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COMPARISON OF HOST GOVERNMENT PETROLEUM CONTRACTS AND APPLICABILITY FOR TURKEY DEEPWATER OFFSHORE LICENCES

A THESIS SUBMITTED TO
THE GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES
OF
MIDDLE EAST TECHNICAL UNIVERSITY

BY

FATİH VURAL

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FOR
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IN
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MAY 2021

Approval of the thesis:

COMPARISON OF HOST GOVERNMENT PETROLEUM CONTRACTS AND APPLICABILITY FOR TURKEY DEEPWATER OFFSHORE LICENCES

submitted by **FATİH VURAL** in partial fulfillment of the requirements for the degree of **Master of Science** i**n Petroleum and Natural Gas Engineering, Middle East Technical University** by,

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ABSTRACT

COMPARISON OF HOST GOVERNMENT PETROLEUM CONTRACTS AND APPLICABILITY FOR TURKEY DEEPWATER OFFSHORE LICENCES

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In the boundaries of sovereign nations, which has a legal dominion over of its geographical area, including natural resources, the vast majority of the World's energy sources are developed. If a country opens the resources for exploration and development which is referred to host country and the agreements signed between host country and National Oil Company (NOC), private companies or any combination of them to explore and/or develop petroleum licences are called as host government petroleum contract.

The fiscal system of host government contract is expected to encourage exploration and development activities, allow special incentives for some challenge fields and enable to provide fair sharing of economical incomes for Host Countries (HC) and International Oil Companies (IOCs).

Especially, expenditures and risk factors are very high for deepwater operations during exploration and development phases until reaching first commercial production for Operator that might be HC only, JV or an IOC. Therefore petroleum law, regulations, host government contracts and tender strategy should be arranged by considering items: geology (prospectivity of field, reserves, productivity and HC quality and type "gas or oil"), political stability of HC and abroad, legal system,

fiscal system, transparency, market conditions and operational challenges. Deepwater Offshore Operations are the most challenge ones in exploration and also production stages. In order to start and continue such deepwater projects, HCs prefer to announce tender for opening offshore licences to investors. Before issuing such tenders, HC has to be sure about the status of above items to create an attractive atmosphere for potential bidders. Also tender strategy, financial terms/fiscal regime, contract methodology should be re-evaluated in every stages which are without discovery, after discovery, in exploration and production phases.

The petroleum law of Turkey published in 2013 and the regulations has been in effect since 2014. However there have been major changes in Turkey deepwater offshore activities after this year and some serious developments have taken place such as inclusion of 3 drillships in Turkish Petroleum (TPAO) Inventory, drilling one after another deepwater wells in Mediterranean and Black Seas, a gas discovery in the Black Sea, following potentials in the deepwaters and a deepwater service company established with own capital of TPAO.

As a result, petroleum contract type, tender strategy and fiscal regime of Turkey for deepwater operations should be re-examined and all related terms to be re-evaluated by considering current market conditions and any changes in the neighbouring countries. The modern fiscal terms which are currently used by most of countries could be considered while making these evaluations. One of this modern term is royalty systems based on sliding scales as per daily production or cumulative production. A sample deepwater project economics will be run to understand and compare the economic impacts of this system.

Keywords: Host Government Petroleum Contract, Fiscal Systems, International

Oil Companies, Deepwater Operations, Petroleum Law.

ÖZ

EV SAHİBİ DEVLET PETROL SÖZLEŞMELERİ VE TÜRKİYE DERİN DENİZ LİSANSLARI İÇİN BU SÖZLEŞMELERİN UYGULANABİLİRLİKLERİNİN KARŞILAŞTIRMASI

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Yüksek Lisans, Petrol ve Doğal gaz Mühendisliği
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Doğal kaynaklar da dahil olmak üzere coğrafi alanı üzerinde yasal hakimiyete sahip olan egemen ulusların sınırlarında, Dünya'nın enerji kaynaklarının büyük çoğunluğu üretilmektedir. Bir ülke, ev sahibi ülkeye atıfta bulunulan ve ev sahibi ülke ile Devlet Petrol Şirketi arasında imzalanan anlaşmalara atıfta bulunan arama ve geliştirme kaynaklarını ihaleye açarsa, özel şirketler veya bunların herhangi bir kombinasyonu petrol lisanslarını değerlendirmek ve / veya geliştirmek için başvuru yaptığı ülke ev sahibi olarak adlandırılır ve ev sahahibi ülke ile uluslar arası şirketin yapmış olduğu sözleşmeye de devlet petrol sözleşmesi denir.

Ev sahibi hükümet sözleşmesinin mali sisteminin, arama ve geliştirme faaliyetlerini teşvik etmesi, bazı zorlu alanlar için özel teşviklere izin vermesi ve Ev Sahibi Ülkeler (HC) ve Uluslararası Petrol Şirketleri (IOC'ler) için ekonomik gelirlerin adil bir şekilde paylaşılmasını sağlaması gerekmektedir.

Operatör için (devlet şirketi, ortaklık veya özel şirket) ilk ticari üretime ulaşılana kadar arama ve geliştirme aşamalarında derin deniz operasyonları için yapılan yatırımlar ve risk faktörleri çok yüksektir. Bu nedenle petrol kanunu, yönetmelikler, ev sahibi devlet sözleşmeleri ve ihale stratejisi aşağıdaki unsurlar göz önünde

bulundurularak düzenlenmelidir: jeoloji (sahanın petrol ve doğalhaz rezerv olasılığı, rezervin büyüklüğü, verimlilik ve HC kalitesi ve türü "gaz veya petrol"), ülke içi ve çevresindeki siyasi istikrar, yasal sistem ve mali sistemin uygunluğu, şeffaflık, piyasa koşulları ve operasyonel zorluklar. Derin Deniz Operasyonları, petrol endüstrisinde keşif ve üretim aşamaları ile en zorlu olanlarıdır. Bu tür derin deniz projelerini başlatmak ve devam ettirmek için, ülkeler yatırımcı şirketler için lisans ihalesi ilan edebiliyor. Bu tür ihaleleri vermeden önce, ülkeler, potansiyel teklif verecek firmalara çekici bir atmosfer yaratmak için yukarıda belirtilen faktölerin uygunluğunu kontrol etmelidir. Ayrıca ihale stratejisi, mali şartlar / mali rejim, sözleşme metodolojisi keşiften önce, keşif sonrası, arama ve üretim aşamalarında yeniden değerlendirilmelidir.

2013 yılında yayımlanan Türk Petrol Kanunu ve sonrasında da uygulama yönetmeliği 2014 yılında yürürlüğe girmiştir. Ancak bu yıldan sonra Türkiye derin deniz deniz faaliyetlerinde önemli değişiklikler olmuş ve 3 sondaj gemisinin Türkiye Petrolleri'ne (TPAO) dahil edilmesi, Akdeniz ve Karadeniz'de birbiri ardına derin deniz kuyularının sondajı, Karadeniz'de gaz sahası keşfi, yapılan 3 boyutlu sismik çalışmaları sonucu potansiyel rezervler ve TPAO'nun kendi sermayesiyle kurulan derin deniz servis şirketi gibi önemli gelişmeler yaşanmıştır.

Sonuç olarak, Türkiye'nin derin deniz sondaj ve üretim projeleri için petrol sözleşmesi türü, ihale stratejisi ve mali rejimi yeniden incelenmeli ve ilgili tüm şartlar, mevcut piyasa koşulları ve komşu ülkelerdeki herhangi bir değişiklik dikkate alınarak yeniden değerlendirilmelidir. Bu değerlendirmeler yapılırken şu anda çoğu ülke tarafından kullanılan modern mali methodlar dikkate alınabilir. Bu modern terimlerden biri, günlük üretime veya kümülatif üretime göre değişken ölçeklere dayanan telif sistemleridir. Sonuç kısmında önerilen modelin ekonomik etkilerini anlamak için örnek bir derin deniz proje ekonomisi çalışması sunulacaktır.

Anahtar Kelimeler: Devlet Petrol Sözleşmesi, Mali Rejim, Uluslararası Petrol Şirketi, Derin Deniz Operasyonları, Petrol Kanunu.

To My Family.

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I am grateful to be an employer of Turkish Petroleum in which I gained considerable technical experience in contract types, tenders and all procurement phases especially while working for TP Mansuriya Ltd and my current department is Offshore Operations.

I am proud of my parents who had grown three children with many sacrifices. They have been the main force and guide during my education and transfused many principles into me such as honesty, determination and passion for success.

Special thanks to my wife who has always been beside me with her continuous love and support. I am sorry to my daughter and my son because of stealing time we will spend with them.

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ABBREVIATIONS

ANP: Brazilian Competent Authority

CA: Competent Authority

CIT: Corporate Income Tax

EMV: Expected Monetary Value

E&P: Exploration and Production

EPA: Exploration & Production Agreement

EV: Expected Value

IOC: International Oil Company

IRR: Internal Rate of Return

HC: Host Countries

JMC: Joint Management Committee

JOA: Joint Operating Agreement

JV: Joint Venture

IRR: Internal Rate of Return

LPA: Lebanese Petroleum Administration

MC: Model Contract

NOC: National Oil Company

O&G: Oil and Gas

OPEC: Organization of Petroleum Exporting Countries

OPRL: Offshore Petroleum Resources Law

PL: Petroleum Law

PROFSH: Profit Share

PSA: Production Sharing Agreement

ROC: Regional Oil Company

SOC: State Oil Company

TPAO: Turkish Petroleum

UNCLOS: United Nations Convention on the Law of the Sea

CHAPTER 1

INTRODUCTION

The first commercial offshore oil well drilled by a "mobile" rig out of sight of land took place 70 years ago this year. This well, which was completed in 1947 at a depth of about 5 meters off the coast of Louisiana, marked the beginning of a new era for the global oil and gas industry. Since then, operators have progressed deeper and deeper in their quest for exploration and development opportunities, aided and accompanied by rapid technological advancements.

