DECOMMISSIONING COSTS IN OIL AND GAS OPERATIONS IN NIGERIA: THEORETICAL REFLECTION

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Abstract
This study entails a theoretical review of issues arising on decommissioning cost in oil and gas operations in Nigeria. In Nigeria, the PIA (2021) builds on the existing framework of the Petroleum Act, which mandates the implementation of decommissioning programme in oil and gas industry. There are however concerns that indigenous oil and gas companies may not be able to discharge their decommissioning obligation, given the enormous cost involved. It is upon this premise that this paper tends to address some issues arising from the decommissioning costs of oil facility in Nigeria, and these issues include accounting for decommissioning cost, financing decommissioning programme, strategies for minimizing decommissioning cost, and tax implications of decommissioning cost. A critical review of the extant literature was made. In accounting for decommissioning cost, the accounting standards to apply are IAS 16 and IAS 37. To secure decommissioning cost, a decommissioning fund must be maintained by the company in the form of sinking fund. Since decommissioning cost is usually huge, companies must it cost using several strategies such as fit-for-purpose designs and technologies, factory model, innovative contracting model, building decommissioning teams, importing decommissioning skills and resources, excellent decommissioning planning and execution, cluster decommissioning programme, divestment of oil facility, and potential for reusing existing systems and structures. According to the Nigerian tax law, contribution to decommissioning fund and actual decommissioning cost are allowable for tax purpose whereas annual provision for decommissioning cost is a non-allowable expense.

Keywords: Decommissioning cost, decommissioning fund, oil and gas operation

Introduction

In the course of petroleum exploration and production, the industry operators do commission the installation of oil facilities (oil well and oil rig). When the oil facility fulfills its purpose and comes to the end of its useful life, it will be abandoned by the operators. At abandonment, the facility causes methane emissions thereby constituting environmental hazards. In a bid to protect the environment from hazards arising from the abandonment and retirement of oil facility, industry operators are required either by law, the terms of operating licenses or stated policy and past practice of the entity, to decommission the facility (Techera & Chandler, 2015). Decommissioning is the dismantling of oil facility and the restoration of the surrounding site to its natural state. The recent case of Aiteo's Nembe wellhead blowout in Nigeria, has brought to the fore the need to enforce the relevant laws and to ensure that companies pay remediation charges.

In Nigeria, the Petroleum Act mandates the implementation of an abandonment programme approved by the Department of Petroleum Resources for the decommissioning of any soon-to-be abandoned oil field. The guidelines for the abandonment programme and decommissioning of oil and gas facilities is further provided in the Environmental Guidelines and Standards for the Petroleum Industry in Nigeria (EGASPIN) of 1991 as revised and updated in 2002, 2016, and 2018. The Petroleum Industry Act (PIA) of 2021 builds on the existing framework by expressly

legislating the duties and responsibilities around decommissioning and abandonment. It makes extensive provisions covering the decommissioning and abandonment of petroleum wells, installations, structures, utilities, plants and pipelines, which are now regulated and supervised by the Commission or Authority as the case may be and is to be conducted in accordance with good international petroleum industry practice. The expenses incurred in decontamination, dismantlement, removal of structures and restoration of the landscape is called decommissioning costs. In other words, decommissioning cost (also known as asset retirement obligation) is the cost incurred by oil companies in reversing the modifications made to landscape when an oil facility asset is used up.

Operators are responsible for decommissioning their oil and gas facilities when they reach the end of their economic life. Decommissioning activities according to Hamzah (2003) include:

(i) Plugging and abandoning wells under the seabed. This activity is expected to form around half of total future decommissioning costs;
(ii) Removing or burying pipelines;
(iii) Removing infrastructure above and below the seabed, including the visible 'topside'. This can be dismantled into small pieces, modules or lifted in one piece and taken to shore; and
(iv) Other, smaller costs, such as onshore dismantling and recycling, and project management. There may also be long-term costs to monitor assets left in place.

