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National Policy and Corporate Strategies Driving Collaboration in the Global Offshore O&G Supply Chain

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Tuesday 14:30-17:00 - Auditorium
Transformation in the oil & gas supply chain: GLOBOIL
Chair: Helge Ryggvik (N), TIK Centre, University of Oslo
Co-chair: Antonio Botelho (BR), Universidade Candido Mendes.

Context

Brazil's combined deepwater and ultra-deepwater pre-salt assets' projects, discovered from 2005, will be among the largest in the coming decade.

As from 2005 to 2010 when they drove the boom and bust in the domestic shipbuilding industry, they present a unique opportunity for the consolidation of the evolution of a domestic manufacturing supply chain competitively integrated into an innovation-driven global value chain.

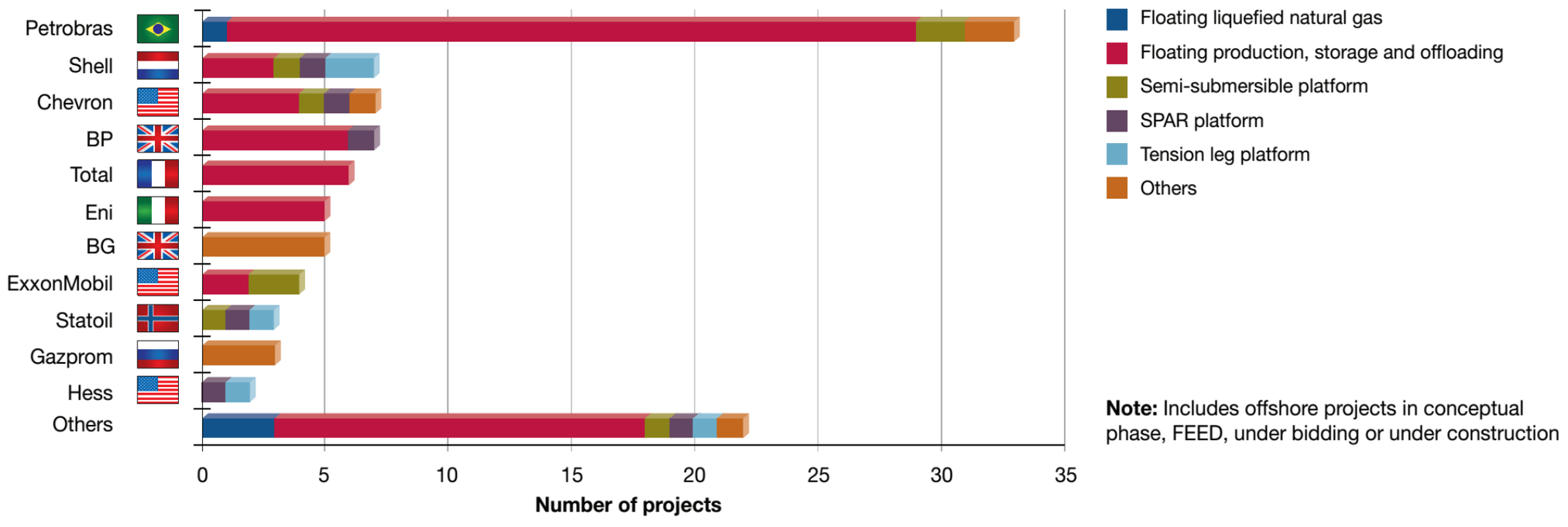
Between 2018 and 2025, about $790bn will be invested in 615 upcoming oil and gas fields globally, with conventional oil capex alone 44% ($350bn).

Brazil O&G industry represents the single largest capex during this period: $80.7bn or over 10.2% of total capex.

The 2017 and 2018 auctions attracted 20 new operators, including majors ExxonMobil, Shell, BP, Equinor (former Statoil) and Chevron as well as new entrants from all over the world including China, India, Vietnam, Malaysia and Australia.

Global oil & gas majors are committed to Brazil with around 40 international companies active in Brazil's upstream market.