Global deepwater field production reached 10 million BOE/D for the first time in 2019. The deepwater market is on the way to reach 14.5 million BOE/D in the next five years. Deepwater gas has accounted for 58 percent of new volumes found in the last 10 years, with less than half of that deemed commercially viable. Ultra-deepwater supply will account for more than half of all deepwater production by 2023, with the majority of new supplies coming from offshore Brazil, Guyana, and the US Gulf of Mexico. By 2025, the Santos basin in Brazil and the Stabroek block in Guyana are expected to produce over 2.5 million barrels per day of oil. Because of the deeper depths and technological difficulties, deepwater exploration is out of reach for a significant portion of the industry (International Energy Agency, 2018).

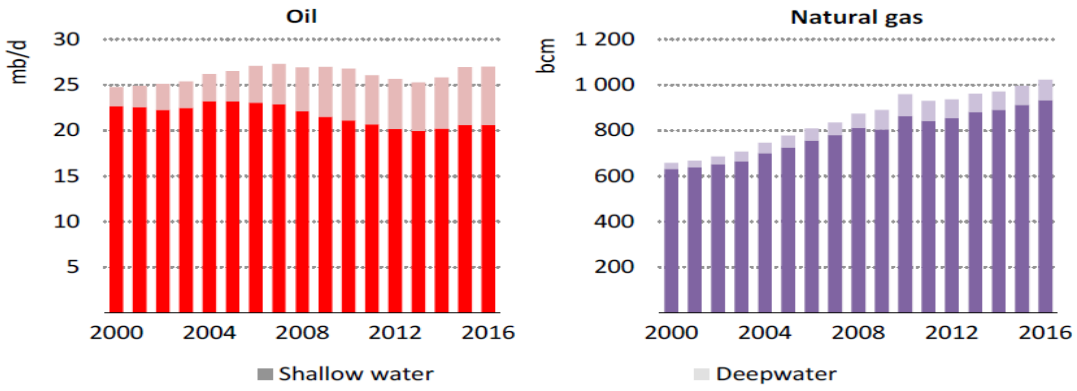


Figure 1-1_Global offshore oil and natural gas production by water depth

The international majors, along with Petrobras, now run more than 75% of deepwater supply. These eight firms (Petrobras, Shell, Chevron, ExxonMobil, BP, Total, ENI, Equinor) manage 23 of the top 25 deepwater projects. Also deepwater production has been dominated by these eight companies for more than three quarters (Journal of Petroleum Technology, 2019). Turkish Petroleum also has been one of the player of this deepwater market since 2018.

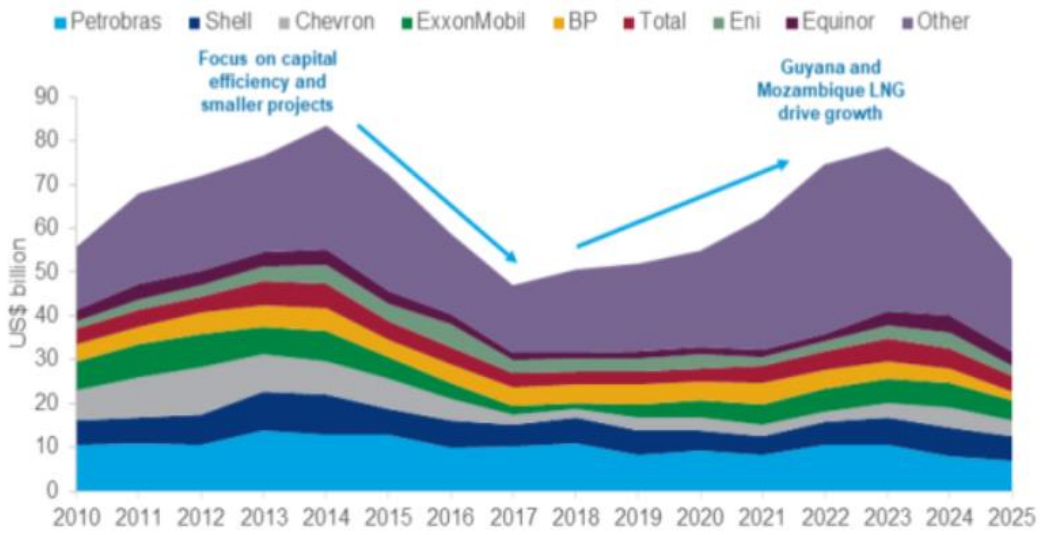


Figure 1-2_Deepwater Projects in the World

Turkish Petroleum, National Oil Company of Turkey and natural licensee of offshore licences, drilled 82 offshore wells (shallow, mid-water, deep water and ultra-deep water wells) from 1966 to now with some joint ventures and by oneself. The first deepwater well “Hopa-1” was drilled in 2006 by TPAO and BP which was operator and water depth was 1534m. Then Sinop-1, Yassıhöyük-1, Sürmene-1, Kastomonu-1, Sürmene RE-1 and Şile-1 deepwater wells were drilled in the Black Sea by Petrobras, TPAO, Exxon and Shell respectively. In these joint ventures TPAO always had a %50 of share with or without operator. Joint Venture (JV) is a kind of business arrangement that can be used associated with concession, PSAs and service contracts. All parties have homogenous rights and mutually share ownership of assets and management of operations. JVs can be created in two ways; via joint operating agreements (JOAs) or via joint venture corporations. Although the fiscal

regime is concession type in Turkey, TPAO established some different joint ventures with the dominated IOCs in accordance with petroleum law and regulations.

On the other hand, five fiscal systems have evolved that are currently being used on a worldwide basis.

1. Royalty/tax system – concession , license, lease
2. Contractual system – joint venture
3. Production Sharing Agreement/Contract (PSA or PSC)
4. Service or Risk Service Agreement
5. Hybrid Contract

In the first part of the thesis, Host Government Contracts categorized as: 1. Concession, 2. Production Sharing (PSA), 3. Joint Ventures (JVs), 4. Service Contracts, 5. Hybrid System are explained by giving major features of them.

In the second part of the thesis, the main contractual and fiscal terms used in petroleum contracts will be explained in details. After examining the commercial provisions of the contracts, it is explained what countries take into account in the selection of the contract. Which contract types are selected by other countries for deepwater offshore licences in the Mediterranean and Black Sea and which terms are improved and added after discovery of oil and gas in deepwater wells? Finally, potential offshore discoveries to be re-examined taking into consideration the laws and regulations in Turkey and international companies what kind of improvements can be done to encourage investment will be questioned. After analysis of these contract types, advantages and disadvantages of these contracts' types for offshore licenses of Turkey will be examined in details.

In order to determine the contract type, there are two main questions to be asked:

1. Who is right to explore and produce, Host Country or International Oil Companies (IOCs)?

2. Who owns the oil & gas resulting from successful activities, the host country or the international companies of oil?

Government take is the most important term when referring to the amount of money that a government receives from below payments (Boykett-Peirano-Boria-Kelley-Schimana-Dekrout-Oreilly, 2012):

- Bonuses
- Royalty
- Share of profits
- Income taxes

As a result, formulation of Contractor's profit is represented with below formula:

$$Profit = Gross\ Revenue - Capital - Operating\ Expenses - Government\ Take$$

Equation 1-1_Contractor's profit (Seba, 2006)

1.1 Concession Agreements

Concession Agreements are the first samples of host government agreements. However, concession agreements are categorized separately from the upstream Oil and Gas (O&G) contracts and recognize them as agreements of granting mineral rights ownership and the other three types of agreements as upstream contracts. On the other hand, some countries, like the UK and Denmark, call concession agreements as license and the International Oil Companies as licensee for avoiding the negative effect of term of concession.

The first concession contract was signed between William Knox Darcy and Shah Muzaffar al Din of Persia on May 28, 1901. This agreement was supported by the British Government and a major oil discovery was completed in Masjid Suleiman in Iran on May 25, 1908. In 1909 the Anglo-Persian Company went public and Darcy was bought out. In 1914 the company became a state oil company of England which was the world's first National Oil Company (NOC) and it was called as British Petroleum (BP) after privatization in 1986.

After the first World War petroleum gained prominence as the basic source of motor fuel. The US became as the new world power with an industrial establishment dependent on petroleum. By 1919 the US faced an oil shortage and the oil companies were encouraged to look potential, but most of prospective area (outside of Persia which was still dominated by BP) was already under a major concession agreement comprising Turkey, the Eastern Mediterranean countries and all of Asia minor. This concession area had been articled by an Armenian oilman, Calouste Gulbenkian, who retained 5 percent of the deal, with the rest held by European Oil Companies.

This concession known historically as the "The Red Line Agreement" had a provision in its charter that all participants agreed to work jointly together and only jointly within the region. The Red Line Agreement was terminated in 1938 when SoCal (now Chevron) and its partner (Texaco) drilled the discovery well in Saudi Arabia (Seba, 2006).

As per early concession contracts, IOCs actually owned reserves and any crude oil production which was subject to a royalty only. This ownership as a basic feature of concession type agreement eventually became a significant/political problem. Older concession agreements were for an indefinite period, but most of recent concession type of contracts are for a definite number of years.

The concession normally control all operation including exploration and production phases. The concession holder usually owns all equipment imported and used on the operation. This is in contrast to other types of agreements. The Host Countries/Governments are paid bonuses, rentals, taxes and royalties in cash.

Concession agreements are the first type of contract used internationally and in various forms still persist today. In current concession system, IOCs hold the ownership rights of the discovered O&G in licensed field during the period of agreement, and just pay taxes and royalties to the HC. HC still holds all mineral rights, but just the ownership title of produced O&G is transferred to the IOCs when production occurs. Mainly this transfer of ownership characteristic of concessions makes this type different from all other types of upstream O&G contracts.

All responsibility of operation costs, including exploration, development and production, remain on the IOCs regardless of O&G is found or not, and even some paid fees to the HC cannot be refunded in case of unsuccessful operations. Carrying all financial burdens of operations brings big risks for the IOCs, especially for the small sized IOCs in case of unsuccessful operations. Another difference of concession agreements is transferring ownership of all immovable and movable equipment and installations, except the leased ones, to the HC. These specific characteristics make the concession agreements attractive for the some HCs which do not have vast proved hydrocarbon reserves. However, even for all such risks, concessions are favourable for the IOCs that conducting their operations in resource rich regions.