There are two types of decommissioning, namely onshore and offshore decommissioning. Onshore decommissioning is uncontroversial and well covered by Nigerian law. It involves the operator plugging well bores with cement to protect ground water contamination; removal of storage tanks, wellheads, waste handling pits, processing equipment and pump jacks and making safe any exhausted or non-producing wells. By contrast, offshore decommissioning involves four distinct stages: a detailed planning process to determine the options; cessation of oil and gas, and safe plugging of the wells; removal of all or part of the installation; and disposal or recycling of the removed parts. Unlike fixed platforms, a demobilised Floating Production Storage and Offloading (FPSO) structure only requires the decommissioning of subsea equipment and pipelines; and the plugging and abandonment of wells. At present, the Nigerian offshore oil and gas industry has not reached the maturity seen in the Gulf of Mexico and the North Sea, and as a result, its fields are still in their productive phase. Therefore, no decommissioning of offshore structures has taken place (Adedayo, 2011).

In recent times, the Nigerian upstream petroleum industry witnessed significant transactions involving the sale of interests in oil licenses by the international oil companies (IOC) with long years of carrying on exploration and production activities in Nigeria, to smaller indigenous companies with limited experience in the upstream petroleum industry. For example, Shell launched divestment of its thirty per cent stake in Shell Petroleum Development Company of Nigeria Limited subsidiary. More so, Seplat Energy Plc recently acquired the entire offshore shallow water business of ExxonMobil in Nigeria for $1.28bn. Expectedly, decommissioning obligations and the potential liabilities are also transferred to the new holder of the license. Adeniyi (2017) affirmed that at the time the oil facility is transferred, the full extent of the decommissioning work to be done may not have been fully known and the accurate decommissioning cost may not have been factored into negotiations.

Professional experience with decommissioning cost of oil facility in Nigeria is limited due to the small number of abandonment of facilities. But as oil fields reach the peak of their production cycle, there are concerns that the indigenous holders of such oil facility may not be able to discharge their decommissioning obligation, given the enormous cost involved, which should be factored into the negotiation (Price Waterhouse Corper (2017). More so, investors would be interested in information about decommissioning costs to help them understand the risks posed by these costs to the company's future cash flows. Other stakeholders such as environmental groups and the public in general would also be interested in this information as it will allow them to make informed judgements about the ability of the company to clean up the environmental damage, as well as to understand the potential impact on the general public in the event that the company fails to honour obligations to decommission. It is upon this premise that this paper tends to address some issues arising from the decommissioning

costs of oil facility. Some of the matters arising are:

(i) Accounting for Decommissioning Cost
(ii) Financing Decommissioning Cost
(iii) Strategies for Minimizing Decommissioning Cost
(iv) Tax Implications of Decommissioning Cost

Accounting for Decommissioning Cost

As shown by prior literature, for example, D'Souza et al., (2000), Boatsman et al. (2000) and Khurana et al. (2001), information about decommissioning cost provisions have share valuation relevance, that is, investors use this information.

A major problem relating to decommissioning is that, whereas the obligation to decommission assets arises at the time the oil and gas assets are installed, the actual decommissioning activities are undertaken at the end of the productive life of the oil and gas assets (Khurana et al., 2001; Hamzah, 2003; Parente et al., 2006; Rogers & Atkins, 2015). This means that the actual decommissioning costs are only incurred by the company when the assets are no longer generating revenue, which could be several years after their first installation. It is in this context that existing accounting standards require oil and gas companies
to make provisions for decommissioning costs from the installation stage of the assets and to review these annually. The rationale for requiring these provisions is to ensure that adequate funds are set aside by oil and gas companies to meet such large and mounting future obligations (Luther, 1996).

