



Oil & Gas Intelligence Report

FINANCING INSTRUMENTS IN THE UPSTREAM SECTOR

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INTRODUCTION

Upstream Financing Instruments

From 2017 to 2040, the total investment needs in the Oil & Gas (O&G) sector are estimated to exceed US\$20 trillion globally, according to the International Energy Agency (IEA).¹ During this period, total upstream economic activity is expected to top US\$15 trillion, equating to roughly US\$640 billion per year.

The immense amount of financing that flows from capital markets to the O&G sector is likely to retain many of the same characteristics that are prevalent today: individual capital-intensive projects, long periods of investment maturity, high technical and geological uncertainty, political risks, considerable competition among companies in the sector and among different sources of energy, environmental problems, etc.

It would be complicated and tedious to make an exhaustive list of the different financing instruments available to the O&G industry, as the mechanisms of lending money and sourcing capital with various durations and uses are increasing and have become more sophisticated since the mid-20th century. Because the upstream sector is expected to account for approximately 75% of the O&G financing,² this report will focus on analyzing and discussing the primary financing options employed within this sector. These options vary depending on which phase of the Exploration & Production (E&P) stage the project is in, as the exploration phase is usually covered with equity or resources from partners, while a diverse range of financing instruments are available at the development and production stages.

Two broad categories of financing instruments can be distinguished:

1. Instruments mainly developed in the O&G sector, based on the very nature of the O&G business
2. General financing instruments used in the O&G sector but also used in other sectors



1, 2. International Energy Agency (2017), "World Energy Outlook," Chapter 3.

With regard to the first category, three main types of financing will be discussed: reserve-based lending, volumetric production payments and financing mechanisms with “carry” between the partners involved in E&P contracts.

Within the second category, common financing sources include equity financing, bonds, mezzanine financing (with equity participation) and Islamic financing.

Obviously, the list is by no means exhaustive, as there are also hybrid forms of financing that combine various elements and for which there is no clear and standard lexicon that defines the terms of the instruments in the same way.

An example of financing schemes with many instruments is the case of integrated liquefied natural gas (LNG); that is, LNG projects covering the full chain of upstream production, LNG facilities and transport. These highly capital-intensive projects often involve a joint venture between a national oil company (NOC) and independent oil companies (IOCs). The financial structure includes a package of equities, bonds and loans granted by private financial entities, multilateral banks and government agencies.

An entire separate volume could be prepared on the evolving role and form of federal and local government incentives critical to sustained O&G industry investment. This report focuses on the primary funding options available for the balance of the funding requirements.

Figure 1: Phases in field life cycle

Phase 1	Phase 2	Phase 3	Phase 4	Phase 5
Discovery	Reserve Appraisal	Field Development	Production	Decommissioning
Phases duration: 5-10 years		Phases duration: 20-30 years		
Main Financing Instruments				
<ul style="list-style-type: none"> ▪ Equities ▪ Sponsor loans ▪ Farm-ins 		<ul style="list-style-type: none"> ▪ Equities ▪ Bonds ▪ RBL ▪ Mezzanine and project finance ▪ Farm-ins 	<ul style="list-style-type: none"> ▪ Traditional bank loans ▪ RBL ▪ VPP ▪ Mezzanine ▪ Equity kicker ▪ Cash flow from production 	
Negative Cumulative Cash Flow			Positive Cumulative Cash Flow	

Table footnotes: Data is purely illustrative. Farm-ins may also take place in the Production phase, although with less frequency. RBL in the Development phase mainly refers to countries other than the U.S. Different sorts of bonds and equity emissions can be publicly or privately placed.

Financing Instruments Characterizing the O&G Sector

RESERVE-BASED LENDING (RBL)

RBL is a type of asset-based financing where the value of the underlying reserves determines the amount of money loaned. Ultimately, the cash flows generated from those reserves are used for the repayment of the loan. In addition, reserves of other fields belonging to the borrower can be used as complementary support.³

RBL, like conventional non-asset-based lending, can take the form of a (revolving) credit facility or a term loan. The revolving credit facility is more common, as it provides the borrower with more flexibility to withdraw money and pay interest and principal along the loan life, a necessary flexibility when there is uncertainty about the development deadlines of the field or the need for additional funding to capitalize on upsides within the reserves. Revolving credit facilities adjust better to field life cycle liquidity necessities due to the possibility of re-borrowing a loan that has been repaid. Term loans are most commonly used to fund a portfolio of operating assets, often new exploration and development activities. The term of the loan is usually between 1 and 7 years, and more than one lender frequently participates in the form of a group or lending syndicate.

