil



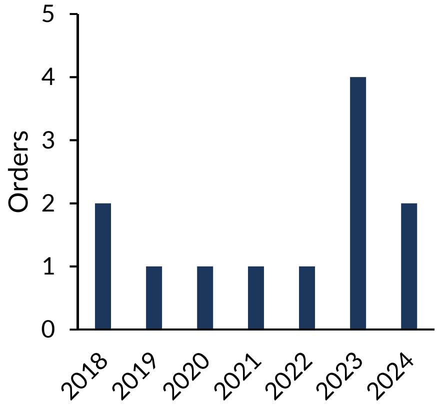
Brazil Expected FPS Orders

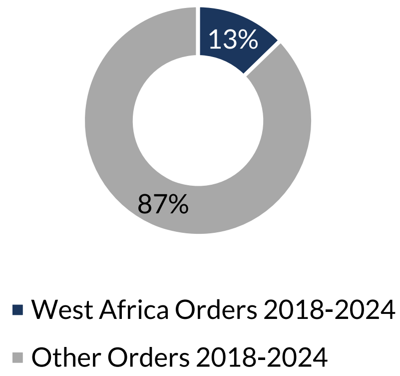


Brazil Subsea Oil & Gas Production

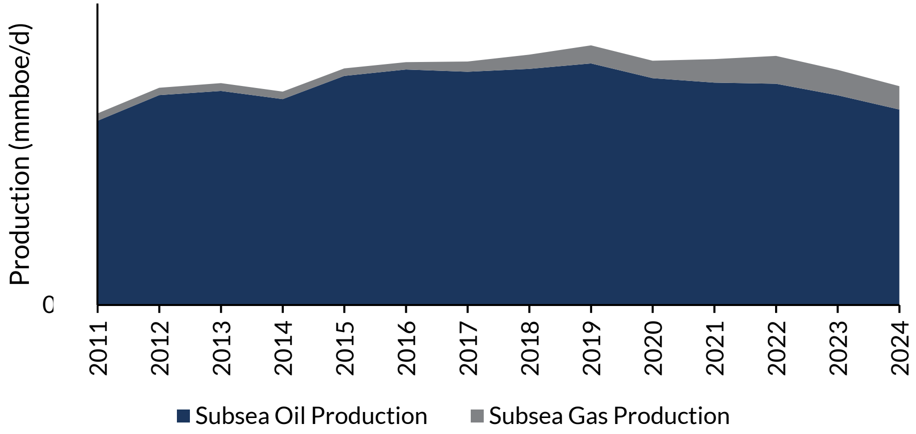
- Sector opened up following local content change
- Six FPS orders expected this year
- 23% of all FPS orders destined for Brazil
- One fifth of tree installations to occur in Brazil