Generally concession agreements are granted with both exploration and production rights for the IOCs. Nevertheless, it is also possible to provide these concessions separately in two different types as exploratory concessions and production concession, like provided in British system (Smith-Dzienkowski-Anderson-Lowe-Kramer-Weaver, 2010). In this system, exploratory concessionaire collects seismic and geophysical data during first term, and drills a test well as a second term duty. This concessionaire cannot get production license automatically, even in case collected data proves a petroleum reserve, and this IOC is required to join bidding process with other interested IOCs for the production concession agreement. These companies generally aim to sell this data to big market players that are willing to bid for a production license in that subject field. Of course, getting an exploratory license is much cheaper compare to cost of gaining a production concession agreement.

For getting a concession agreement, the companies bid to obtain licenses for the fields. The countries with proved reserves can get better return because of competitive bidding process since they can get extremely high share offers from bidders. Also, the IOCs would like to have a license in these states rather than taking a huge risk while spending money and time in a country with no proved petroleum reserves, so that makes them come out with attractive offers for the HCs.

1.2 Production Sharing Agreement

Production Sharing Agreements (PSAs) are a form of contract signed between a National Oil Company (NOC) and an International Oil Company (IOC) that is prepared to carry out production activities of O&G in the host countries (HC). This type of upstream agreements is very beneficial for the HCs with petroleum reserves, but who have lack of expertise and technology for prospecting O&G.

In 1960, Indonesia Law No.44 declared formally the Production Sharing Agreement (PSA) (Johnston, 1994). This was a major milestone in the history of international petroleum contracts and, in fact, has almost become an industry standard.

The first important PSA was made in Indonesia in 1966 with Indonesian American Petroleum Company (IIAPCO) for exploration of 56,656 km2 offshore Northwest Java. Amoco in Egypt and Mobil in Indonesia followed shortly after with PSA's related to already established production (Johnston, 1994).

Under a PSA, the HC retains the ownership rights of O&G reserves and just gives IOCs an interest in produced oil in order to cover their expenses and have a share in profit. On the other hand, the HC grants the IOCs complete rights to control and operate the growth of the oil fields. Thus, the IOCs conduct all operations by themselves and share produced O&G with the HCs. However, sometimes the National Oil Company (NOC) may involve in operations even that does not mean sharing costs and risks with the IOCs. In some contracts, it can be optional participation clause and in such cases, the NOCs join operations when production phase starts. Such cases seem to be unattractive for the IOCs because this participation means also intervention of the HCs to daily management issues, even the IOCs remain as sole operator. Generally, all financial risks remain on the IOCs unless the IOC signs a consortium with the NOC in which case this NOC also takes some risk as an interest holder in PSA. The shared output fraction from the project is referred to as profit oil which the residual of the production (gross income) after

payment of royalty to the host country/government and reimbursing the IOCs for his capital and operating expenditures.

Many countries prefer this system, such as Malaysia, Indonesia, Thailand, Nigeria, and Mexico. Recently, also Brazil abandoned its concession system in favor of PSAs after discovering large amount of reserves in its territories. President Lula said that: “The only reason to keep a Concession system is if a country is not certain it will find petroleum, but when we know that the oil is there, and that oil is a state resource, why should we grant concessions?"(Newsweek, 2015).

1.3 Service Contracts

Service Contracts are obviously the simplest type of all Host Government Agreements. The IOCs get paid with pre-determined fees by the HCs or the NOCs for developing and/or exploring O&G fields on the behalf of a HC. On the other hand, all produced mineral reserves continue to stay as property of the HCs.

After 1960s, oil industry started to look new areas to explore oil and gas outside of Organization of Petroleum Exporting Countries (OPEC). It made service contracts very popular among some HCs since IOCs take all risks and expense of exploration and production. In return, IOCs are paid a stipulated fee per barrel produced for the account of the NOC. The contract is to develop the reserves for the HCs. IOCs recovers his costs from a portion of production ahead of service fee. All facilities and equipment imported to country become the property of mineral owner.

Mainly, service contracts have many similarities with PSAs. In comparison to the PSAs, the key distinction between these two forms is whether the contractor is paid in cash or in oil, service contractor receives compensation in cash. In another word, a. Because of these two types’ similarities, some of the IOCs and the HCs sometimes call service contracts as PSAs. For example, in Philippines, government signs O&G contracts under the terms of PSAs or service contracts, but in general, refers all these contracts as PSAs.

Especially, having the ownership rights becomes very important if any dispute arises because owner of the mineral rights keeps power in its hands. As different from concessions and PSAs, in which petroleum rights ownership transfers to the IOCs when production occurs, in service contracts, mineral rights ownership never transfers to the IOCs. Therefore, the IOCs work just as contractor under supervision of the HCs while not getting any share from produced petroleum, except a fee. With this contract type, resource rich countries can take benefit of the IOCs' capital or expertise and experience while just paying a service fee rather than sharing their resources with these companies. Iraq and Ecuador are some of these HCs that prefer service contracts (Park, 2014).

1.4 Joint Venture/Participation Agreements

In late 1950's, IOCs and NOCs started to make joint ventures in the Middle East. The general request was for the contracting company to bear all the risks of exploration by transporting the host government before discovery. If there is a commercial discovery, the HC contributes its proportional share of the development costs, although frequently the IOC must also carry the government through development. Reimbursement for development costs and any reimbursable exploration expenditures are typically made from an agreed fraction of the production share of the host country.

The first JV agreement was signed between Amoco (Pan American Oil Company) and Iran in 1958 (Smith-Dzienkowski-Anderson-Lowe-Kramer-Weaver, 2010). Under these agreements, an operating company was formed by HC jointly with the contractor for the production of petroleum within a specified area. As per deal, the Iranian NOC (NIOC) and Amoco Iran formed a jointly owned 50/50 company. However, 50% of Amoco share was subjected to a 50% of government tax, resulting in an effective 75/25 ratio. This agreement was effective until 1978, Iranian revolution.

When joint ventures started to use widely, HCs usually held 50 percent, or slightly less, of basic joint venture splits. After the contract between Libyan government and Occidental in 1973, government shares became more than 51 percent commonly (Park, 2014).

Arab States in the Persian Gulf started to renegotiate their concession agreements since 1967 in order to change them as participation agreements, which were later modified in favor of the HCs and became JV agreements. This process was also supported by the UN's resolutions concerning permanent sovereignty over natural resources, and then in 1968, OPEC prepared a similar declaration over states' rights on petroleum resources. Also, implemantation of PSAs in Indonesia during 1960s gave a strong bargaining power to the Arab States (Mazeel, 2010). Participation agreements also became JV as a result of creating management committees, so the HC can take part in decision-making process. However, participation agreements just focused on increasing funds rather than also focusing on gaining technical expertise or taking part in management because at that time, these agreements were the only alternative mechanism to concession agreements besides nationalization like Iraq did in 1972 (Park, 2014).

In respect of relationship between parties, the main thing is that all parties have same amount of interest defined in the contract, so each party can only behave as per contractual rights by cooperating with other parties. All parties must act as one company in their relations with grantor of oil contract which is HC or NOC. Also each party is responsible to the grantor as per their interest such as payments to HC.

Some co-venturer IOCs may prefer to establish an independent corporation for their E&P operations, instead of just signing a JV agreement. Mainly, these corporations' working policy is almost same with non-incorporated JVs. Management duties of management committee in a JV are conducted by the board of directors of new established corporation. Every participants of a JV are also represented in company and board of directors. This new company works like any other IOC as a contractor, however the partners dissolve the company following the end of intended operation

unless the parties agree upon to continue with the same JV Corporation for their upcoming E&P projects.

1.5 Hybrid

Hybrid type contracts are increasingly introduced by Host Governments and it is a combination of concession, production sharing and service contracts. Combinations of royalty, levy, JV membership, cost of oil/profit oil shares and fees are included in these forms of contracts. One explanation for this form of contract is that host governments are searching for arrangements that fulfill their unique needs. Also IOCs are not necessarily prepared to accept similar fiscal terms in different countries.

Some of countries/governments prefer to mix different features of four types of Host Government Contracts to make a new settlement and contract terms which are called hybrid type. The most common method to add state participation.

In the world distribution of these entire contract types are as follow (Rystadenergy, 2014):

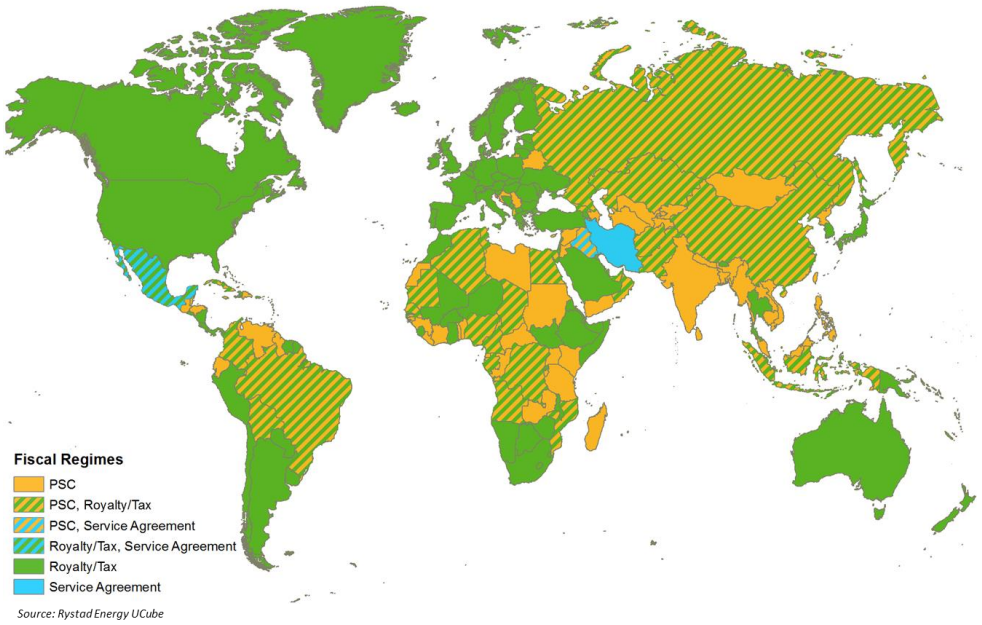


Figure 1-3_Distribution of Fiscal Regimes in the World

Most of the states still prefer to use concession and some hybrid type of concession. Then PSA/PSC contract type is more common than JV and service contracts.