RBL at the international level require lenders to possess extensive knowledge related to the volume and profile of the reserves; the O&G production and commercialization strategies and risks; and the experience, know-how and reliability of the field operators. Reports of independent expert reserve valuers are often obtained at least annually, as these reserves represent the primary collateral. Once the volume of the reserves is estimated, its net present value (NPV) is calculated by applying a forward price curve for hydrocarbons, with a given discount rate, to the production profile corresponding to that volume. From the calculation of the present value of the reserves (net of costs), the “borrowing base” of the RBL is defined, which is the monetary base that determines the maximum amount available to the credit facility. This base will change throughout the life of the asset, varying based on the price outlook, decreasing as reserves are depleted throughout the production phase and increasing as new reserves are added to the base (from the same field or others).

In the U.S., banks establish the “borrowing base” based on a percentage of proved reserves. This typically includes the entire amount of the proved developed producing (PDP) reserves as well as a certain percentage of the remaining proved classification, such as proved developed not-producing (PDNP) reserves, normally in the range of 50% to 75%, and to a lesser extent proved undeveloped (PUD) reserves in the range of 25% to 50%. The probable and possible reserves do not usually count toward the borrowing base.

3. See Fox, J., Gonsoulin, D. and Price, K. (2014), “Reserve based finance: A tale of two markets,” Oil & Gas Financial Journal (January, February, March); Price, K. (2012), “Reserve-based lending markets: From projects to borrowing bases,” Oil & Gas Financial Journal (November); Marek, M. and Wilson, R. (2014), “A future for reserve-based lending in energy markets? Limitation of the traditional model,” Texas Journal of Oil, Gas and Energy Law, vol. 10-1; Jansen, P. F. (2017), “Reserve-based lending: The evolution through the downturn,” Oil & Gas Financial Journal (May).

In global markets, the computation of the borrowing base uses a larger spectrum, encompassing not only reserves of producing fields but also the total proven and probable reserves in nonproducing fields. In RBL contracts it is normal to limit the duration of the loan, using the “reserve tail” criteria to provide security to the lender. The reserve tail is calculated as the percentage of remaining reserves over the totality of ultimate reserves. When the defined reserve tail, usually 25%, is reached, the balance of the principal must be repaid.

Figure 2: Main covenants in RBL contracts

<p>1. Reports and information requirements (i.e., reserve and production reports, budgets, capital expenditure [capex] and operating expenditure [opex] planning, fiscal and legal documentation)</p>
<p>2. Covenants on financial ratios such as:</p> <ul style="list-style-type: none"> ▪ Leverage ratios: funded debt to earnings before interest, taxes, depreciation and amortization (EBITDA) and funded debt to capital ▪ Debt service coverage: operating revenues to liabilities coming in the same period ▪ Interest cover ratio: EBITDA to interest payments ▪ Capex threshold: limits to incur in capex ▪ Current assets to current liabilities
<p>3. Other covenants and controls include:</p> <ul style="list-style-type: none"> ▪ Controls on liquidity: anti- borrowing and anti-cash hoarding provisions ▪ Restrictions on third-party debt to control the raising of funds from third parties ▪ Limits on hedging to avoid “over-hedges” of volumes in periods of decreasing prices or production ▪ Banking accounts control ▪ Limits on recruitment and personnel expenses

RBL began to be used as financing mechanism in the U.S. O&G industry in the mid-20th century in Texas’ fields, using reserves or the field itself as a credit mortgage. In U.S. legislation regarding mineral rights, landowners own all minerals contained below the surface of the property. This allows the RBL to set a security mortgage so that if the credit is not returned, the property of reserves that covers the guarantee of the mortgage transfers to the lender via a bankruptcy process. These RBL contracts were mainly dedicated to financing the needs of fields already in production.