WGE West Africa





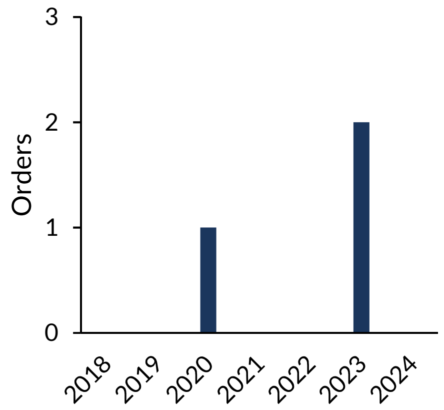
West Africa Expected FPS Orders

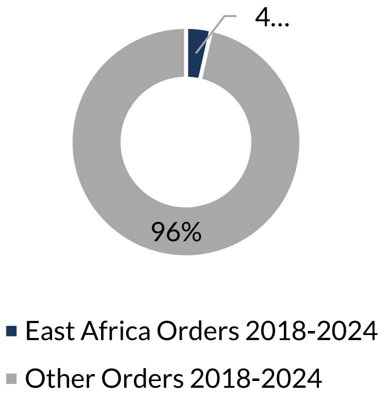


West Africa Subsea Oil & Gas Production

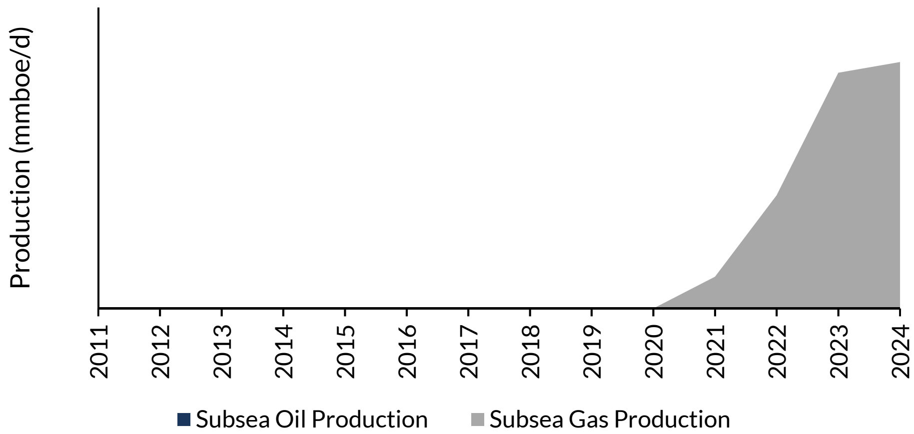
- Pre-down contract awards supports near-term production
- Region at start of relative barren spell
- Nigerian PIB delays + oil price crash responsible
- No long-term recovery for Angola
- Nigerian recovery towards end of forecast but high risk area

WGE East Africa





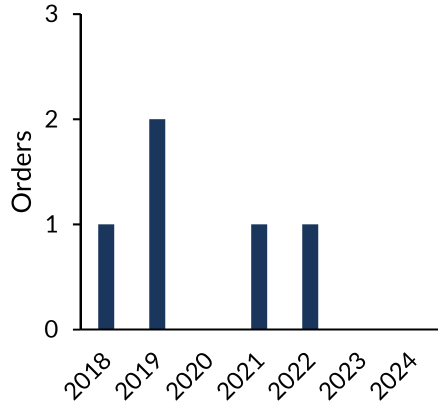
East Africa Expected FPS Orders

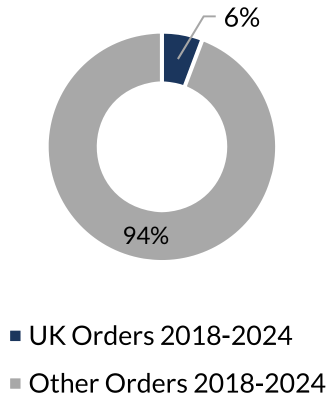


East Africa Subsea Oil & Gas Production

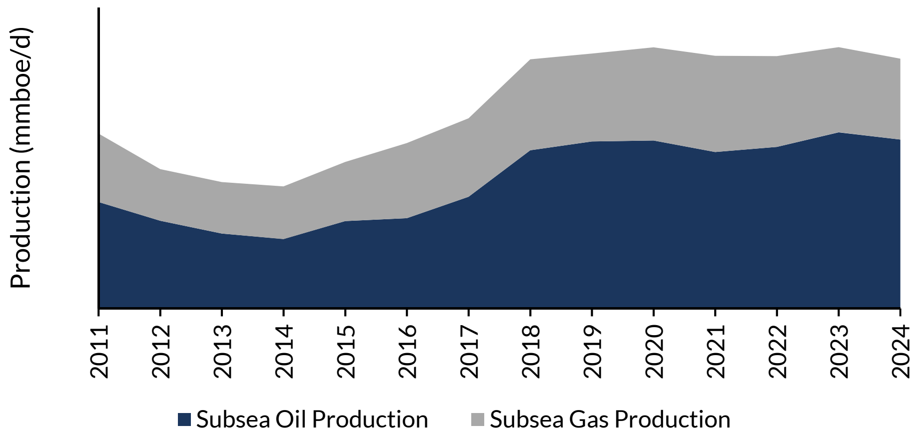
- Oil in steep decline, gas to show sharp growth
- FLNG opportunity due to lack of existing subsea infrastructure
- Mozambique to dominate spend
- Subsea to grow from 31% of total gas production 2020 to 80% by 2024.