As reported by the Boston Consulting Group (BCG), most companies only have 5-10% of their decommissioning cost, estimated on fully engineering studies or expert advice (Walid, 2018). It is therefore imperative to first and foremost estimate the decommissioning cost, and thereafter its accounting treatment. Since decommissioning cost is an expected future cost, its computation is surrounded by a number of uncertainties. The first step is to understand that the oil facility that is to be decommissioned was initially commissioned. Hence, the cost of commissioning is the starting point of determining decommissioning cost. In this case, commissioning cost is to be adjusted for inflation using real discount rate in order to determine its future value (i.e decommissioning cost). The real discount rate to be used is the estimated discount rate at the time of abandonment, which could be determined using time series technique (moving averages, weighted moving averages or exponential smoothing). For example, given the real discount rates for the years 2016-2022 as follow:

YEARS	RDR (%)
2016	5.1
2017	6.3
2018	8.2
2019	7.9
2020	9.0
2021	8.5

The real discount rate for year 2025, the proposed year of abandonment or retirement can be determined thus using three years moving averages

YEARS	RDR (%)
2016	5.1
2017	6.3
2018	8.2
2019	7.9
2020	9.0
2021	8.5
2022	8.5
2023	8.7
2024	8.6
2025	8.6

The future decommissioning cost shall be determined at 8.6% discount factor. Once the commissioning cost has been adjusted and an estimated future decommissioning cost is computed, the fair value, which is the present value (PV) of that estimated future decommissioning cost, shall be determined, and this serves as the decommissioning cost for the first year. Since decommissioning cost is a future cost, its report in the financial statements prior to abandonment or retirement of the facility is a mere provision; hence decommissioning cost meets the description of an asset and a provision. IAS 16 requires recognizing the initial estimate of decommissioning costs as an asset, and IAS 37 recognizes it as a liability.

Gosling (2017) states that the provision for decommissioning is effectively a sort of debt that attracts interest expense over the period. Therefore after initial recognition and measurement, in the subsequent years, the provision is built up to amount to the estimated decommissioning cost at the time of abandonment. This is done by unwinding the discounted decommissioning cost (i.e the product of discount factor and prior year provision) thereby creating accretion expense or finance cost. While the accretion expense is debited, provision for decommissioning cost is credited. The accretion expenses form part of operating expenses in the income statement while provision for decommissioning cost is reported as a liability in the statement of financial position. It should be noted also that decommissioning cost is a capital expenditure and as such, it is usually capitalized. The amortized or depreciation cost is a reduction to the asset (PPE) in the statement of financial position and also form part of operating expenses. When the actual decommissioning cost is settled at the time of abandonment, decommissioning cost is debited while cash is credited. The decommissioning cost will finally be transferred to the income statement as part of operating expenses (Walid, 2018).

Financing Decommissioning Cost

Decommissioning costs of oil facility is usually very significant. For example, the decommissioning costs for removal of 600 fixed installations and plugging and abandoning of 7,000 wells in the rapidly maturing North Sea basin is estimated at US$150 billion. According to estimates of Rystad Energy (2019) and Wood Mackenzie (2018), in 2018, a record in decommissioning and restoration obligations (D&R) was set, the costs of which amounted to 11.7 billion US dollars for the global oil and gas industry. In 2019-2021, around 32-36 billion US dollars will be spent on these commitments worldwide according to the same estimates. To ensure the financing of abandonment works, three funding alternatives are recommended in the literature (Hamzah, 2003; Parente et al., 2006; Falconer & Wicks, 2016).

In the first strategy, funding at commissioning, the company raises funds by selling a combination of stocks and bonds at the installation of the facility. The funds are segregated into a trust fund and invested in low-risk liquid assets, e.g., government bonds, where they remain and accrue interest until needed for decommissioning.

A second approach, a sinking fund, involves the gradual accumulation of funds in a trust fund. Each year the company collects additional revenues, issues additional securities, and contributes the proceeds to the trust fund. The trust therefore increases by the accrued interest as well as the annual contributions.

The third approach, funding at decommissioning, allows the company to wait until abandonment of the facility to finance decommissioning. Since the relevant oil and gas facilities are abandoned at this point, the company would have to fund the decommissioning costs from other revenue generating projects or from selling its productive assets.