Figure 3: Steps in the calculation of RBL borrowing base amount

1. Estimation of the hydrocarbons volume of reserves in the field*
2. Estimation of expected production flow during the project life according to the reserves volume and characteristics of the reservoir
3. Costs estimation of the expected production flow
4. Assumption about hydrocarbon prices during the project life and definition of the discount rate
5. Calculation of the field NPV from the above data
6. Calculation of the Borrowing Base Amount (BBA): Two procedures may be distinguished, one mainly referring to the U.S. and the other referring to international markets other than the U.S.
<ul style="list-style-type: none"> ▪ Traditional U.S.: Each bank has its own methodology, linking the BBA to the NPV of proven reserves and adjusting “risk factors” for fixing the weighting parameters of PDP, PDNP and PUD.* ▪ International markets other than the U.S.: BBA is frequently based on the Project Life Cover Ratio (PLCR) and Loan Life Cover Ratio (LLCR).** BBA will be fixed as the minimum value obtained by dividing project life by PLCR and loan life by LLCR.
<p>Notes: *In the U.S. it is a common practice to classify proved reserves into PDP, PDNP and PUD reserves. The percentage used in RBL practice for fixing the total volume of reserves is 100% of PDP, 50% to 75% of PDNP and 25% to 50% of PUD.</p> <p>**Standard value of the ratios is set around 1.5 for PLCR and 1.3 for LLCR but may substantially differ according to country and type of project.</p>

In Great Britain, RBL began to be used as a financial instrument in the early 1970s to facilitate the development of fields in the North Sea. In contrast to the U.S., the reserves cannot be constituted as a “mortgage,” since Great Britain legislation establishes that reserves are owned by the sovereign until the moment the hydrocarbon is extracted. RBL was established in Great Britain as “project financing,” where lenders agreed to grant credit based on the estimated cash flows from the North Sea fields according to development and production plans drawn up by promoters and approved by the government. In these cases, RBL is not available during the exploration phase of the field but can be obtained when proven reserves exist, even if there is no production yet.

When the borrower has a portfolio of oil fields, the RBL “borrowing base” is calculated with the cash flow of the set of all reserves, which allows the lender to diversify its risk and the borrower to fund its exploration and development activities.

The international RBL market has developed, albeit somewhat slowly, based on the Great Britain model, while the U.S. approach has been critical to the shale proliferation but has not expanded into other global markets. There are some factors that explain the slow expansion of international RBL granted by banks. First, there is a high amount of sovereign risk in many oil-producing countries. Specifically, factors such as political risk, regulatory and fiscal risks, and production constraints linked to Organization of the Petroleum Exporting Countries (OPEC) quotas create lender uncertainty. Potentially more significant is the fact that, in addition to not being able to legally own the underlying reserves, the possibility of carrying out “farm-outs” and transfers of stakes or production rights of contracts is limited in many countries by administrative authorizations and complex bureaucratic procedures.

RBL is widely used by small and medium-sized oil companies because larger companies generally have financing mechanisms that cost less, given their strong balance sheet and easy access to the capital markets for bond and share issuances as well as conventional bank lending.

Here are some recent examples of RBL:

- In October 2016, Tullow announced the agreement of its RBL's "borrowing base" with the banks, allowing it to maintain its available credit of US\$3.3 billion and increase the RBL by US\$345 million in 2017 to finance its E&P development projects in Africa.
- In February 2017, SandRidge refinanced its RBL to US\$600 million (from a "borrowing base" of US\$425 million) for 3 years, improving the terms of the agreement.
- In April 2017, Chrysaor agreed to a US\$1.5 billion RBL with a syndicate of banks for the purchase of a portfolio of Royal Dutch Shell blocks in the North Sea. The total value of the transaction is around US\$3 billion, and the estimated Proved plus Probable (2P) reserves are 350 million barrels.

VOLUMETRIC PRODUCTION PAYMENTS (VPPS)

The VPP is a financial device which allows companies with E&P assets to obtain funds by monetizing part of the value of the crude/gas reserves before extraction. Specifically, it is an agreement by which the seller of the VPP (the producer company) is committed to deliver, for a certain period, a given volume of hydrocarbons coming from one or several oil fields to the purchaser of the VPP in exchange for the payment of an up-front amount. The value of the VPP volume is the NPV of a given flow of production, applying a forward price curve during the agreed period.⁴

The VPP seller obtains funds from inception, which then can be used in working capital or capital expenditures to develop the oil field. These funds are reflected in the balance sheet as advance income (which will be amortized as hydrocarbons are delivered) and not as financial debt. The acquirer of the VPP assumes the risk of reserves, meaning that the reserves to be produced in the future may not fully cover the totality of the production bought in advance, either because the reserves do not have the initially estimated volume or due to causes beyond the control of the operator. Therefore, to mitigate the risk, the VPP acquirer must perform a rigorous analysis of the reserves, engaging expert external evaluators; assess the technical abilities and experience of the operator; and set the percentage of the contracted production in a conservative manner, limiting it to proven reserves and, if possible, including production of several fields.