WGE UK





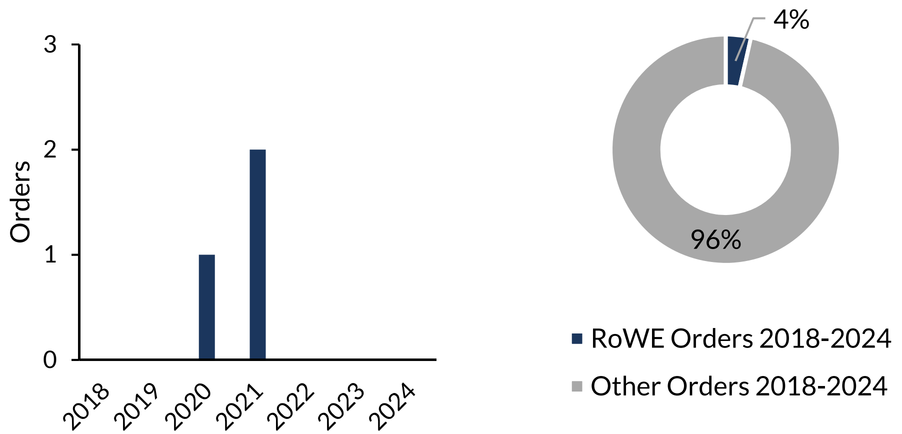
UK Expected FPS Orders



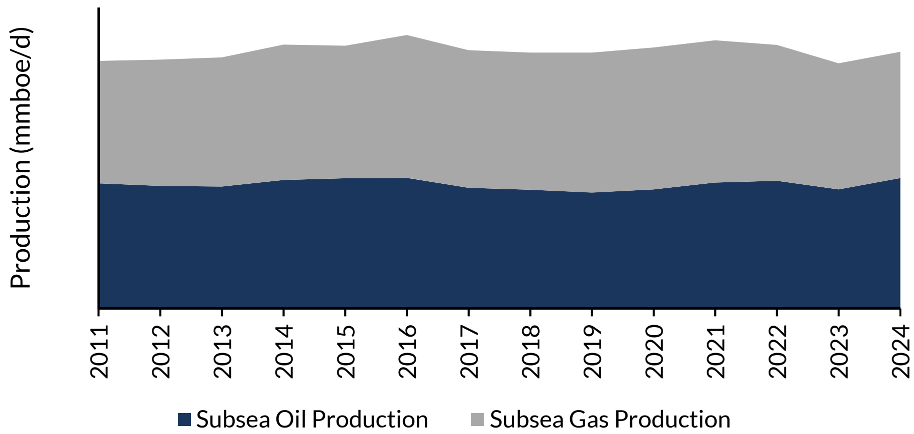
UK Subsea Oil & Gas Production

- 2018 subsea production 104% higher than 2014, projects sanctioned pre-downturn
- Focus on near-field exploration could yield tiebacks
- Penguins redevelopment sanctioning shows continued IOC interest

WGE Rest of Western Europe



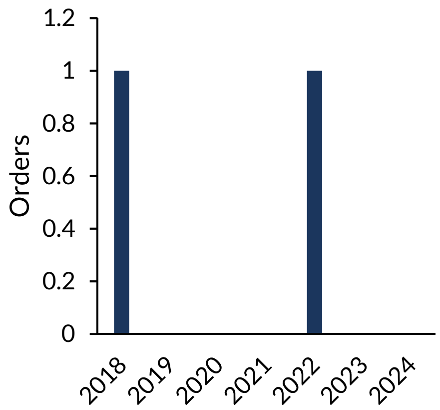
Rest of Western Europe Expected FPS Orders