1.6 Production of Oil & Gas

Petroleum operations basically consist of three stages; exploration, development,

Production and transportation.

Exploration stage starts with seismic procedures, and continues with drilling exploratory wells following the positive outcomes from seismic data. In that way, a cylindrical portion from the earth (coring) can be cut for analyzing. During the analyses, specialists look for the hydrocarbons in that portion, and in case they find some clue about any potential oil and gas reservoirs, more seismic and exploratory well drilling operations take place to decide whether discovery is a commercial discovery, in another word it is worth the cost to get it out of the ground, or not.

During second stage, which is development stage, oil companies try to make decisions related to engineering, business, and community issues. For example, which kind of equipment they need to choose depending on the geological formation, how much money they need for completing the operation, company's job creation policy in a HC, or environmental protection policies of the company. This stage may require the most amount of money among all stages because sometimes companies may need to construct costly offloading and storage units or new drilling equipment. Finally production stage starts, and O&G flow for some time depending on the size of reservoir until operation halts with ending of commercial production. Even technically some petroleum remains underground, but in commercial aspects, abandonment/decommissioning procedure starts while the IOCs are restoring the environment to its original stage (Boykett-Peirano-Boria-Kelley-Schimana-Dekrout-Oreilly, 2012).

1.7 Ownership of Oil & Gas Rights

Most countries have mineral rights and territorial sovereignty over the land, territorial sea attached to the land, seabed and territorial sea subsoil. United Nations Convention on the Law of the Sea (UNCLOS) says that:

- A state's sovereignty extends to its territorial sea, including its bed, subsoil and air space
- A state may create a territorial sea up to 12 nautical miles from the coast (low water mark)
- continental shelf extends beyond the territorial sea through the natural prolongation of its land territory to the outer edge of the continental margin, but not to exceed 200 nautical miles
- a coastal state may exercise sovereign rights over its continental shelf
- a coastal state may establish an Exclusive Economic Zone of up to 200 nautical miles from shore for exploring, conserving and managing natural resource.

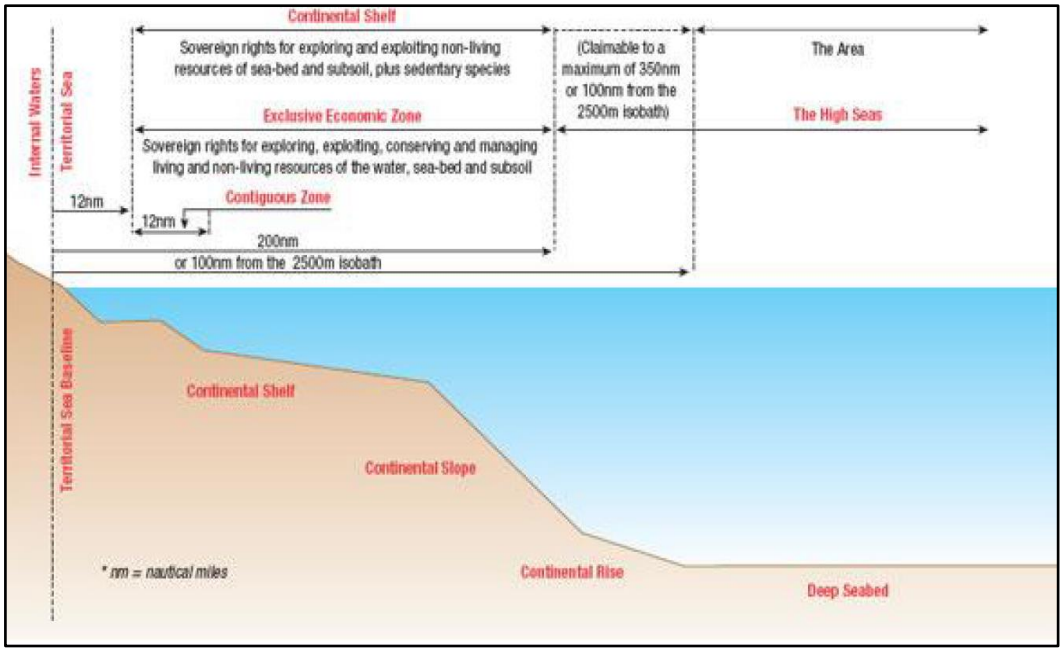


Figure 1-4_Offshore Jurisdiction (UNCLOS)

1.8 Upstream Oil & Gas Industry

Oil and Gas (O&G) operation stages can be subdivided into three major industries; (1)upstream, (2)midstream, and (3)downstream (Citizendium, 2010).

The upstream O&G industry, which is also called as exploration and production (E&P) sector, indicates the sector that especially focuses on exploration of underground and underwater O&G reservoirs, and drilling and operating wells to extract these minerals.

The midstream O&G industry covers the petroleum products' transportation, storage, and wholesale marketing activities.

The downstream industry involves the refining of crude oil and the processing of crude natural gas, as well as the marketing and distribution to consumers of petroleum products such as oil, natural gas, diesel, asphalt, LPG, etc (Ahmadov, 2009).

CHAPTER 2

LITERATURE REVIEW

Probably, the most difficult question for a HC related to its upstream O&G sector is "which type of contract is more suitable for its needs?" While answering this question, it should be always kept in mind that, a HC is the one who decides its own contract type as a petroleum rights owner, and the IOCs which are willing to conduct E&P operations in that country have no other option to get out of the system settled by HC that has already decided a contract frame by laws or regulations, even some minor points still can be negotiable as long as the HC's system allows.

Upstream oil and gas contracts can be categorized as (1) concession agreements, (2) production sharing agreements/contracts, (3) service contracts, (4) Joint Venture and (5) Hybrid. This section will cover main definitions used in the contract types, discuss these contract types while giving details about evolutionary history of each type, and it also provides wide information about the duties of parties, fiscal terms, advantages and disadvantages of contracts for the parties, while mentioning details from awarding process to taxation differences with various examples from oil producing countries.

2.1 Definitions

2.1.1 Competent Authority

A single government agency which expected to have sectoral expertise and experience, should be assigned with exclusive authority to implement petroleum sector policy, it would be a single contact point for IOCs during negotiations, contracting, regulation and administration of sector. However it is not a

recommended approach, State Oil Company (SOC) is a natural Competent Authority (CA) for most of states.

If SOC has not enough experience and expertise and host country is new to petroleum sector, an inter-ministerial council or consultative group could be preferred not to create a disincentive atmosphere for foreign investors. CA should issue all licenses and they must be competent with petroleum law (PL), regulations and petroleum agreement. It provides maximum flexibility for conducting petroleum operations to private entity/joint venture.

CA prepare and make available a model contract (MC) which has full details for negotiation and maintain maximum flexibility to potential investors.

2.1.2 Petroleum Operations

There are some responsibilities of Competent Authority (CA) and awarded bidder (Licensee) while performing petroleum operations (Park, 2014):

- Licensee will submit annual work program for approval,
- CA to provide copies of geological, geophysical, well and other technical data in a timely manner,
- Licensee will use only best available machinery, equipment, supplies and technology,
- CA shall guarantee reasonable and timely access to contract area,
- Licensee will notify CA in advance of drilling operations, as well as plugging and abandonment,
- Accounting to CA for all petroleum produced through proper metering, measuring and transporting from contract area.
- CA will set minimum/maximum period for each exploration, appraisal and development phases with possible extension periods.
- Minimum work obligations to be stated in quantitative and/or monetary terms which needs to be guaranteed by bank or stand by letter.

Licensee is aware of environmental protection to minimize ecological damage, avoidance of waste, prevention of pollution (land, water, crops, marine and animal life), emergency clean up procedures, restoration of environment.

The processes of petroleum operations generally divided into two phases contractually: Exploration (3-15 years) and Production (15-30 years) (Park, 2014). There will be minimum work obligation and/or minimum work expenditures such as conducting seismic, driling exploration well and/or spend any amount of money on exploration activities. If an exploration well is drilled with oil and/or gas, it is called a discovery. After notify the government, investor conduct a plan for appraisal operations to understand that it is a commercial discovery. If a commercial discovery is made, the investor then proposes a development plan for the field that has been defined. After getting approval from CA, development operations and production period can be started.

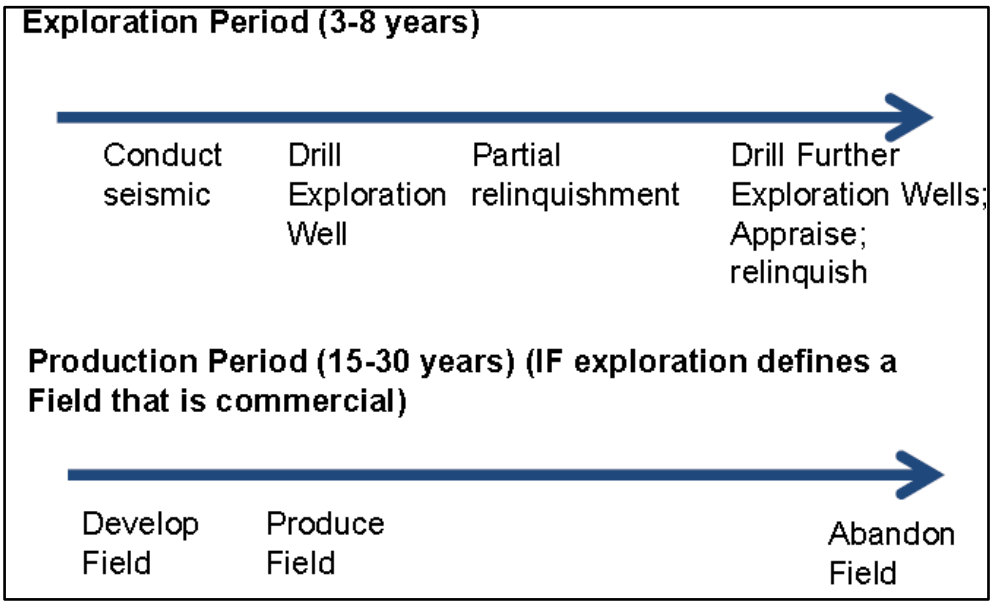


Figure 2-1_Exploration and Production Periods

2.1.3 Petroleum Agreement & Regulations

Oil & Gas law is actually the application of (Park, 2014):

- property law
- contract law
- statutory law
- administrative law
- constitutional law
- torts, trusts, and others

Parties may choose to make the domestic law of a particular jurisdiction apply to a contract or relationship in another jurisdiction. Types of domestic law are common, civil and Islamic laws.