Falconer and Wicks (2016) noted that it is important to realize that each of these options is designed to raise the same amount of money at the time of abandonment. This amount equals the total funding required to pay for all of the costs of placing the facility in safe storage, entombing, and/or dismantling the facility at some· time after retirement. While the nominal future value of the three funding options will be the same, the net present value will not be the same because of the different cash flow streams. Funding at commissioning will have the highest net present value, largely due to the difference between the rate of return the company can earn on an investment and the rate it must pay for borrowed funds. The return that the company must pay is higher for two reasons. First, the decommissioning fund should be invested in low-risk, lower-return assets such as government or high quality corporate bonds. Second, part (typically half) of the company's cost of capital is in common and preferred stock whose dividend payments are not tax deductible. The company will therefore have to raise more money initially because the value of the fund will decrease in real terms over time. This alternative has the lowest risk, however, because the full amount of decommissioning is always available in a liquid fund (Ibragim, Konstantin, & Anzor, 2021).

In practice, many oil and gas companies contribute to a separate fund established to help fund decommissioning and environmental obligations. Typically, a fund is separately administered by independent trustees who invest

the contributions received by the fund in a range of assets, usually debt and equity securities. The trustees determine how contributions are invested, within the constraints set by the fund's governing documents, and any applicable legislation or other regulations. The oil and gas entity then obtains reimbursement of actual decommissioning costs from the fund as they are incurred. However, the oil and gas entity may only have restricted access or no access to any surplus of assets of the fund over those used to meet eligible decommissioning costs.

Section 233 (1), of the Nigeria Petroleum Industry Act (2021) provides that "each lessee and licensee shall set up, maintain and manage a decommissioning fund held by a financial institution that is not an affiliate of the lessee or licensee, in the form of an escrow account accessible by the commission. The decommissioning and abandonment fund shall exclusively be used to pay for decommissioning and abandonment costs. Where a lessee or a licensee fails to comply with the decommissioning and abandonment plan, the decommissioning and abandonment fund shall be accessed by the commission to pay for the performance by a third party." Under the Petroleum Act, the government is liable for decommissioning offshore oil and gas assets if oil and gas companies are not able to pay for decommissioning themselves, for example due to insolvency. The risk is partly mitigated because the liability transfers in the first instance to existing partner companies operating the asset, or previous owners of the asset, and only transfers to government if no such companies exist.

Given the capital-intensive nature of oil and gas operations and the consequent requirement of funds to finance other investments, it becomes a business challenge for an oil company to leave idle its cash in a sinking fund, to support a decommissioning exercise that may be years away (Li, Richardson, & Thornton, 1997).

Strategies for Minimizing Decommissioning Cost

The magnitude of decommissioning costs in the oil and gas industry is substantial. According to Standard and Poor (2007) and Rogers and Atkins (2015), the cost for decommissioning are estimated to be equal to half of the oil and gas industry's total debt. Oil and gas 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. Some of the strategies for minimizing decommissioning cost as noted by are:

Fit – For- Purpose Design and Technologies: In a bid to minimize decommissioning cost, companies should use simple designs and technologies that are adequate in meeting the legal and technical requirement, and not complex and very expensive designs and technologies. Using dive-support vessels to remove mattresses and small subsea items weighing less than ten metric tons is complex and expensive. Such company could switch to a low-specification construction vessel with a remote salvage – specific retrieval tool. Digital twinning technology, which provides the company with an interactive up-to-date operational view of oil and gas platform and their condition by creating a mirror image of the facility to support integrity management, is proving promising in this respect.

Factory Model: A fit-for-purpose approach is not optimal for every decommissioning project. A - standardized approach—known as a "factory model"—may be more effective for P&A of simple wells, removal of small, low-complexity structures, and site remediation work. The factory model has been used by some onshore P&A operators in the US. It is potentially applicable more broadly, including to most US onshore - projects and in other onshore and offshore regions with suitable wells, structures, and sites. On appropriate projects, the factory model can help reduce decommissioning costs by at least 5%.

Decommissioning Teams: This involves building and creating dedicated and specialized decommissioning teams. Such teams enable both excellent projects and successful campaigns by ensuring that the operator has access to a strong knowledge base. Outside the Gulf of Mexico, decommissioning knowledge lies with individuals rather than organizations, because most operators have never undertaken a decommissioning project or fail to retain experienced decommissioning personnel after projects are completed. Additionally, operators find it hard to define an attractive career path for decommissioning specialists.