The purchaser of the VPP also absorbs commodity price risk related to the prepurchased reserves, as the ultimate sale price of the hydrocarbons upon delivery may be below the VPP purchase price. To mitigate such risk, the VPP buyer may buy insurance through price hedging arrangements. As VPP buyers are often financial institutions or trading businesses, they typically have both the credit ratings and trading capability to cost-effectively enter into hedging contracts.

VPP arrangements are also a U.S. financing mechanism, as they also are predicated on the aforementioned legislation that allows private ownership of the reserves in the ground. This allows the VPP in the U.S. to be treated, during the agreed term, as an overriding royalty devised as an interest on real property. In most other countries, underground reserves belong to the sovereign, making it more difficult for lenders to take asset-level security.

4. See Muñoz, J. (2004), "Financing oil and gas transactions," Texas Journal of Oil, Gas and Energy Law, vol. 4; Culp, C. and Forrester, J. P. (2010), "Structured financing techniques in oil and gas project finance," Chapter 11 of "Energy and Environmental Project Finance Law and Taxation. New Investment Techniques," edited by Kramer, A. and Fusaro, A, Oxford University Press; Marek, M. and Wilson, R. (2014), op. cit.

The development of a VPP agreement usually follows the following steps:

- The E&P company, which owns the reserves, agrees with a financial entity to an advance sale of hydrocarbons, receiving an up-front payment. In return for this payment, the E&P company agrees to deliver an agreed amount of hydrocarbon over a period of time.
- The financial entity sells the rights to the hydrocarbon flow to a commercialization company (which may be from the same group), which will be responsible for trading the received production in the market. The financial entity will receive a variable flow of income that will depend on the crude price.
- The financial entity may enter into a swap agreement with another entity by which they agree to exchange variable income for fixed flows of funds.
- Lastly, the financial entity may issue bonds in the capital market. The fixed flow of funds received by the entity in the swap agreement may be used as collateral in the bond issue. The bond holders finance the VPP transaction thereafter.

From a transaction perspective, if a company acquires reserves from another company when a portion of these reserves are subject to a VPP agreement with a third party, the acquiring company will pay for the transaction of the assets' value, net of the VPP value. It will account its net asset value as cost of acquisition, and the updated costs of its production, not including in its booking of reserves those subject to VPP, as the value of the VPP.

The VPP structure was initially created to fund the U.S. mining sector, but it has transitioned into hydrocarbons as shale production reversed decades of U.S. O&G production declines. Some important examples of VPP operations follow:

- In 2003, the U.S. company Apache entered VPP agreements to buy E&P assets by acquiring several production fields from Shell in the Gulf of Mexico for US\$200 million. Because Shell had previously sold a VPP contract to Morgan Stanley worth US\$300 million in exchange for production from these fields, the total market value of those assets equaled US\$500 million.
- In 2004, Apache repeated the same financing scheme when acquiring oil fields in the Gulf of Mexico from Anadarko for US\$537 million. Earlier, Anadarko had sold VPP agreements of those fields to Morgan Stanley for US\$775 million. Thus the total market value of those assets equaled \$1.3 billion.
- The U.S. gas company Chesapeake has been very active in VPP transactions since 2007, having sold in advance almost US\$6 billion of its U.S. natural gas production. The largest VPP arrangements were made with Barclays (US\$1.15 billion in 2010 and US\$850 million in 2011).

“CARRYING” FINANCING BETWEEN PARTNERS IN E&P CONTRACTS

Companies with E&P contracts, under the modalities of concessions or Production Sharing Contracts (PSCs), will often sell an interest ownership in the contracts (working interest) to other companies in exchange for a particular up-front payment or a combination of an up-front payment with a financial carry in the field's future expenses. This carry implies that the new partner agrees to finance part of the future expenses committed by the company entitled to the contract with the government of the producing country.

When the percentage of the expenses to be paid by the new partner exceeds the percentage of its working interest, the new partner is deemed to be financially “carrying” the incumbent company.

PSCs generally contain some legal obligations for the E&P company regarding the need to make heavy expenditures in exploration activities and, in the case of discovery of reserves, additional investments to develop the field. The direct sale or transfer of working interest in exchange for a certain carry implies the selling company will be able to share those future commitments, therefore decreasing its financial exposure. The contractual commitments with the government of the oil-producing nation become a shared responsibility of both companies, which sign a Joint Operating Agreement (JOA) establishing the rules between them in running the operations.

