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# Decommission in Petroleum Industry: Current Status, Future Trends and Policy Advices

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**Abstract.** A wave of global decommission is coming, with rising trends of resource autonomy and environmental awareness in resource countries. Decommission plan is a difficult decision for governments and oil companies. It is hard to keep balance between attracting investment and ensuring effective supervision. For Oil Companies, it is also tough to find exact timing between future abandonment cost and current profit. In this paper, we analyse the present situation and future trends of global decommission, and carry out key case studies. On this basis, we put forward suggestions from both government and enterprise levels.

## 1. Introduction

There is no clear definition of decommission in international and many national legislation. It usually takes on words like 'abandonment', 'disposal' and 'removal'. It has mentioned in the UK Petroleum Act (1998) and the 2011 Decommissioning Guidelines (Department for Business Energy and Industrial Strategy UK, 2011). The generally accepted term is 'decommissioning programme' in the Petroleum Act. Decommission process is the process of closing down in an industrial facility and method. In general, decommissioning spend refers to the cost of running a field in the final stage of the life cycle of the field. The average cost of a decommissioning program varies hugely with projects which include abandonment of wells, removal of the platform and associated facilities. Typically the most costly decommissioning work comes at the end of the field's life, with spend ramping up after cessation.

The primary reason of globally rising decommission spend is the maturing of the main producing regions, such as the North Sea, Gulf of Mexico and Asia Pacific. The situation has been compounded by the oil price crash, and appeals for longer environment, which have both increased pressure on operators of mature fields with declining production. The exact cease timing is highly uncertain, because of keeping balance between the profit, financial cost and environment. It is hard for companies to plan the specific removal method, phasing of spend, and to palace the contract.

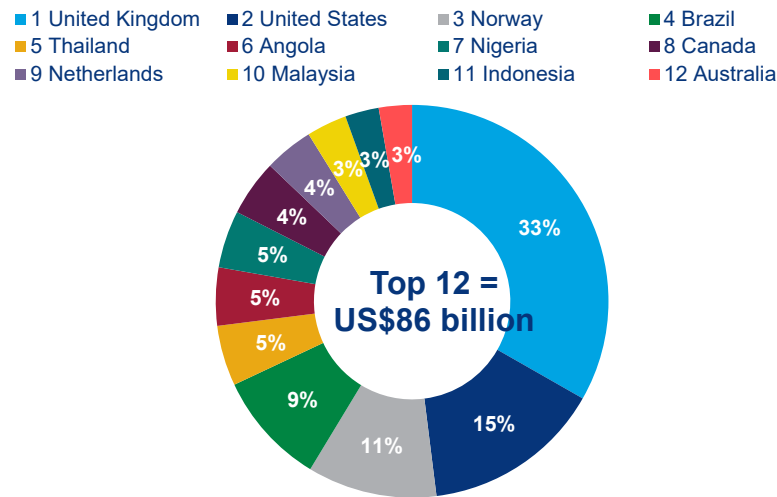
There is little experience in accurately forecasting decommissioning spend. In this paper, forecasts are based on the cost from well abandonment cost and platform and pipeline removal which are changed based on the environment, country and contract.

## 2. Current status and future trends of global decommission

More oil & gas producing regions are mature, such as the North Sea, Asia-Pacific and US Gulf of Mexico. In Asia-Pacific, 20% of offshore facilities are over 20 years old, which is beyond their design life. In UK a third of operational platform are over 30 years old and will cease in the near term.



According to United States government data, 100 platforms are abandoned annually from 1980's in US Gulf of Mexico.



Source: Wood Mackenzie

Figure 1. Top 12 spender by country in the next 10 year.

Almost 700 field will cease production over this period. This brings a huge bill for Oil Company. [1] The estimated bill for decommissioning is increasing year-on-year. According to Wood Mackenzie data, the top 12 spenders by country will spend US\$86 billion in the next 10 years. The top 10 companies are expected to spend US\$14 billion from 2018 to 2022. Wood Mackenzie forecasted the global decommission spend will amount to U.S. \$38 billion between 2018 and 2022, up from US\$18 billion over the past five years. These spend is not a lot for global offshore development, about 2% of total CAPEX in Oil Company in 2017. The wave of decommission will be coming. The remaining decommission costs for offshore fields will be US\$340 billion beyond 2022. [2]