Figure 1: **Petrobras and selected global oil majors offshore projects**



Source: *Petrobras 2012, BG*

Premises

- Large and complex global value chain
- High tech manufacturing
- Long supply chain
- Large potential multiplying /spillover effects on productivity
- MNCs first tier suppliers dual challenge: cost reduction and competence expansion / extension
- Shifting competitive landscape
- **Increasingly main markets are in emerging countries, critical learning and innovation experimentation opportunities**

Analytic Framework

- **V**ast international business lit. shows that **processes of upgrading of local suppliers promoted by foreign companies can occur under some conditions.**

- MNCs, in particular, can play a positive role in upgrading local suppliers when internal capabilities (Blalock and Simon, 2009) and non-market institutions are present (Corredoira and McDermott, 2014).

- **MNCs themselves seem to learn from the process of adapting their production systems to local conditions and developing new company-based innovation systems** (Herrigel et al., 2013).

Theoretical Considerations

Corporate Production System (CPS)

An alternative narrative (Herrigel and Zeitlin 2010) by advancing a potential positive role for MNC subsidiaries in upgrading local sub-suppliers through direct collaboration and, complementary, in their contribution to overcome the obstacle of low levels of education and vocational skills (Wilkins 2010).

Both MNCs and local companies establish more open-ended, experimentalist, and positive relationships than normally conceived.

"Their experimentalist character enhances the capability of companies to negotiate uncertainty in their market and technological environments by encouraging organizational recomposition in response to challenges. When they are working properly, experimentalist systems foster and diffuse both organizational and technological innovation within companies and across supply chains. ***As such, they enhance the competitiveness of manufacturers in advanced political economies and induce continuous upgrading of producers and regions in emerging economies.*** (Herrigel 2015: 1)

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Herrigel, Wittke and Voskamp (2013)

At later phases learning-driven upgrading, possibility that when local suppliers acquire a high level of competence to meet the demand, **MNCs can shift their commitments to emerging markets towards more collaborative, design intensive and higher value-added relationships where the process of upgrading happens more substantially.**

To achieve this kind of collaboration, they use formal procedures such as **Corporate Production Systems (CPSs) and continuous improvement teams**.

Thus, **reflection and experimentation are systematically induced, producing learning processes that generate manufacturing improvement**.

The **ambiguity of roles and the need for suppliers and customers to innovate** and improve their products **continually make collaborations contingent**.

Argue for the growing trend of **Contingent Sustained Collaborations (CSC),** that is, the **definition of roles as re-compositional and flexible.**

Collaboration

A distinctive form of governance - as opposed to a non-collaborative arrangement.

The level of collaboration indicates the extent of shared knowledge and learning related to the scope of the partnership, as well as the responsibilities that are delegated. (HELPER, 1991; SAKO, 1992; HELPER; SAKO, 1995; HELPER; SAKO, 2010).

Correlations between <u>forms of governance</u> and <u>upgrading processes</u>.

Collaborative upgrading

- When client-companies help their suppliers in the process of upgrading
- Secure reliability and quality in the supply chain
- Monitor uncertainty in production;
- Source of continuous learning and benchmarking in global supply-chains
- Variety of ways: managerial training, technology-transferring.

Brazil

Brazil

From Campos Basin shallow waters to ultra-deep Pre-Salt

Highly successful, concentrated O&G innovation system in one national firm: inward-looking and broad scope

Shifting scale and nature technological challenge calls for more open innovation system

Financial turmoil pressures corporate downsizing, RDI scope reduction and timely production

Actor constellations:

- Attraction of foreign first-tier suppliers
- Extensive academic thematic networks
- Domestic suppliers have low technology learning and absorptive capacities
- National oil firm partnerships with first tier supliers