The financial carry for the new partner (excess of expense-bearing interest over its working interest) usually covers activities in the exploration phase of the E&P contract. In many oil-producing countries, when the company offering the transfer of working interest is the NOC, it is common practice to demand a financial carry of all its expenditure obligations in the exploration phase as compensation, meaning the new company undertakes 100% of the exploration risks. Furthermore, sometimes the financial carry extends to part of the costs needed for the future development phase. In case of an unsuccessful exploration result, the NOC will not be impacted.⁵

5. See Johnston, D. (2003), “International Exploration Economics, Risk and Contract Analysis,” Penwell, chapter 2 and pages 332-333 and 368.

General Financing Instruments

EQUITY FINANCING

Turning to the equity markets to raise financing through issuance of stock is a standard form of financing and can be achieved by issuing either common or preferred stocks. Preferred stocks establish some special conditions in relation to the common stocks, which usually imply a minimum mandatory dividend and a higher priority over the ordinary stocks in case of bankruptcy.

The equity can be issued from the parent company or from a subsidiary. It is common for a subsidiary to host the E&P assets with the purpose of keeping them separate from the rest of the group's assets. A common way the subsidiary isolates the financial risks inherent to the upstream industry is through a special purpose vehicle (SPV), which is an independent legal entity. When an E&P project is financed through project finance, whereby the collaterals of the financing are the cash flows of the project, the SPV allows the sponsor to maintain the project assets isolated from the rest of the sponsor's assets.

In E&P project finance, lenders may require a minimum equity provision from the sponsors, establishing upper limits on the leverage ratio to reduce financial risk. A standard minimum required provision of equity is 30% of financial needs.

The placement of shares can be achieved through public offer in the equity markets or through private placements, seeking one or several investors that may pursue above-average profitability or provide specific capabilities to the issuing company. An example is financing through private equity, which allows the private equity firm to take significant stakes in E&P companies' capital, making its investment decisions after a thorough analysis of the company's management team and its ability to create value.

A recent example of an issuance of common stocks for the financing of an acquisition is the case of Total, which in August 2017 agreed to purchase Maersk Oil for US\$7.45 billion. Total announced its intention to fund the transaction by issuing 97.5 million stocks (US\$49.5 billion) and assuming all of Maersk Oil's debt.

BOND ISSUANCES

The issuance of bonds, also placed in the open market or in private placements, constitutes a traditional source of financing for the O&G sector. The terms of the issuance differ substantially among oil companies, depending mainly on whether they have an investment grade rating or not.

Speculative-grade rated companies are generally small to medium-sized firms with few reserves and low vertical integration. These companies frequently issue bonds as "high yields" (popularly named "junk bonds"), as the bondholders require a premium yield to accept an increased risk. The high-yield (HY) oil bond market is highly developed in the U.S. and is gradually growing internationally.

6. See U.S. Energy Information Administration (2016), "Stable oil prices, improving credit conditions contributing to rise in M&A activities," This Week in Petroleum, November.

HY bonds are very sensitive to fluctuations in the price of oil, and in the case of the U.S. they are closely linked to the evolution of shale oil and gas. Between 2014 and the first quarter of 2016, with the sharp drop in the price of West Texas Intermediate (WTI) (from US\$100/bpd to less than US\$30/bpd), the spread of HY bonds issued by U.S. oil companies increased by more than 1,300 basis points (bps). Since the second quarter of 2016, the WTI has tended to stabilize at around US\$50/bpd, and the situation in the HY oil bonds market has improved regarding volatility levels and spreads. With the current price level, many E&P companies have returned to profitability, increasing their exploration and development expenditures. Investors are recovering confidence in the O&G sector's ability to pay timely interest and principal of bonds.

HY bonds, which typically have maturities between 5 and 7 years, are a relevant source of financing, which complements RBL and other alternative instruments. In the U.S., the HY bond market is a liquid, transparent and deep market. Even though HY bonds have a high risk, the greater profits attract a large source of investors. The growing expansion of this market internationally makes HY bonds attractive to E&P companies that have difficulty accessing conventional capital markets, especially small and medium-sized companies.

A recent example of a large issuance of bonds by an investment-grade company occurred in March 2016, when ExxonMobil issued US\$12 billion in bonds in different tranches to finance new investments. The first tranche was US\$2.5 billion for 30 years at 4.11% (a spread of 150 bps on comparable U.S. government bonds). The 10-year tranche of US\$2.5 billion was placed at 3.04% (130 bps more than comparable debt). In March 2016, the energy HY bond spread index in the U.S. reached its maximum value of the year, about 10 times higher than ExxonMobil bonds.