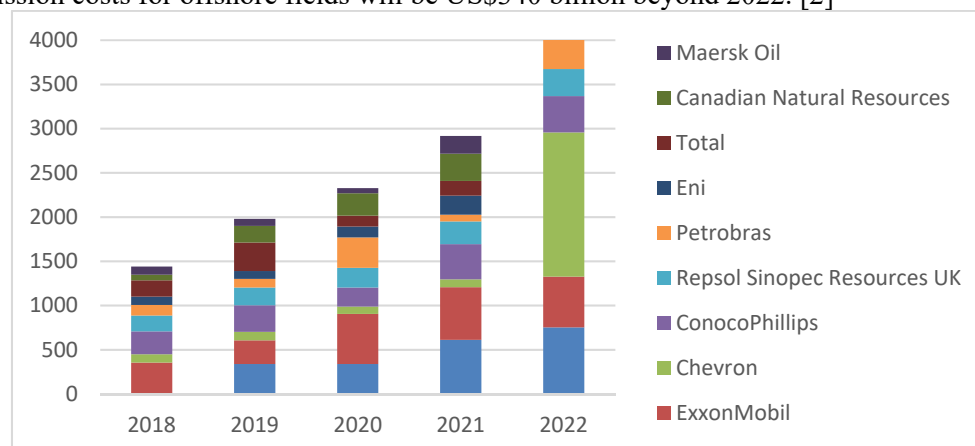


Figure 2. Top 10 spender by company in the next 5 year.

There are a lot of uncertainties about decommission which have a big impact for operators, governments and banks. The problem is still not resolved regarding cost, timing, who pay the bill and where that money comes from.

### 3. Case study-Chevron Contract Area 1 in Thailand

Asia Pacific is a mature region with over 1000 platforms operating beyond their design life of 25 years. Decommission is a new challenge in Asia Pacific. Chevron has forged a different path in this area. We choose Chevron-operated Contract Area 1 in the Gulf of Thailand for case study.

In the base case scenario, the estimated decommissioning liability for chevron-operated contract is US\$ 1 billion over the next 16 years, starting in 2018. But there is a scope for significant cost savings.

### *3.1. Transferring knowledge between experts, regulators and operators*

Operators can play a part in helping draft regulations, particularly those that already have extensive experience in offshore asset retirement. Chevron has collaborated with the government departments of minerals in Thailand, gained experience with decommissioning operations and moved up the learning curve. The cost of wells, wellhead platforms and pipelines could be saved up to 15%.

### *3.2. Choosing the right commercial and contracting strategy.*

Furthermore, project management team can choose the best combination of the contracts to avoid cost blowouts on the basis of company actual condition. Chevron integrated the company's internal resources, monitored the entire disposal process and decommission management, and realized a significant reduction in abandonment costs. Chevron's contract areas have over 4000 wells and 300 platforms. For areas with a large number of ageing wells and platforms, batch decommissioning offers cost-saving opportunities. Chevron has also significantly reduced the rig rate, which helped to reduce well P&A costs. Further cost saving of up to 40% on wells, 20% on wellhead platform and 10% on pipeline can be achieved through above method. [3]

### *3.3. Adopting disruptive technologies that can cut costs.*

Emerging cost-efficient disruptive technologies could reduce further cost, such as rig-to-reef and thermite plugs. For instance, rig time could be halved by using a thermite plug solution. The plugging is the part of the abandoned operation. The thermite plug solution can be conveyed on wireline rather than multiple trips with drill pipe to wash, cement and plug the well.

## **4. Suggestions for governments and companies**

With the rapid rising of fields ceasing and decommissioning spend, decommissioning is finally becoming a significant global issue and challenge to resources countries' governments as well as oil companies. It offers a steep learning curve with high costs and potential mistakes. In some countries, governments are lack of clear regulations and experiences of decommission. Companies are facing difficult decisions to choose exactly time and appropriate method to cease the production. Uncertainty around who pays for and who can afford decommissioning given reduced future cash flows is also a bottleneck problem. U.K. is a country with one of the most stringent and heavily regulations. However there are still confusions when it comes to decommission. Based on our study on decommission, we summarize some suggestions for governments and companies.

### *4.1. Suggestions for Governments*

Governments need to establish clear rules for decommissioning and tax reliefs. We suggest that decommissioning regulation will include three basic issues.