International law principles can affect private international business transactions with taxation treaties and trade agreements. International treaties are intended to have the effect of overriding domestic law. They may not necessarily be incorporated into domestic law, but domestic approval is typically required after the treaty is signed. Energy Charter Treaty signed in December 1994 and Timor Gap Joint Development Treaty signed on 11th of December 1989 are two examples for international law principles (Park, 2014).

Petroleum regulations that maintain maximum flexibility and speed of action for changing conditions may be a subsidiary of Petroleum Law (PL). While Petroleum Law does not only summarize the areas in which CA may/must take regulations, but also is a broad authority for CA to make all necessary regulations in consistent with PL.

2.1.4 Qualifications, duties and rights

To pass prequalification, IOCs must have compulsory financial resources, technical competence and professional skills to conduct petroleum operations. CA should clearly define the topics for reporting discoveries, presenting the development plan and using best practices in the petroleum industry, according to stated qualifications. The guaranteed rights of the licensee shall be defined as the security of the contract

period, exclusive rights in the field of licenses, the right to proceed from exploration, discovery to production and development without the discretion of the government.

2.1.5 Fiscal and Financial Regime

Fiscal regime of a host country present a clear picture of applicable tax regime, provide fair and equitable tax treatment for all investors. Also no double taxation and assurance of home country foreign tax credits could be some advantages for International Oil Companies (IOCs).

CA gives freedom for import-export supplies for petroleum operations and make easier for obtaining import-export licenses.

The matter of how the foreign oil company "contractor" is to be paid by the host government is one of vital question for development of a newly discovered oilfield. From beginning of exploration period to end of production period, below figure is a graph how costs and net revenues will be acting (Park, 2014):

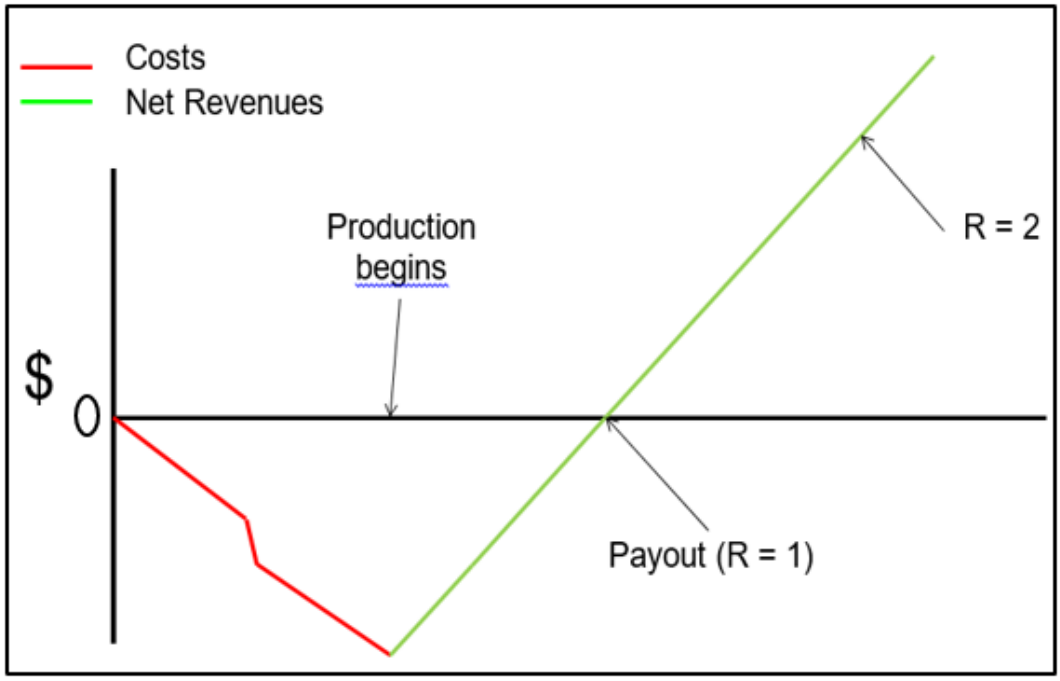


Figure 2-2_Cost vs Net Revenue

2.1.6 Bonuses

Bonuses are single lump sum payments made by IOCs to HCs and there are two types: signature bonus and production bonuses. Signature bonus might be defined in bidding or negotiation process or it is already defined in the law and/or regulations. In the North America, bonus amounts vary from 2,000 to 10,000,000 USD and 200 USD per hectare in Gulf of Mexico (Park, 2014).

In a discovery, a commercial discovery, application for a development area or development license, start of production, upon meeting certain pre-determined levels of production or cumulative production, production incentives may be required.

Production bonuses usually at various levels of production, for instance: $ 5 million when commercial production reaches 10,000 bopd. Production bonuses are usually included in production sharing or joint venture contracts in Asia and Africa.

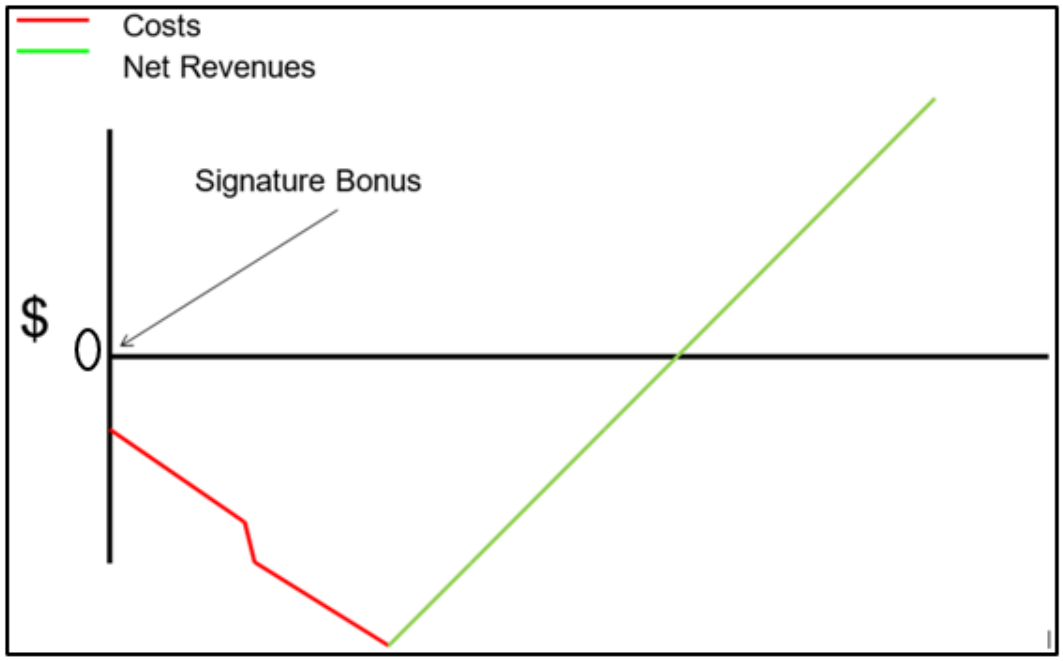


Figure 2-3_Signature Bonus effect on Net Revenues

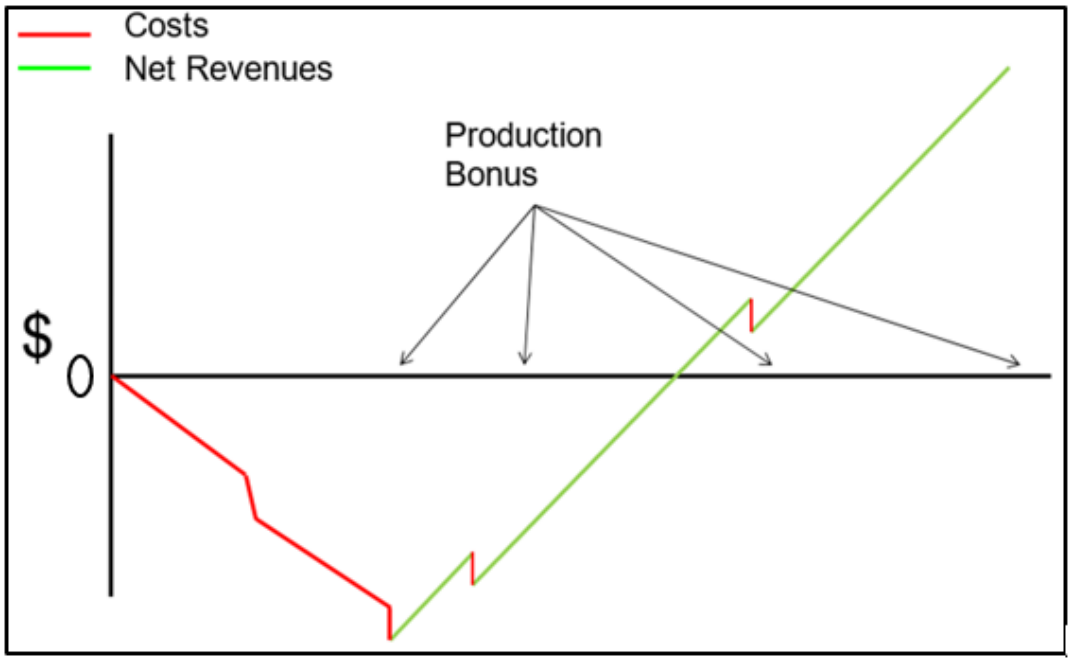


Figure 2-4_Production bonus effect on net revenues

2.1.7 Rentals

Rentals are payments per year, usually before the first day of the new license or contract year. Rentals are usually fixed by legislation or sometimes negotiated or % of bonus bid. Rentals might be applicable in exploration and production phases. It could be a lump sum payment (100,000 USD per year, a constant payment per hectare (3 USD acre/year) or a payment increases overtime (10 USD km2 during 1st exploration period, 20 USD per square km during 2nd exploration period). The purpose of rentals are to provide income for government to run administration (particularly for non-producing areas) and to encourage voluntary relinquishment of acreage.