MEZZANINE FINANCING WITH EQUITY PARTICIPATION

Mezzanine loans for O&G are mainly used in the U.S. Mezzanine is a type of hybrid debt with a risk level between equity and senior debt; loans are less risky than equity but riskier than senior debt. As a result, they are costlier for the borrower. Higher risks associated with mezzanine debt as compared to senior debt are typically linked to the lower level of loan security backing. This often relates to inadequate proven reserves or sponsor collateral assets.

Mezzanine loans are generally used in the development stage of an E&P project. They cover the financial needs of companies that do not yet have production or enough proven reserves to access a lower cost RBL facility and cannot access conventional corporate debt markets due to low EBITDA or few assets to secure the loan. To obtain mezzanine financing, borrowers must provide in-depth information about the project's financial and operational issues, and accept strict covenant packages and tight monitoring control on proceeds, accounts and operations.

Mezzanine financing can take multiple forms and can be applied to several types of projects. On many occasions, it is structured as a bridge loan until the project is developed and has access to a senior loan.

7. See Muñoz, J. (2004), op. cit.; Weisser, F., Johnson, S., Taylor, D. and Lynn Bass, M. (2006), "A tool for growth: Fundamentals of mezzanine finance," Oil & Gas Financial Journal, 1 August; Marek, M. and Wilson, R. (2014), op. cit.; Sheehan, C. (2017), "Mezzanine moves," Oil & Gas Investor, 26 September.

Mezzanine financing in the U.S. is mainly granted by private equity and other HY lenders who specialize in financing O&G development activities. Mezzanine financing is occasionally granted by a commercial bank, but it is usually as a complement to RBL: an RBL first tranche based on PDP reserves and a second tranche of mezzanine financing to develop new reserves (a tranche that can join the RBL when new reserves become PDP). An example of this hybrid financing that includes mezzanine is the case of the Irish company Petroceltic, which in 2013 secured a US\$500 million 5-year loan from a syndicate of international banks with two tranches: a first RBL US\$375 million tranche with its reserves in Egypt and Bulgaria as the collateral, and a second mezzanine tranche of US\$125 million to appraise new reserves in Algeria and construct the facilities of an E&P field.

Frequently, mezzanine financing in the U.S. implies, in addition to credit interest, a stake either in the income generated or in the ownership of the asset to be financed. Thus, the mezzanine financier secures an extra return in exchange for the considerable risk it incurs through equity participation. This extra return paid by the borrower based on the profitability or the higher value of the asset is called an “equity kicker transaction.” It can take different forms, but the most common is either a percentage of the production or a warrant on shares (instruments that give the lender the option to convert them into some shares at a given time).

Examples of equity kicker transactions include the agreements made by Chesapeake Energy in 2012 to sell preferred shares of affiliated companies, with a payment of an annual fixed dividend and an “overriding royalty interest” on the production of several fields. The sales provided funding to Chesapeake for US\$2.5 billion to develop fields in Ohio and Oklahoma from notable investor groups, including EIG and GSO Capital Partners.

Another example of an equity kicker is the securities purchase between EIG and Plains Exploration and Production in 2011. Plains Exploration and Production received US\$450 million in exchange for a 20% equity interest in its subsidiary, Plains Offshore, to develop an offshore field in the Gulf of Mexico. Plains Exploration and Production sold EIG convertible preferred stock with fixed dividends and nondetachable warrants.

ISLAMIC FINANCE

Islamic financing consists of different funding instruments compliant with Sharia principles or Islamic law, following the precepts of the Quran. One of these precepts establishes the prohibition of earning fixed interest for lending money, so compensation for money lending must be structured as a share of the profits generated by the financed asset. The global volume of Sharia-compliant funds is growing throughout Africa and Asia, as well as in traditional OPEC member countries. Loans are based on tangible assets, linking financial risk to the value of the underlying asset.

8. See Richardson, C.F. (2006), “Islamic finance opportunities in the oil and gas sector: An introduction to an emerging field,” *Texas International Law Journal*, vol. 42; Garrido, I., Menendez, M. and Moreno, P. (2016), “Islamic finance: Development and outlook,” *Bank of Spain Economic Bulletin*, October; Standards & Poor’s Ratings Services (2016), “Islamic Finance Outlook,” McGraw Hill Financial.