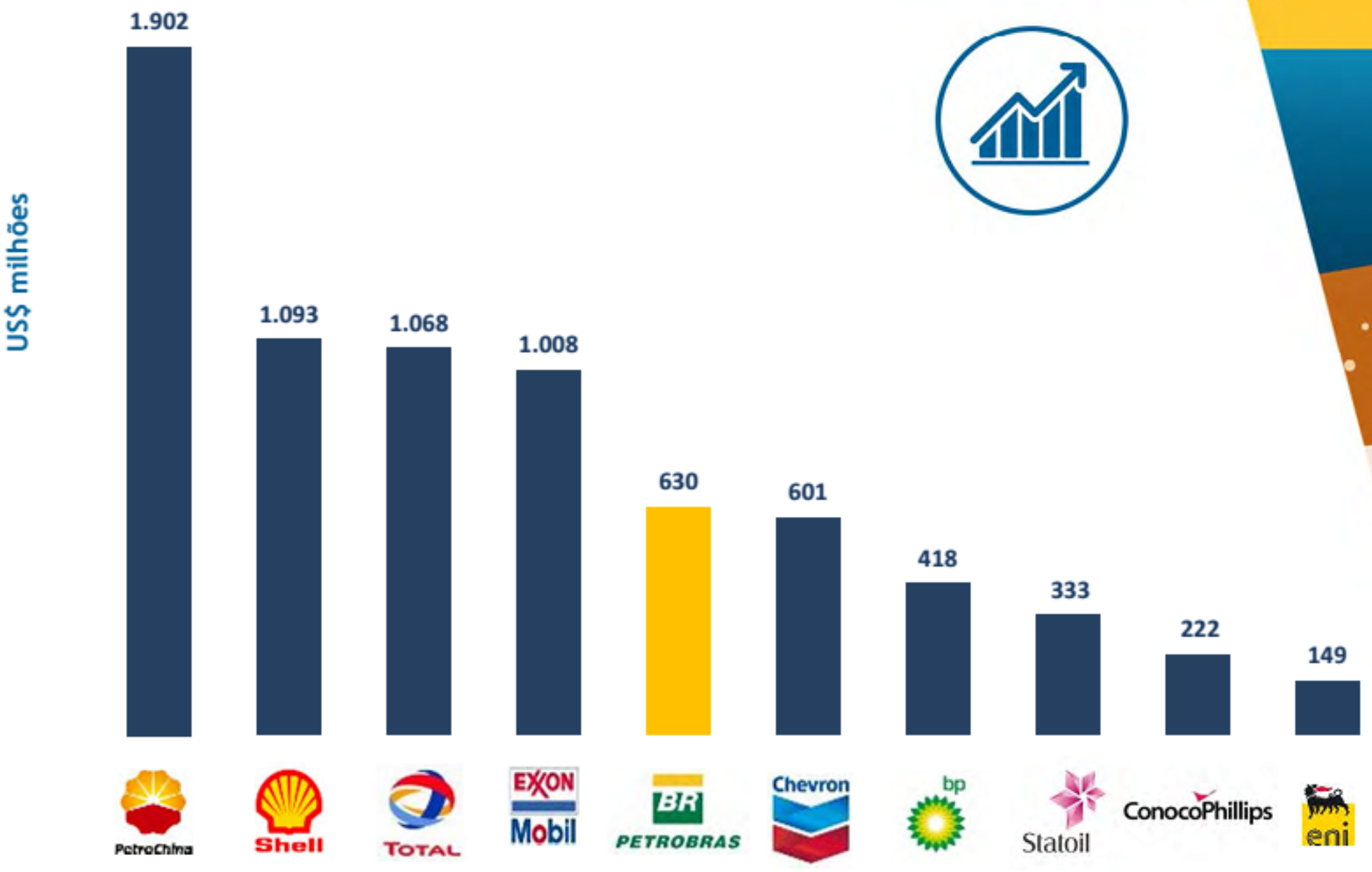
Support for innovation:

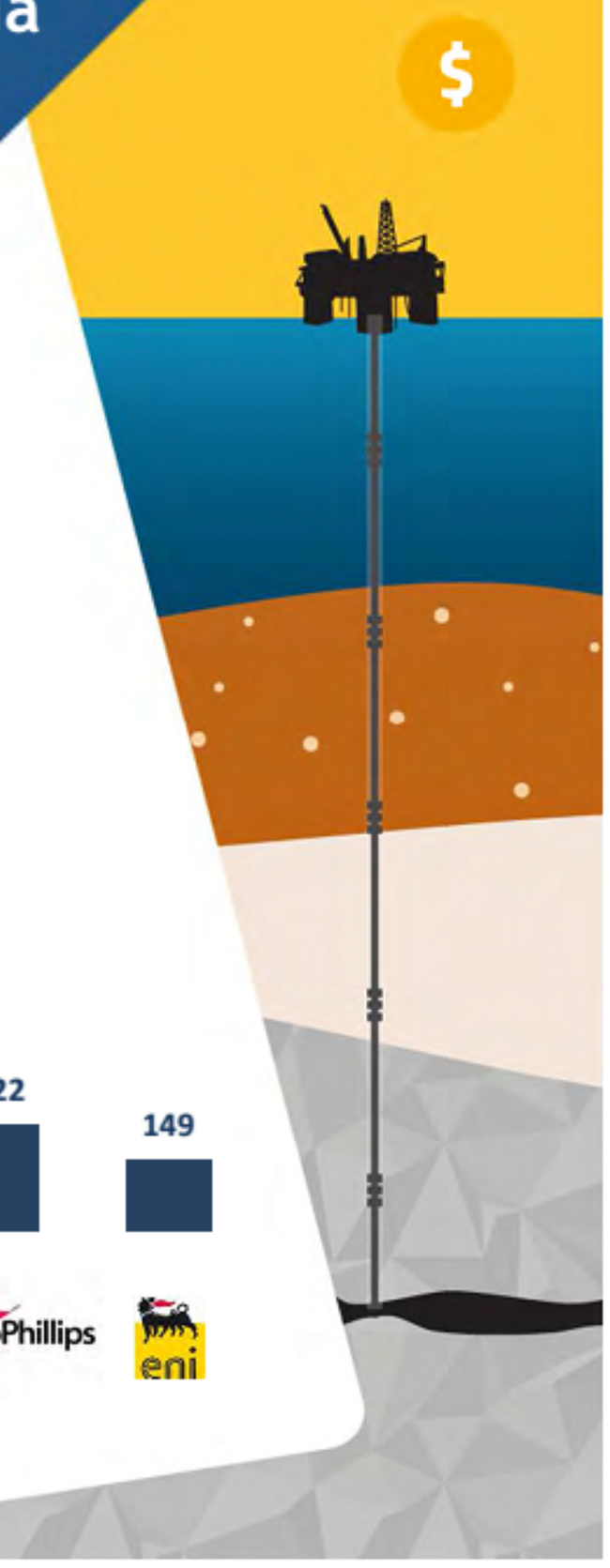
- National oil firm fund the majority of costs, supported by regulatory R&D mandate
- During the last 10 years, increased tailored support for petroleum R&D (FINEP/BNDES)
- Suppliers overall limited private investment in R&D

Innovation

Investimentos

Empresas que mais investem em P&D na indústria do petróleo





Fonte: Evaluate Energy, 2016. Dados referentes a 2015.

- **For suppliers, investment in R&D is less important for innovation performance than innovation collaboration**

Source: SIVAC Project, 2018

Collaborative innovation and the role of suppliers in innovation networks in OG

- Collaboration is a main mechanism for innovation in the sector
- R&D&I networks in the sector are wide and dense
- Networks have developed over time