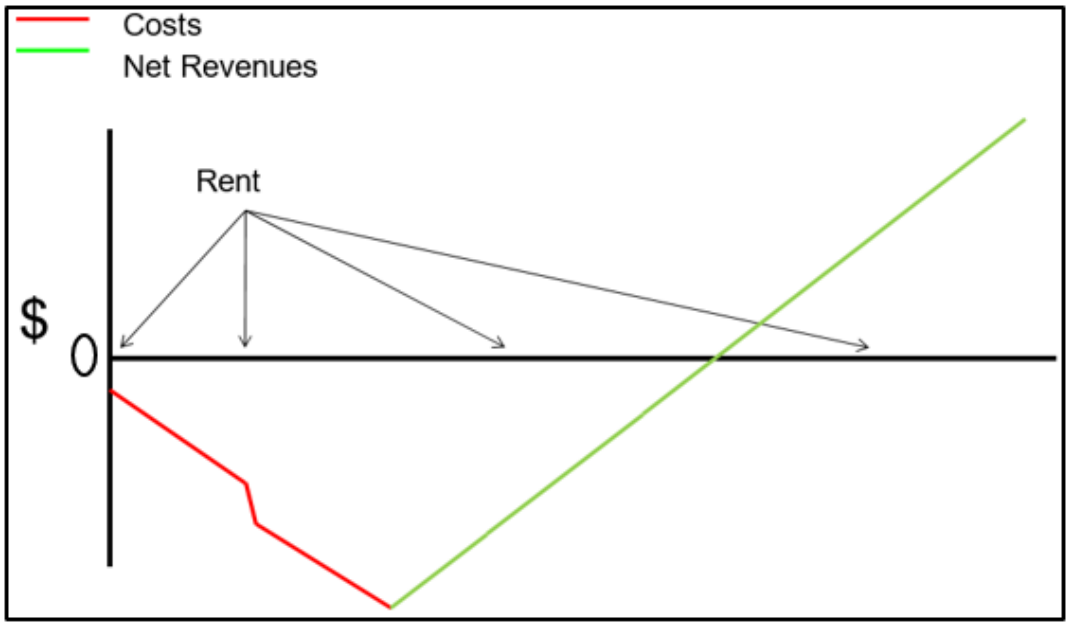


Figure 2-5_Effects of Rentals's Cost on Net Revenues

2.1.8 Royalties

Royalties are payments that are related directly to the gross value and amount of the production. Types of royalties are fixed payments per unit of production, a fixed percentage of production and sliding scale royalties.

Fixed royalties are one of the oldest forms of income for government. It used to be a frequent feature of the concessions in the Middle East. This type of royalties is not preferable longer by most of HCs. Fixed percentage royalties are widely used such as 1.25% Papua/New Guinea, recently 2%, 15% Congo, South Korea, Mozambique, 16.67% Venezuela, many states of the US, 30% Venezuela – 2002 oil royalties. Algeria uses 10% to 20% royalty depending on the geology of the areas, 12.5% for the geologically more attractive offshore and 10% for onshore in Trinidad, 20% onshore and offshore based on water depth: 16.7% to 200 m, 12% to 500 m, 8% to 800 m, 4% to 1000 m and 0% over 1000 m in Nigeria (Park, 2014).

Sliding scale royalties depend on the level of output of the field or well, total production, production and price level of the well, based on payout or factor R or IRR. The following sliding scale refers to the onshore Chinese (Park, 2014):

Table 2-1_China Sliding Scale Royalties

Royalty Ratio (Up To)	Cumulative Production (Tons/Year)
0,0%	50.000
1,0%	50.000
2,0%	50.000
3,0%	50.000
4,0%	100.000
6,0%	200.000
8,0%	250.000
10,0%	250.000
12,5%	1.000.000

The Alberta government has decided on October 2007 to replace the existing system and adopted formulas for conventional oil and gas, whereby the royalty consists of two components: Royalty = Royalty based on volume + Royalty based on price. The royalties on volume and price are both based on a sliding scale. Total maximum royalty applied by HCs is 50% and minimum 0% for oil and 5% for gas.

The applicable royalty for the entire production is the one identified in the sliding scale. For instance in Ecuador there is a minimum royalty called participation as follows (Park, 2014):

Table 2-2_Ecuador Sliding Scale Royalties

Royalty Ratio (Up To)	Cumulative Production (Barrel Oil/Day)
12,5%	30.000
14,0%	60.000
18,5%	Over 60.000

The royalty in British Columbia and Manitoba based on well production such as 16.67% to 50% from 100 to 500 bopd. For offshore Morocco, royalty based on cumulative field production (e.g. first 29.2 million barrel are free.). In Peru and Madagascar, a royalty increases with an R factor. In Guatemala, royalty is 5% for 15 degrees API and 20% for 30 degrees API.

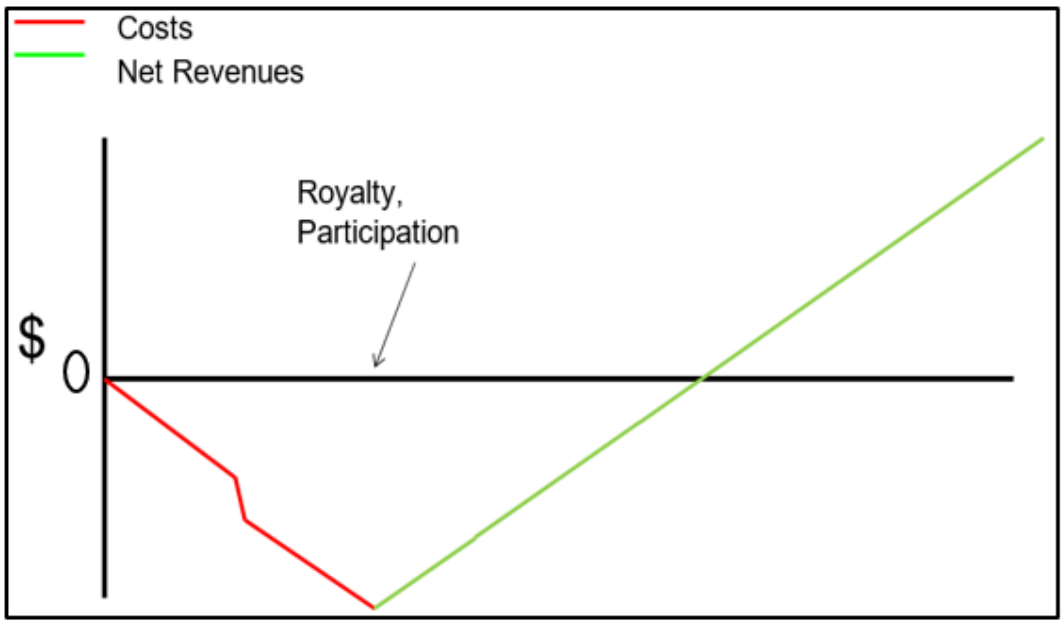


Figure 2-6_Royalty Participation Impact on Net Revenues

2.1.9 Corporate Income Tax (CIT)

Corporate income tax (CIT) is very different from other fiscal instruments because it is paid at the level of the corporation. This means corporate income tax is usually not paid field by field, or contract area by contract area. The tax is usually paid on all licenses or contract areas combined.

Table 2-3_Calculation of CIT

Corporate Income Tax Calculation	
Gross Revenues	**100**
Minus or Less	
Payments to Government	20
Operating Costs	15
Depreciation	20
Interest on Loans	5
Prior losses	10
Taxable Income	**30**
Tax Rate, say %40	12
After Tax Income	**18**

Gross Revenues for corporate income tax purposes are typically based on free market prices means that International Prices. Prices for CIT purposes are usually determined at the point of sale. In many countries, the government and the petroleum industry have agreed on detailed calculation procedures for arriving at an "international price". Gross revenues for royalty and CIT purposes are usually not the same. While royalty income is only production based, CIT income also includes other sources of income, such as the sale of information or interest income or income from pipeline transport and even refining. Point of calculation is wellhead or field measurement point for royalties, point of sale for CIT.

Table 2-4_Income Tax Ratios in 2019 (World Bank, 2019)

Countries	**Income Tax ratios**	**Countries**	**Income Tax ratios**
Bahamas	0,0%	Canada	30,0%
Chile	17,0%	United Kingdom	30,0%
Poland	19,0%	Nigeria	30,0%
Russia	24,0%	China	33,0%
Guatemala	25,0%	Germany	33,0%
Ireland	12,5%	France	33,3%
Turkey	22,0%	India	33,6%
Norway	28,0%	Brazil	34,0%
Malaysia	28,0%	Venezuela	34,0%
Mexico	29,0%	Argentina	35,0%
Netherland	29,6%	Colombia	35,0%
Peru	30,0%	United States	35,0%
Algeria	30,0%	Italy	37,3%
Australia	30,0%	Japan	40,7%
Indonesia	30,0%	Gabon	73,0%

There are two basic method of taxation based worldwide income and national income. Nations that use the world wide system of taxation provide foreign tax credits in order to provide tax relief for taxes paid in foreign countries. Countries have rules in order to determine whether a foreign tax is indeed a corporate income tax.