Some operators have implemented successful practices to retain or gain access to decommissioning specialists with the right capabilities. For example, when Total developed the Frigg Field Cessation Plan in 2003, it drew upon its experience and personnel from previous decommissioning projects: North East Frigg in 1996 and 1997, East Frigg and Lille-Frigg subsea in 2001, and the Frøy wellhead platform in 2002. The participation of experienced personnel helped Total complete the Frigg project two years ahead of schedule (Hafez, Musa, Hunt & Needham, 2015).

Innovative Contracting Model: Contracting for decommissioning projects is different from contracting for development or construction projects. By using innovative contracting approaches to take advantage of these differences, leading industry players have been able to reduce decommissioning costs by at least 5%. For example, agreement should give contractors flexibility to maximize utilization of their assets, equipment, and crews. With no "first oil" date to aim for, the deadline for completing plugging and abandonment is usually flexible. As a result, contractors can be given greater latitude on timelines for completing work, which allows them to use resources more efficiently. More so, operators can minimize the uncertainty of the project's scope by involving contractors early in the design of the technical concept and investing in front-end engineering and surveillance. Because operators have a limited amount of decommissioning experience and immature technical solutions, they should be open to contractors' insights on how to efficiently achieve the project's goals. Independent and small operators are typically more willing than large operators to partner with contractors.

Excellent Decommissioning Planning and Execution: Vast differences in decommissioning performance have been observed both offshore and onshore. Some operators are two to three times more cost efficient than others in - decommissioning. Operators can promote cost efficiency by ensuring competitive estimates and high-quality execution. Excellence in decommissioning planning and execution can help reduce decommissioning costs by at least 5%. Operators take a variety of actions to promote decommissioning excellence, such as investing in early in high-quality data that can be used to define the scope of work and challenge cost estimates. For example, an operator reduced rig time by seven days per well by gathering well integrity data before cessation of production (CoP).

Reuse of Existing Systems and Structures: Non-contaminated systems and structures may have reuse capability in other similar facilities. Therefore, the potential for reuse of existing systems and structures for some intended future application also offers a means for reducing decommissioning cost.

Cluster Decommissioning Programme: Operators typically execute decommissioning of oil facility on a standalone basis. This limits their opportunities to build and apply knowledge over a series of projects and to create efficiencies for suppliers. Decommissioning cost can be reduced through cluster decommissioning programme. With this programme, companies group together fields in proximity to each other and decommission them as a batch. Reports have shown that this strategy would bring decommission cost saving of 20% on average.

Divestment of Oil Facility: Another way to reduce costs is to divest oil facilities 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 (Ibragim, Konstantin, & Anzor, 2021).

Importing Decommissioning Skills and Resources: A wealth of international experience can be drawn upon by importing decommissioning skills and resources to reduce decommissioning cost without compromising safety. A cost-benefit analysis of importing the skills and resources should be conducted before a final decision is made.

Tax Implications of Decommissioning Cost

There are controversies surrounding taxation of decommissioning cost. While operators are responsible for decommissioning their assets, the government gives operators tax reliefs against their decommissioning costs. Tax reliefs allow operators to offset their decommissioning costs against their revenue, resulting in less of their profit being subject to tax. This can also result in the government repaying tax previously paid. Decommissioning is one example of capital expenditure incurred during business that companies can deduct from profits for tax

purposes (Abrahamson, 2014). There is a range of such allowances available across different sectors related to investment, such as in infrastructure, plant and machinery, research and development.