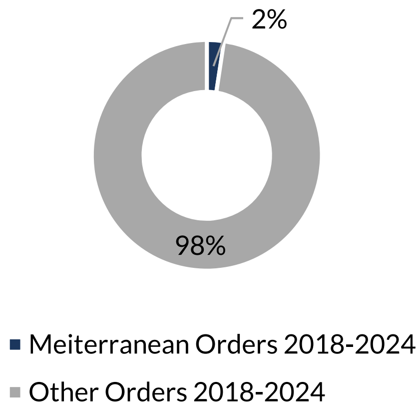


Rest of Western Europe Subsea Oil & Gas Production

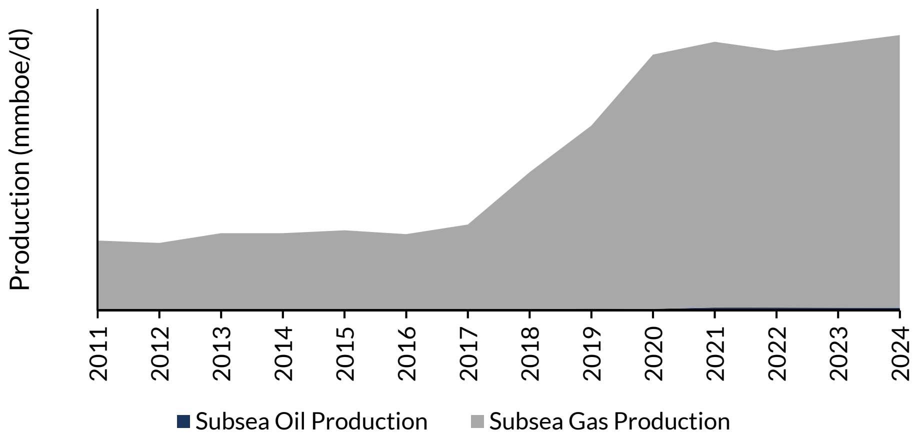
- Many offshore sectors now focused on renewables
- Tyra redevelopment highlights key projects still sanctioned
- Norway to continue traditional subsea dominance
- Subsea cable installation driven by offshore wind will support investment activities in Europe