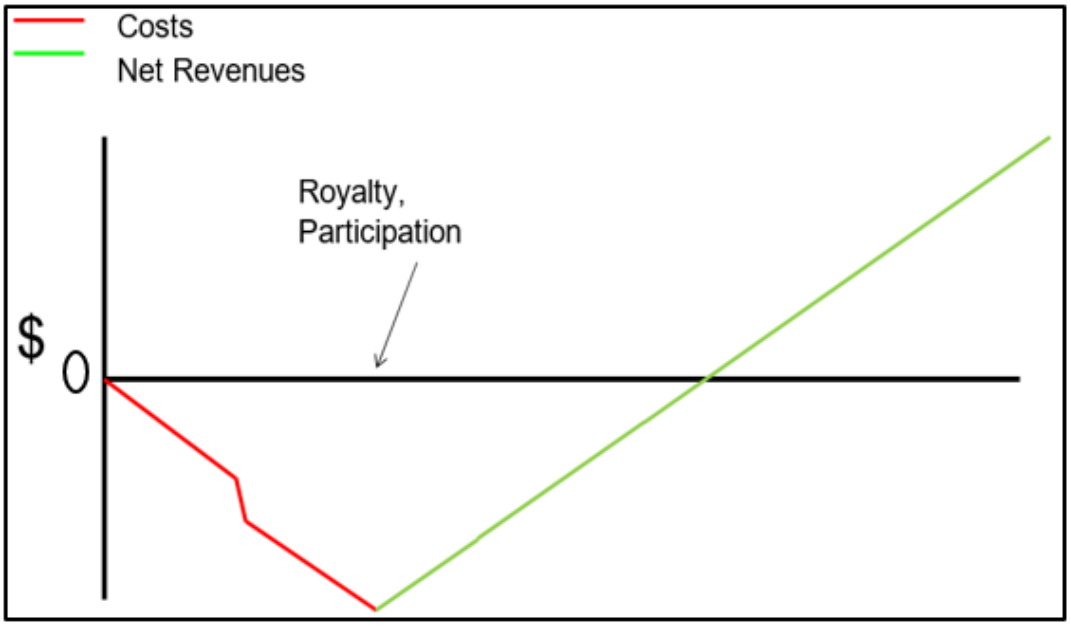


Figure 2-7_Corporate Income Tax Impact on Net Revenues

2.1.10 Profit Oil

There are many concepts which developed with respect to sharing of profit oil: fixed percentage split and sliding scales based on a variety of variables. Ukraine (40%), Albania (40-60%), Bulgaria (50%), Tailand and Malaysia (50% for Joint Development Area), Oman (80%) are the countries which apply fixed profit oil (Nakhle, 2008).

Sliding scale profit oil depends on daily or cumulative production, R Factors, Field Production Levels, Internal Rate of Return (IRR), Payout. For Instance Malaysia Conventional: from 50% up to 10,000 bopd 70% over 20,000 bopd. However, at a cumulative production of 50 million barrels, the rate becomes 70%. Guyana has some contracts where the profit oil is split on the basis of production level and price. This also applies to deep water PSA's in Trinidad Tobago. Libya and Malta use sliding scales based on production levels and R factors. Many PSA's have sliding scales based on ROR (Bindemann, 1999).

Nigeria and Pakistan offshore apply sliding scales based on cumulative production. In the year PSA's of 2000 the Nigerian scale was as follows (Nakhle, 2008):

Table 2-5_Nigerian Profit Oil Scale

Volume up to (M bbl)	**Profit Oil to NOC**
350	30,00%
750	35,00%
1000	47,50%
1500	55,00%
2000	65,00%
Over 2000	Negotiable

Trinidad & Tobago Deep Water Exxon Contract (Park, 2014):

Table 2-6_Trinidad & Tobago Deep Water Profit Oil Scale

Volume up to (M bbl)	**Profit Oil to NOC**
350	30%
750	35%
1000	47,5%
1500	55%
2000	65%
Over 2000	Negotiable

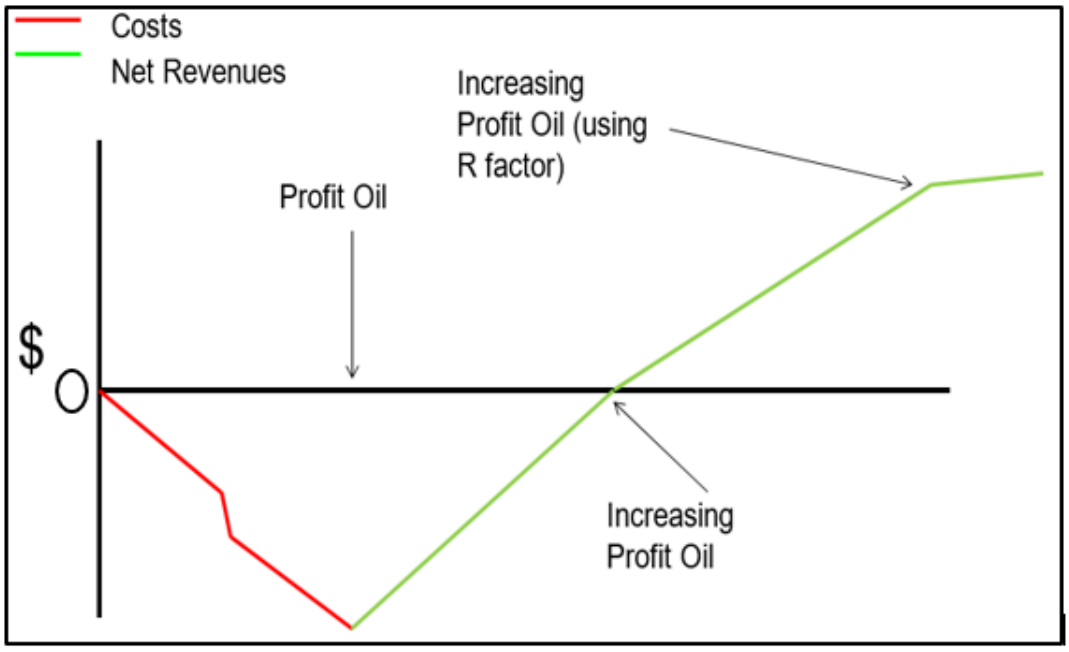
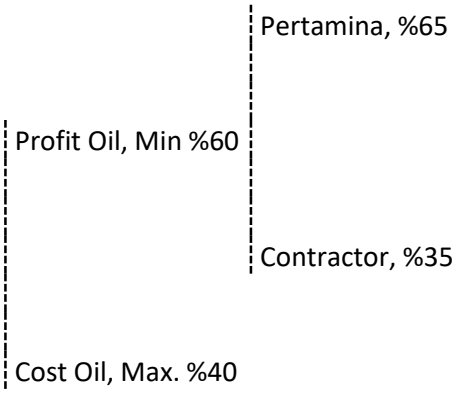


Figure 2-8_Profit Oil Impact on Net Revenues

2.1.11 Cost Oil

There are a number of variations with respect to the cost oil/cost recovery related to cost oil limit and calculation of the costs. Indonesia currently use production sharing Agreement and as per fiscal regime maximum cost oil could 40%, rest of amount is called as profit oil which also shared as 65% and 35% by NOC (Pertamina) and Contractor respectively (Park, 2014):

Table 2-7_Indonesian Cost Oil Model



Cost Oil is normally a fixed percentage of production, but a sliding scale could be used without limit or depending on production or price levels (Park, 2014):

Table 2-8_Cost Oil Limits of Countries

Countries	**Fixed Cost Oil Limits**
Croatia	25,0%
Laos	33,0%
Libya	35,0%
Vietnam	38,5%
Kazakhstan	45,0%
Gabon	50,0%
China Onshore	60,0%
China Offshore	62,5%
Turkmenistan	70,0%
Pakistan Offshore	85,0%

Cost oil sliding scales are only applied in a few countries: North Korea: 60% up to 50,000 bopd, and ends at 50% over 100,000 bopd, Syria: 25% up to 50,000 bopd and 20% over 50,000 bopd, Oman has a cost oil limit that start at 50% when the oil price is less than $ 17 per bbl and ends at 30% once the oil price is $ 21 per bbl or more. Sudan has a system whereby the gap between the cost oil limit and the actual costs goes 100% to the State. In the Philippines, there is a participation allowance, equal to 7.5% of gross production in case there is 30% Filipino participation. Indonesia has introduced a feature which is called First Tranche Petroleum. An amount of 15% of the petroleum is set aside directly from the beginning as profit oil, and is split with the contractor in accordance with the profit oil split in the contract. Cost oil can be recovered from all petroleum except the First Tranche Petroleum. Conditions for gas are always more favourable than for oil in order to stimulate gas

generation. In some contracts in Malaysia, for instance: the price oil limit is 50 percent, the cost gas limit is 60 percent (Bindemann, 1999).

In order to be able to calculate cost oil and cost gas separately, a cost allocation procedure has to be established in the contract, usually based on gross revenues from each source.

After the price shock of the 1970's many governments introduced additional fiscal features in order to capture additional divisible income based on the following concepts:

1. Gross Revenues,
2. Surtaxes,
3. Net Revenues,
5. Internal Rate of Return ("IRR") / R-Factors,
6. Uplifts with combination of the above concepts.

2.1.12 R Factor

The R-factor can be used to make a sliding scale. These sliding scales can be used with respect to: Royalties, Profit Oil or Profit Gas Splits, Taxes or Profit Shares, Net Cash Flow Share. There is a wide range of R-factor definitions:

Equation 2-1_R Factor Formula

$$R = Cumulative\ Revenue / Cumulative\ Cost$$

There are many different application of R factor. In the below table, Peru uses r-factor to arrange royalty rate (Park, 2014):

Table 2-9_Peru R Factor Scale

R Factor Scale Applicable to Royalties	
R-Factor	Royalty Rate
0<R<1	15,0%
1<R<1,5	20,0%
1,5<R<2	25,0%
R>2	35,0%

Production Sharing Contracts (PSCs) mostly use ROR based sliding scales for profit oil shares. For instance, if R= 1.60 and Production is 100,000 bopd in Libya, the profit oil share to the contractor would be 60% of 72.5% or 43.5%:

Table 2-10_Libya R factor Scale (Park, 2014)

R-Factor		Production up to (bbl)	
0-1	80%	25000	90%
1-1,5	70%	50000	80%
1,5-2	60%	100000	60%
2-3	40%	200000	40%
Over 3	30%	Over 200,000	20%

2.1.13 Net Revenues

The participation ratios are different for onshore and offshore. The government take increases with higher prices, but the government take does not decline when prices decline or does not decline proportionate with price: IRR based system and/or R-factors, Algerian PRT (one way). Two way adjustment result in a higher government take when prices go up, but result in a lower government take again when prices go down: windfall profit taxes and Thai SRB.