Islamic financing arrangements can take many forms, but can be grouped into two main structures:

- Contracts based on a sale-and-buyback agreement of an asset, determining a margin in the transaction. The sale can be structured as a normal sale or lease. The margin is the profit that replaces the interest.
- Contracts based on the share of the resulting net income of the projects, where the bank contributes capital to and participates in the profits generated in a way in which the risk is shared between both parties. There are several ways in which the partnership can be established, but in all of them the bank shares the financial risks with the borrower.

In addition to bank borrowing, Islamic finance contemplates issuance of bonds (“sukuks”), which can also be structured according to the aforementioned schemes. Sukuks, like Sharia-compliant lending structures, are gaining considerable volume internationally.

While Islamic finance has seen minimal use in the O&G sector historically, it is widely expected that it will be a major source of financing in the future as private development of hydrocarbons accelerates in countries observing Muslim law. These options represent an attractive source of financing for medium and small players, although legal restrictions remain in many countries that limit use of Islamic finance.

Some examples of Islamic financing in specific projects follow:

- Dolphin Energy (Mubadala, Total and Occidental) finished the construction of a gas pipeline connecting the North Field (Qatar) with Abu Dhabi in 2006. Out of the US\$3.45 billion borrowed, US\$1 billion was structured through Islamic contracts subscribed by a consortium of 14 banks.
- PETRONAS issued US\$1.25 billion of sukuk bonds in 2015, with a profit rate of 2.7%. The sukuk included taking a stake in the property of several units of a PETRONAS Group refinery.
- The U.S. company East Cameron Partners issued US\$1.67 billion of sukuk bonds in 2006 in which bondholders were awarded rights over production (known as “overriding royalty interest”) of two gas fields off the coast of Louisiana. These rights were structured through an SPV, which acted as a trustee for the bondholders. In 2008, East Cameron went bankrupt and filed for Chapter 11. In the legal case between the parties, a judge resolved that the transfer of royalty interest in the sukuk had the characteristics of a true sale and not those of a simple secured loan. The case was settled through negotiation.

9. See the East Cameron case study at <https://islamicbanker.com/education/east-america-partners%E2%80%99-sukuk>.

Figure 4: Advantages and disadvantages of financial tools in an E&P company

Financial Tools	Advantages	Disadvantages
RBL	<ul style="list-style-type: none"> ▪ Suitable for companies with reserves but poor access to conventional loans ▪ Flexibility in fund withdrawals and refinancing revolving facilities ▪ Flexibility to combine “second lien” junior debt (mezzanine or corporate loans) ▪ Large banking pool of funds for RBL ▪ May cover development phase of projects, mainly outside U.S. 	<ul style="list-style-type: none"> ▪ BBA is highly sensitive to oil price ▪ Mortgages on reserves property, usually in U.S. ▪ Uncertainty about BBA future redetermination outcomes ▪ In U.S., funds limited to PDP reserves
VPP	<ul style="list-style-type: none"> ▪ VPP seller maintains operational control of production, including VPP volumes ▪ Reserves and price risks run by VPP buyer ▪ Full upfront payment from buyer ▪ VPP proceeds not accounted as financial debt 	<ul style="list-style-type: none"> ▪ VPP market may shrink when price volatility increases ▪ Difficult to implement in countries where private property of reserves is not allowed
Carry	<ul style="list-style-type: none"> ▪ Reduction in financial exposure for the company receiving carry ▪ Farm-in allows possibility of new partners with strong technical expertise ▪ Allows share of risk in exploration 	<ul style="list-style-type: none"> ▪ Many producing countries impose severe bureaucratic controls and high taxes on farm-outs
Bonds	<ul style="list-style-type: none"> ▪ Fewer covenants than in loans ▪ Many possible structures (i.e., fixed vs. floating rates, ordinary vs. convertibles) ▪ Typically longer term than loan financing ▪ Broad possibility of market placements ▪ HY bond markets enable funds for speculative-grade rated O&G companies 	<ul style="list-style-type: none"> ▪ HY bond returns are highly sensitive to oil price ▪ High-interest costs of HY bonds ▪ Low development of international HY O&G bond market bar a few countries
Equity	<ul style="list-style-type: none"> ▪ Suitable financing tool for exploration activities ▪ Wide range of issuing alternatives (i.e., public and private placements, ordinary and preferred stocks) ▪ Long-term engagement of equity investors 	<ul style="list-style-type: none"> ▪ Riskier than other sources of finance in case of bankruptcy ▪ New share issues dilute the equity ▪ New shareholders may impose tight monetary supervision
Mezzanine	<ul style="list-style-type: none"> ▪ Allows finance of development projects for small and mid-sized nonproducing companies ▪ Large market in U.S. with specialized entities ▪ May act as a “bridge” loan to facilitate transition to senior debt ▪ Flexibility in withdrawals and refinancing 	<ol style="list-style-type: none"> 1. Expensive and highly covenanted 2. Controls on borrower’s accounts and field operation may be tight 3. In case of equity kicker, there may be a dilution of the company’s equity 4. Designed through preferred stocks
Islamic	<ul style="list-style-type: none"> ▪ Access to new worldwide liquidity sources in strong expansion ▪ Large set of financial instruments compatible with Sharia law 	<ul style="list-style-type: none"> ▪ Uncertainty due to lack of Islamic finance legislation in many countries