WGE Mediterranean





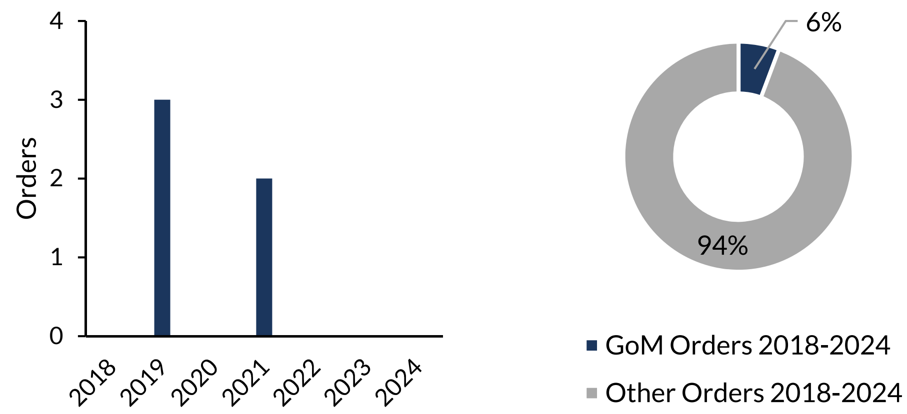
Mediterranean Expected FPS Orders



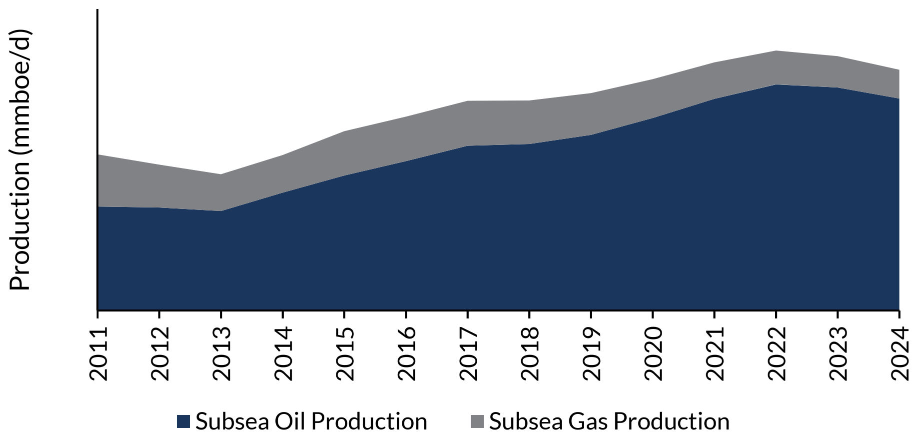
Mediterranean Subsea Oil & Gas Production

- Immature gas plays in eastern Mediterranean to change fortunes of several countries
- Network of fields in Cyprus, Israel and Egypt to require extensive subsea infrastructure
- Egypt is expected to re-start gas export in 2019

WGE Gulf of Mexico

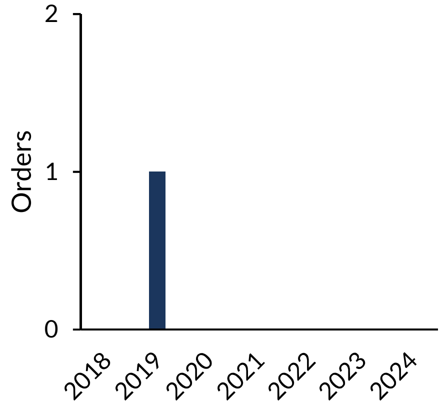


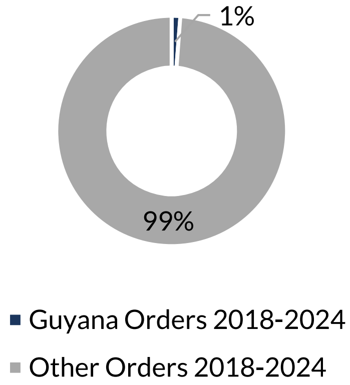
Gulf of Mexico Expected FPS Orders



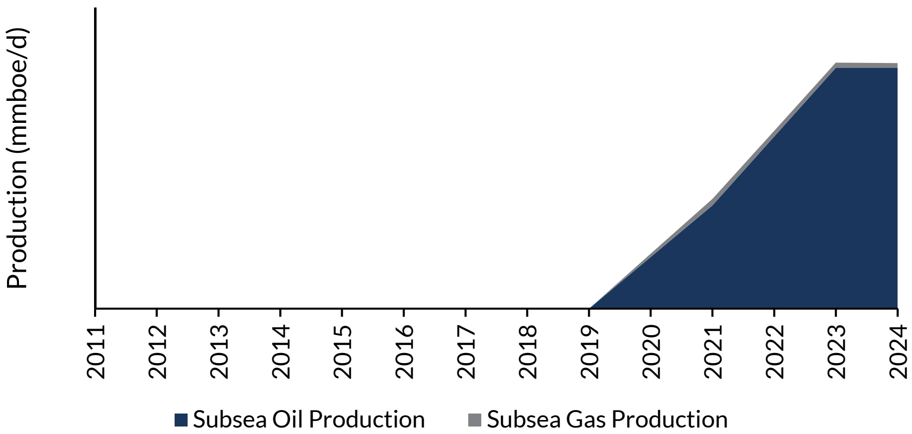
Gulf of Mexico Subsea Oil & Gas Production

- Backlog of pre-downturn developments still being worked through in US
- Mexico to benefit from foreign investment in medium-term
- Limited FPS orders over the forecast, however, subsea tiebacks provide potential upsides for investments