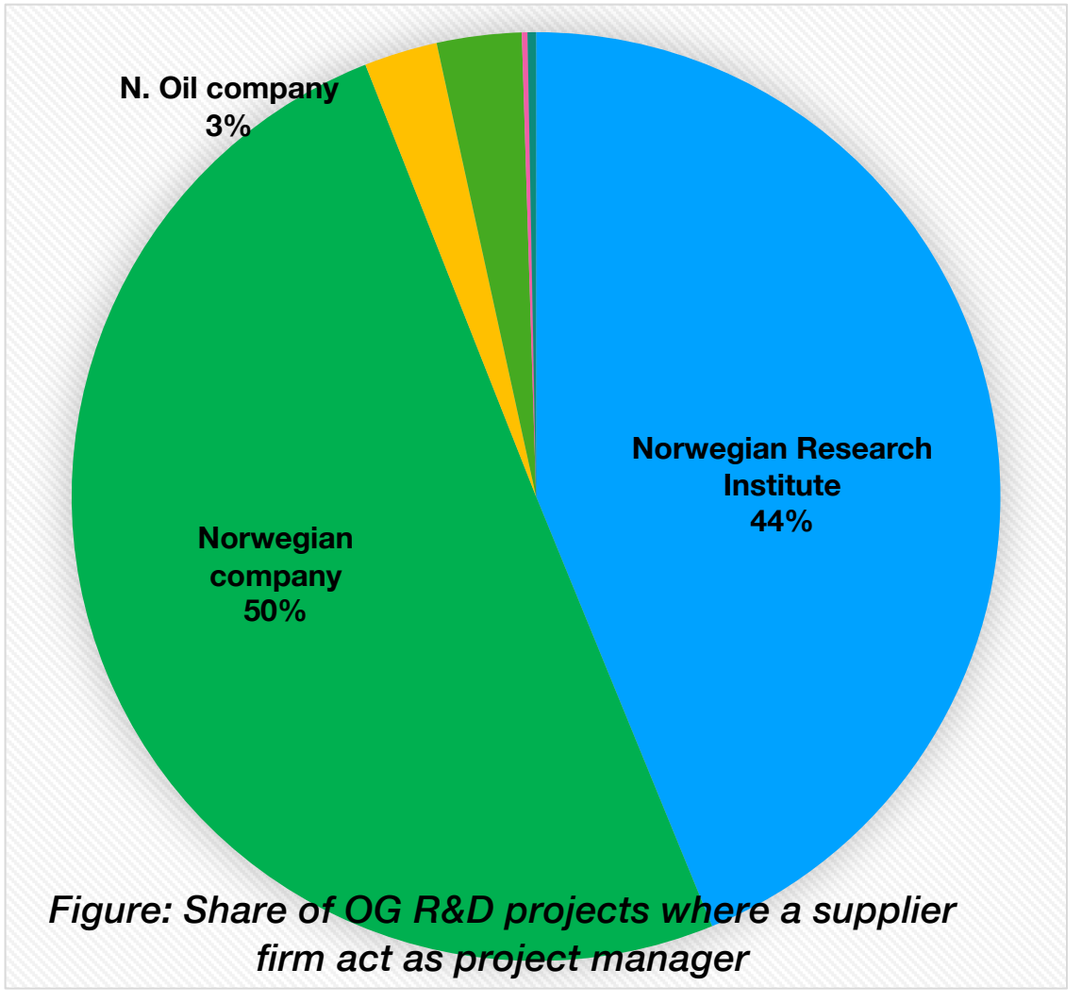


Figure: Share of OG R&D projects where a supplier firm act as project manager

Source: SIVAC Project, 2018

Collboration under uncertainty

OFFSHORE FIELD COMPONENTS

Topside EPC

Topside control system

SURF

Subsea production system

Downhole/ Reservoir

TechnipFMC

TechnipFMC

TechnipFMC

Agreements

Joint Venture/ co-ownership

SIEMENS

ABB

Subsea control system technology coop.

SAIPEM

Efficiencies through early SPS/SURF integration

AkerSolutions

Reservoir to SPS subsea integration

BAKER HUGHES a GE company

KBR

Design support, project execution

subsea 7

Deliver reservoir to surface system

OneSubsea

Increase operating envelope of subsea well intervention

Schlumberger

HELIX

Source: SIVAC Project, 2018

Equinor seeks Brazil's biggest FPSO for Carcara - Pre-FEED under way for newbuild unit with much more flexible parameters than the traditional Petrobras model of contracting

19 June 2019 17:03 GMT UPDATED 1 July 2019 13:55 GMT

by Fabio Palmigiani and Gareth Chetwynd

Norway's Equinor is preparing to take a giant leap forward on its operations in Brazil with a groundbreaking project to contract what will become the country's largest floating production, storage and offloading vessel for its Carcara pre-salt development in the Santos basin.

The FPSO being sought will be deployed in water depths of approximately 1990 metres and designed to produce 220,000 barrels per day of oil and process 15 million cubic metres per day of natural gas. It will have storage capacity of 2 million barrels of oil.

The Carcara FPSO is expected to be a newbuild and industry leaders Modec and SBM Offshore are working on pre-front-end engineering and design studies focusing on the concept model for the FPSO.