*4.1.1 Scope of decommissioning –the legal framework, what should be done.* In general, there are two approaches, a prescriptive approach and a goal-setting approach. In the prescriptive approach, the regulator sets out a series of detail requirements in which the operator must comply with. In the goal-setting approach, the regulator set legal boundaries and objectives which the operator must meet. These requirements and objectives includes safety requirements, the required depth and so on. For instance, it is prescribed as 15 feet below the seabed In the USA, while in the UK and Norway; it is set by the operator. [4]

We suggest the government set out specific regulations on decommission process. Regulator can choose above method on basis of Varity country situations. For example, Unite States and Thailand have took a more prescriptive role with stricter requirements. UK and Norway have took a goal-setting regime, and the goals are delimited by some regulatory limit.

*4.1.2 Tax terms–is tax relief available, who pays for what, in other words, the share of company vs government spend.* There are no detail provisions of tax term in fiscal contracts.

The concession system invariably relies upon a completely separate and distinct set of national laws to govern the decommissioning. The concession documents do not contain any provision on what is required to complete the decommissioning process. In most ASCOPE member countries, there are no suitable laws to provide clarity during the decommissioning phase. In concession systems, the funds may be required to be established but the deduction for tax purposes is usually far more complex. Earlier PSAs contained very little details on decommissioning. Modern PSCs usually include decommissioning fund terms and allow payments into the fund to be recoverable. Some Risk Service Agreements (RSA) are similar to earlier PSAs. It also contains very little direction on abandonment.

Each government with mature assets needs to develop new policy as soon as possible. Regulator may study the experiences and evolution of terms in the countries with the most experience – such as the US. In US, tax term is straightforward; decommission is treated as deductions for current and future tax calculations. The recent reduction in the US federal tax rate to 21%. Producers will receive less tax relief for upcoming decommission. The tax bill eliminated the ability to carry back losses and capped the deduction of losses carried forward to 80% of net income. This will make decommission harder to deduct immediately.

*4.1.3 Liabilities and ownership issues—financial framework, clear regulations for banks and oil companies about financing decommissioning, as well as government administrations if they participate in the project.* The government should have a bonds or a financial security framework based on different risk rankings of a company's profile. For instance, The UK framework is more robust, because its newly amended Energy Act (2016) established the Oil & Gas Authority (UK) as an independent regulator. The new regulator have the access to company meetings, data acquisition, and imposing sanctions (Department for Business Energy and Industrial Strategy UK, 2011). [6]In other words, it is able to take action at the early stages of trigger as it has access to acquire data or attend company meetings and mitigate the 'what if' scenarios of the operators not meeting these decommissioning milestones.

Governments also need to ensure operators, and their partner companies have relevant funding, to avoid taxpayers being left with decommissioning bills. At the same time, taxpayer should ensure they meet international obligations in the government opinion. Nowadays government wants funds to be put aside by the operators throughout field life to ensure they are not left holding the full decommissioning bill on their own.

#### *4.2. Suggestions for Oil Companies:*

Oil Companies can adopt more flexible approach to efficiently manage the decommission issue from the successful cases, which could reduce the cost significantly and ensure security of decommission. Cost can be reduced through the use of new technologies, lessons learned from previous programs, cluster decommission and divesting assets with large decommission spend.

Cluster decommission programs are new trend in the UK. That means companies group together fields in proximity to each other and decommission them as a batch. This new technology would bring saving of 20% on average. [5] Another way to reduce costs is to divest assets with large decommission liabilities. Shell reduced its UK decommissioning liability by 25% with one deal, the divestment of US\$3 billion of assets to Chrysaor.

To deal with this extensive and overlapping liability, the industry has developed DSAs (Decommissioning Security Agreements) in UK. Under such DSA, each participant in a JOA will agree to pay cash or other types of security into a trust, held until the end of the decommissioning process. If a party falls into financial difficulty, the security provided is intended to be sufficient to cover that party's share of decommissioning costs.

### **5. Conclusion**

The decommissioning program varies greatly based on the maturity of a region, the regulation in place, and the appetite from Oil Company to push ahead. Without a continued focus on this part of the oil and gas industry, a number of major issues could arise in the future. While opportunities exist for the

different stakeholder, there is still lots of work to do. We may be in the right direction, but it is not enough.

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