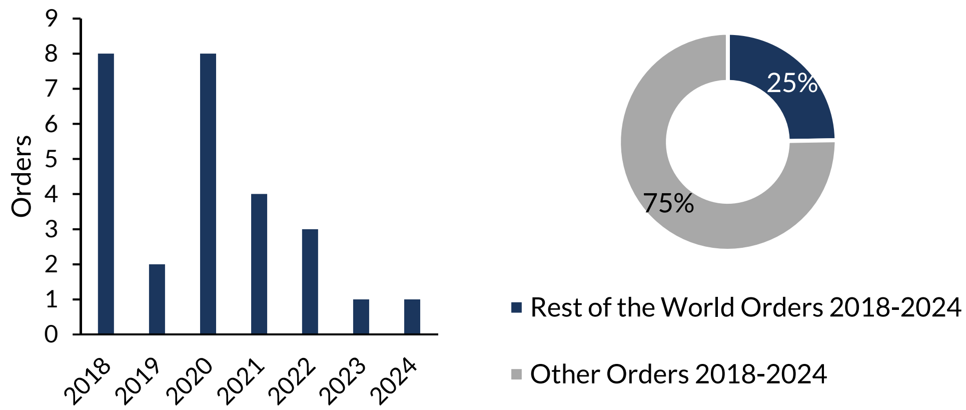
Guyana Expected FPS Orders



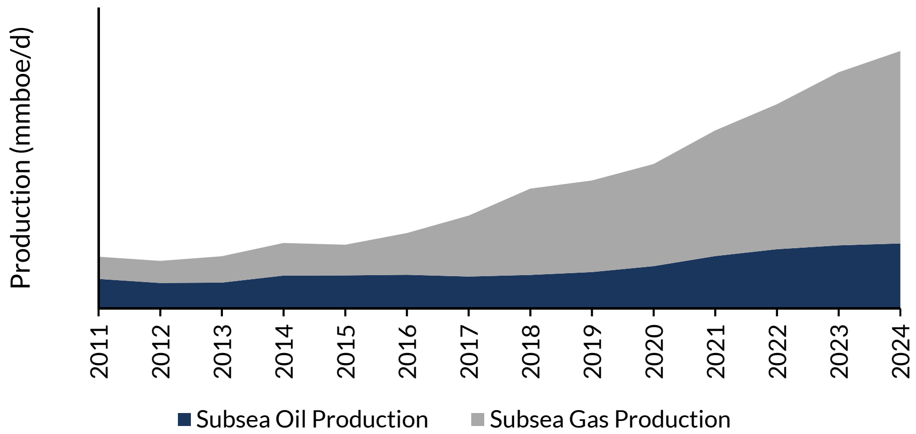
Guyana Subsea Oil & Gas Production

- Liza one of the largest new producers in forecast period
- A super size FPSO is expected to be ordered in 2019
- Exxon's success continuing, 5 discoveries – potential for more FPS orders & higher production

WGE Rest of World



Rest of World Expected FPS Orders



Rest of World Subsea Oil & Gas Production

- China and India both seeing increased subsea investment – 4 FPS orders in 2018
- Gas to increase 123% 2018-2024 driven by Australian LNG projects
- 12 FPS units to be ordered in Asia and 7 in Australia

05 Conclusions

WGE Conclusions

Westwood Global Energy Group

- Oil price recovery is positive for the industry particularly when combined with lower costs for equipment, engineering and services
- The recovery is fragile, however and everything hinges on OPEC
- Subsea and FPS market has improved markedly in 2017 with a resumption in project sanction.
- E&Ps remain focused on capital discipline and supply chain pressures will remain with substantial excess capacity throughout the offshore supply chain.
- Deepwater activity continues and returns in some fields are more attractive than onshore shale.
- Costs continue to tumble in offshore wind and many O&G supply chain firms are participating.
- Positive outlook for 2018 albeit all eyes on OPEC for continued discipline

06 Questions?