A diversity of operators is always welcome news to contractors, but many are clearly thrilled with the prospect of doing business in Brazil in a different manner.

"Petrobras is very rigid when it comes to contract requirements for FPSOs, drilling rigs and supply boats, so it is really a good thing to have international oil companies participating in the pre-salt development, as they tend to be more flexible and pragmatic," a source comments.

Equinor is pursuing field-proven solutions for Carcara-1, but instead of setting strict design parameters, the company is keen to take advantage of the capabilities and proven solutions of both Modec and SBM through the pre-FEED process.

Equinor has been engaging in "gap" meetings in which the company takes its general specifications to contractors and allows industry specialists to show their capabilities and bring their proposals to the table — the idea being that the best solutions will emerge.

“We want to use their expertise and knowledge in the Brazilian pre-salt to come up with the best possible project for Carcara. It is a very collaborative work,” says Equinor Brazil vice president of supply chain Mauro Andrade.

For the sub-surface, Equinor has invited TechnipFMC and a pairing between Subsea 7 and OneSubsea to carry out concept screening studies for the subsea layout for Carcara-1.

As with contracting of the FPSO, suppliers have been given considerable freedom to come up with their own design proposals covering the whole subsea umbilicals, risers and flowlines package.

TechnipFMC to split into two companies

27 Aug 2019 - Upstream Costs and Technology | Headline Analysis

Helge QvamSenior Principal Researcher

TechnipFMC plan to separate into two publicly traded companies: RemainCo, a technology and services provider and SpinCo, an engineering and construction (E&C) player.

With approximately 15,000 employees SpinCo will be one of the largest engineering and construction pure-plays and positioned to capture LNG opportunities as a result of its proven track record. The company would comprise the Onshore/Offshore segment, including Genesis – a leader in front end engineering and design. SpinCo would also include Loading Systems, a leader in cryogenic material transfer products, and Cybernetix, a technology leader in process automation, that have historically been a part of the Surface Technologies and Subsea businesses, respectively.

With approximately 22,000 employees, RemainCo would be a fully-integrated technology and services provider. The company's role will be to support clients in the delivery of unique, integrated production solutions. As TechnipFMC has transformed the industry through its pioneering, integrated model in Subsea, RemainCo will aim to apply the same winning formula to Surface Technologies.

OPINION: Digitalisation is key to new Schlumberger

11 September 2019 18:59 GMT UPDATED 12 September 2019 5:11 GMT

OPINION: There is nothing new about Olivier Le Peuch himself - he is a Schlumberger journeyman who started at the bottom and went to the top. The more interesting side of Le Peuch's policy statement at the Barclays CEO Energy-Power Conference, in New York, were his comments on "localisation" and "digitalisation".