Conclusions on Financing Instruments

O&G companies with strong balance sheets typically finance their E&P activities with conventional tools (e.g., corporate loans, equity and bonds) that typically result in the lowest overall cost of capital. Small and mid-sized companies with low EBITDA and few proven, producing hydrocarbon reserves require limited/nonrecourse financing due to the difficulty of accessing conventional financial tools. Their small levels of production or their short exploration experience indicates the need for financial tools that cover the gap between equity and senior debt.

When a company reaches the production phase (once the development phase of the field has been completed), or when it holds proven reserves that are soon coming into production, RBL and VPP are suitable financial instruments. The traditional U.S. RBL model, which includes credit-revolving facilities or term loans, has been used by companies that are already producing reserves, while RBL in other parts of the world has focused more on promoting field development projects based on proven and not developed or even 2P reserves. VPP is a kind of term-overriding royalty interest in one or several O&G fields that provides the E&P company with upfront proceeds for financing working capital or capital expenditures. Once the VPP is granted, the reserve risk and the price risks are assumed by the holder.

The need for field development finance by small and mid-sized companies, primarily in the U.S., has been partly covered by mezzanine loans, a financing structure that stands between bank senior debt and equity. Besides including a loan, the mezzanine formula has often involved an equity kicker transaction, which amounts to an interest share in net profits or in equity to the sponsor project as a way to compensate lenders for the high risk they incur. However, while mezzanine financing has experienced strong growth in the past few decades, the high cost of the debt and tight covenants have limited its attractiveness.

O&G HY bonds also have proven to be a major financial instrument for small and mid-sized companies with a speculative-grade credit rating, despite the high return required by investors. HY bonds have rapidly expanded in the U.S. and of late in some other countries. Their long maturities and few covenants (compared to loans) make them suitable for mid-sized companies. However, the high sensitivity of their returns to oil prices considerably limits their appeal in times of decreasing oil prices.

Islamic finance of O&G projects has expanded rapidly over the past few years. Islamic finance includes many different financial structures, all compliant with Sharia law, where credit interest is replaced by capital gains and net income sharing. Given the magnitude of hydrocarbon reserves within countries observing Sharia law, it is likely that Islamic finance will fill an increasing portion of the \$20 trillion capital needed in the O&G industry over the next two decades.

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Duff & Phelps Oil & Gas Solutions

The Duff & Phelps Oil & Gas group possesses a unique set of capabilities derived from our professionals' prior experience as management consultants, investment bankers and engineers. We translate such former experience into a deep understanding of the values and drivers of the global industry, particularly National Oil Companies. Our team leverages its long-lasting relationships across industry players to create tailor-made solutions in complex situations for our clients. This approach has allowed us to be a valued advisor on both sides of the deal. Our services include:

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- Optimized cost allocation
- Joint venture analysis
- Contract due diligence
- Acquisition or vendor due diligence

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- Valuation of blocks
- Valuation of business
- Valuation of working interest in a joint venture
- Valuation in a migration context
- Valuation of contracts
- Valuation of tax schemes
- Valuation of common shares

Mergers and Acquisitions

- Non-core business units divestment
- Management Buy-out and Management Buy-in
- Development of negotiation frameworks
- Screening of potential investors looking for Oil & Gas opportunities

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- Loan covenant review
- Risk modeling
- Analysis of loan portfolio
- Collateral analysis
- Securitization
- Project finance

Strategic Advisory

- Design of fiscal schemes
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- Expertise in privatization processes
- Advisory on transitions from fossil fuels to renewable energies

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