The Petroleum Profit Tax Act and the provisions of the Companies Income Tax Act are the enabling legislations for the taxation of oil and gas operations in Nigeria. Section 10 (1) of the Petroleum Profit Tax Act specifically states that "in computing the adjusted profits of any company for any accounting period from its petroleum operations, there shall be deducted all outgoings and expenses wholly, exclusively, and necessarily incurred, whether within or outside Nigeria, during that period by such company for the purpose of those operations. In a bid to provide some clarity on the tax treatment of decommissioning cost, the federal ministry of finance issued draft regulations on decommissioning in 2018. The major provision of the regulations is that only cash-back provision for decommissioning cost will qualify for tax deduction. In other words, the Federal Inland Revenue Service (FIRS) should not allow the annual provision for decommissioning for tax purpose.

The above regulations imply that, the Nigerian tax laws do not allow the tax deductibility of any provision/estimate for decommissioning cost, except when such an expense is set aside in a sinking fund or when actual decommissioning cost is settled. Also, companies are unable to claim capital allowances on the decommissioning provision capitalised as part of the non-current assets. Contribution to the decommissioning fund is therefore allowable for tax purpose but the finance cost recognised with respect to the unwinding the discount of the decommissioning provision is not tax deductible. More so, the provision for decommissioning cost is not tax deductible because it believed that it is a mere obligation and the decommissioning cost has not been incurred. The question is when is an expense said to be incurred? Is it when there is an obligation to pay or when actual payment is made?

The courts have generally adopted the literal meaning in the interpretation of tax statutes. This simply means that one should look at what is clearly said. There should be no room for intendment. Nothing is to be read in, nothing is to be implied. On this basis, the issue is what does "incurred" mean? The legal dictionary defines 'incur' as 'to become subject to and liable for' and 'to have liabilities imposed by Act or operation of law'. This means that expenses are only incurred when the legal obligation to pay them arises and not when the expenses have been paid for (Adeniyi, 2019).

It is therefore very clear that in Nigeria, only contribution to decommissioning fund and actual decommissioning cost are allowable for tax purpose.

Conclusion

When an oil facility has reached the end of it expected lifetime, it needs to be shut down and decommissioned in a responsible manner and in compliance with the applicable legislation and regulations. The cost incurred in conducting this process is called decommissioning cost. Since decommissioning cost is an expected future cost, an annual provision is made in reporting the cost in the financial statements of firms. IAS 16 considers the provision for decommissioning cost as capital expenditure and thus reports it as property, plant and equipment (PPE) in the statement of financial position whereas IAS 37 considers it as a liability. In the subsequent years, the provision is built up to amount to the estimated decommissioning cost at the time of abandonment thereby creating an accretion expense or finance cost, which is charged against revenue. At the time of abandonment, the actual decommissioning cost is debited to statement of income.

To secure decommissioning cost, three funding alternatives are available: funding at commissioning, sinking fund, and funding at decommissioning. The most common funding alternative is the sinking fund. Given the capital-intensive nature of oil and gas operations and the consequent requirement of funds to finance other investments, it becomes a business challenge for an oil company to leave idle its cash in a sinking fund, to support a decommissioning exercise that may be years away. It is therefore imperative to minimize decommissioning cost, and possible strategies for fit-for-purpose designs and technologies, factory model, innovative contracting model, building decommissioning teams, importing decommissioning skills and resources, excellent decommissioning planning and execution, cluster decommissioning programme, divestment of oil facility, and

potential for reusing existing systems and structures.

According to the Nigerian tax law, contribution to decommissioning fund and actual decommissioning cost are allowable for tax purpose whereas annual provision for decommissioning cost is a non-allowable expense. This implies that the Nigerian tax system does not provide enough incentives for optimising the impact of decommissioning costs on companies operating in the oil and gas industry. However, the lack of tax relief for provision for decommissioning cost in Nigeria could successfully be challenged in court as the draft regulations on decommissioning is inconsistent with the enabling Act and therefore null and void. In 2004 there was a case between Shell Norway v Ministry of Finance & Others, the Norwegian Supreme court held that provisions made in the 1995 and 1996 financial statements in respect of decommissioning costs were incurred and therefore allowable for tax even if the decommissioning process itself had not commenced. To safeguard herself from possible litigation, the Nigerian government can as well review the draft regulations on decommissioning to include a section that "obligation to pay" is disregarded.

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