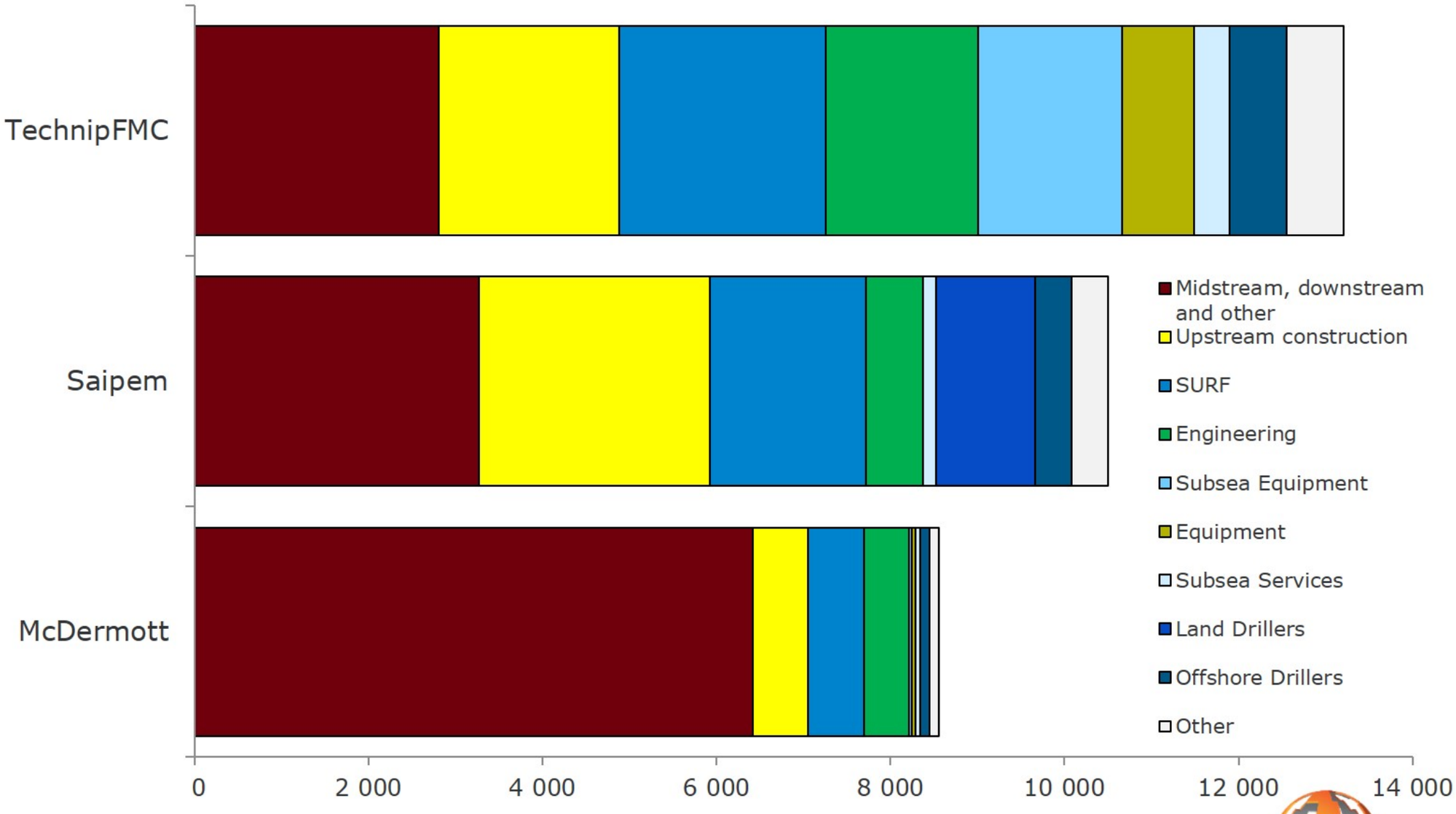
The Schlumberger boss has rightly picked up on the fragmentation of the international oil and gas world. This is partly a result of the wider acceptance that the world must decarbonise to beat global warming. And partly it is a result of the rise of populism that is breaking the past political and economic consensus around globalisation.

As Le Peuch said: "Today's geopolitical uncertainties and trade conflicts will only amplify this trend, moving from a global market toward a more localised supply and demand dynamic."

Schlumberger is determined to take advantage of, rather than be threatened by, this changing landscape by setting up "fit-for-basin" local businesses. This will include using its expertise to help countries decarbonise through efficiency gains.

Most importantly, Le Peuch is promising to be a standard bearer for digitalisation in the oil and gas sector.

TechnipFMC and peer group
2018 Revenue (MUSD)



Source: Rystad Energy ServiceCube, August 2019

RYSTAD ENERGY

Take-outs

- More diversified O&G companies in Brazil
- Multiple and competing national supplier network
- Finance a major driver

- **From ‘produce where you sell’ to ‘innovate where you produce’ (contracting for innovation)**
- **Need to support domestic suppliers to become actors in O&G supplier network & innovation system**
- **Move from collaborative upgrading to collaborative innovation**

- **O&G MNC first tier suppliers**, which manage global corporate production systems, have potential advantages in dealing with a diverse pool of local sub-suppliers.

- **'Intelligent' policy (LC and/or other) can be instrument to assist domestic companies to upgrade** and further enter internationalized supply chains e.g. O&G.

- **Full development of local suppliers through collaborative upgrading, with the goal of a medium-term integration into their global CPS, must bee seen as a strategic component of competitiveness**.

Thank you

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