Examples of One Way adjustment features are found in the following countries (Nakhle, 2008):

- Russia – Sakhalin – IRR based profit oil split
- Angola – IRR based profit oil split
- Australia – PRT
- Ghana - APT
- Canada – NWT – IRR based profit share
- Canada – Alberta – Oil Sands – IRR based profit share
- Azerbaijan – IRR and R-factor based profit oil splits
- India – R-factor based profit oil splits
- Peru – R-factor based royalty
- Libya – R-factor based profit oil splits
- Algeria – PRT style profit share

Examples of Two Way adjustment features are found in the following countries (Nakhle, 2008):

- Malaysia - price cap in PSC's with special profit share
- Pakistan – offshore, windfall profit feature in PSC's
- Colombia - windfall profits feature in new concessions
- Thailand – SRB profit share
- Trinidad & Tobago – Supplemental Petroleum Tax
- Trinidad & Tobago – price sensitive PSC scales

2.1.14 Service Fee Concept

With a service fee system, the contract defines a fee or set of fees payable to the contractor the government receives the remainder of the value of the oil or gas. There are some models such as Iraq 1996, North Kuwait. Cost reductions are fairly spread, corporate income tax is charged by the IOC and all charges are cash only. Oil fees per barrel, gas fees per MMBtu, allowance per CAPEX recovery, allowance for OPEX recovery.

In the world, these type of contracts and related fiscal regimes distribution are summarized in the below tables (Park, 2014):

Table 2-11_Fiscal Systems in the World

Fiscal Systems		
No	**Contract Type**	**Total Numbers of Countries**
1	Concession	60
2	PSA	41
3	Joint Venture	27
4	Service	4
5	Hybrid	16
Total		148

Table 2-12_Concessions Fiscal System

Concessions				
Royalty Only	**CIT Only**	**Royalty and CIT**	**CIT and PROFSH**	**Royalty and CIT and PROFSH**
3	5	38	4	9
Bahamas	UK & Ireland	Canada & Peru	Norway & Australia	Tailand & Namibia

Table 2-13_PSA Fiscal System

Production Sharing Agreements			
PSA Only	**PSA & CIT**	**PSA & Royalty & CIT**	**PSA & CIT & PROFSH**
13	11	15	2
Egypt & Yemen	Angola & India	Guatemala & Indonesia	Sri Lanka

Table 2-14_JV Fiscal Systems

Joint Venture Agreements		
JV & Royalty & CIT	**JV & Royalty & PROFSH**	**JV & CIT & Royalty & PROFSH**
18	3	6
Columbia & Pakistan	Cameroon	Netherland

Table 2-15_Hybrid Fiscal Systems

Hybrid				
PSA & JV	PSA & JV & CIT	PSA & JV & Royalty	PSA & JV & Royalty & CIT	PSA & JV & Royalty & CIT & PROFSH
3	2	3	7	1
Libya	Kenya & Mauritania	Gabon & Myanmar	China & Malaysia	Tanzania

2.1.15 Awarding Upstream Oil and Gas Contracts

There is no single "best way" to award host government contracts. Alternatives for awarding contracts(Smith-Dzienkowski-Anderson-Lowe-Kramer-Weaver, 2010):

1. Public International Bid Round
2. Restricted Invitation Bid & Negotiation Process
3. Direct Negotiations
4. Award based on Application

Competitive systems, especially public international bid systems, generally work best, where there are competitive conditions. A minimum of four bidders is generally required. Therefore, negotiated awards should be avoided wherever possible by states seeking to maximize the award based on the identified criteria.

2.1.15.1 Public International Bid Round

State announces its intention to award petroleum contracts in respect of identified areas however qualification criteria may be applicable. While process and terms are public, data is provided to interested bidders by signing confidentiality agreement. State may request a fee for data package. Award is made on empirical basis or technical and financial terms by using a point system. Opening of bids is public by attendance of an independent observer. Generally there is no negotiation of the contract terms after the award.

2.1.15.2 Restricted Invitation Bid & Negotiation Process

Where the number of suitably qualified bidders may be limited, it may be appropriate to invite only those who are qualified. Otherwise, the process may be similar to the public international bid, with "public" matters revealed only to those who are invited. Where the number of bidders is small, a negotiation process may be suitable with those who have been invited.

For awards where a negotiation process may be necessary, a common variation is a broad invitation for bidders to submit a "non-binding expression of interest", or a "non-binding indicative bid" that precedes a more thorough due diligence process. State then selects the "short list" (3 to 6) of bidders who conduct a more thorough due diligence and then negotiations begin.

2.1.15.3 Direct Negotiations

In some cases, it is suitable to conduct direct negotiations with a single bidder. Generally, these involve situations where there is some prior right or special entitlement on the part of the party involved.

2.1.15.4 Award Based on Application

In some cases, the party who wishes to conduct activity expresses interest where there are no others involved or interested. This is a suitable situation for private negotiations, because a bid-based award will not work effectively, as it assumes a competitive system.

There are some bid criterion such as: Bonus Bids, Discount Bids, Royalty, Profit Sharing, Production Sharing Bids, Work Program Bids and Point System Bids.

2.1.15.5 Signature Bonus

Signature bonus bidding is a very common system. In Alberta, Canada, the state fixes the royalty and tax provisions of its concession regime, and offers blocks in public international bid rounds twice every month. Offered blocks are usually small (often under 2 km2). Blocks selected by government based on posting request by potential bidder. No qualification criteria at time of offer (but only licensed persons can obtain a drilling license). Concession is awarded to person offering the highest signature bonus. This is a simple, single factor system that works well with an active, competitive oil industry with many players. Awarded bidder gives government some revenue regardless of whether exploration is successful. In 2006, Alberta generated over $3 billion in bonus revenues, including one $465 million bid for a large oil sands block. However, it is regressive, and may not maximize long term revenue (Smith-Dzienkowski-Anderson-Lowe-Kramer-Weaver, 2010).

2.1.15.6 Discount Bids

In some states, the base fiscal terms are defined, and the block is awarded to the person who offers the largest discount from the base fiscal terms. For example, Mexico's Multiple Services Contract involved a defined schedule of service fees for the IOC's range of activities. Mexican law required that the contract be awarded to

the person offering the "lowest price" (Smith-Dzienkowski-Anderson-Lowe-Kramer-Weaver, 2010).

2.1.15.7 Royalty, Profit Sharing and Production Sharing Bids

Almost any fiscal factor can be used as a basis of a bid. For example, the State of Alaska has used such bids. It is common to establish a base royalty or profit/production share, and the winning bid is the highest increment over the base.

2.1.15.8 Work Program Bids

Where the state's interest is to maximize exploration activity, a work program bid is suitable. All fiscal factors are fixed, but the amount of the minimum work program is the bid variable. The winning bid is the largest increment over the base (often expressed in $, or wells, or "work units"). Bolivia and Canada have used such a bid factor (Park, 2014):

Table 2-16_Work Program Bids

Scope of Work	**Work Unit Quantity**
1 Km of 2D seismic	1 Work Unit
1 km2 of 3D seismic	5 Work Units
a 500m well	500 Work Units
a 1000m well	1500 Work Units
*a base work program of 3000 work units for first exploration period **Work unit gives oil company the flexibility to determine the most suitable exploration effort ***performance security is based on the value of a work unit	

2.1.15.9 Point System Bids

Point system bids are suitable where there are multiple bid criteria. The weighting of each criteria is determined by a prior allocation of points to each bid factor. Trinidad and Tobago, and China have used such systems (Seba, 2006). Example of Point System Bid:

- Bid protocol calls for a two factor bid: signature bonus and work unit above base of 3000.
- Signature bonus is weighted at 40%, work units at 60%, assume two bidders. Bidder A: $5,000,000 signature bonus, 2000 incremental work units, Bidder B: $10,000,000 signature bonus, 1200 incremental work units.

- Bidder A:
  - 5 points for its signature bonus bid (because it is half of the top bid)
  - 10 points for its work unit bid (because it is the top bid]
  - multiplied by the weighting factor, this is (.4 x 5 pts) + (.6 x 10 pts) = 8 points
- Bidder B:
  - 10 points for its signature bonus bid
  - 6 points for its work unit bid
  - multiplied by the weighting factor, this is (.4 x 10 pts) + (.6 x 6 pts) = 7.6 points

All of the preceding bids involve objective bid criteria. This is the strongly recommended practice since subjective bid criteria are difficult to measure.

2.1.16 Petroleum Regime

The importance of petroleum regime for host country are increase of petroleum resources, access to modern technology, improvement of sector management's skills, increase financial resources for development, long term relationship with oil and gas market. Therefore basic economic, political and social advantages for host country are:

- Develop the sector,
- Gain access to its petroleum resources,
- Generate revenues from taxes,
- Obtain technology transfer,
- Obtain know-how,
- Re-tain most of its petroleum wealth,
- Create employment and material preferences,
- Generate and retain hard currency,
- Foster social prerequisites
- Stimulate competition in the sector,
- Encourage and pressure its NOC to reform,
- Preserve political and strategical alliances,
- Liberalize sector prices and procedures,
- Respond to the interest of local populations,
- Protect and preserve the environment.

Main objectives of investors (IOCs) are:

- Develop reserves,
- Diversify asset base,
- Minimize capital and operating cost,
- Maximize operational freedom,
- Provide for assured contract validity and enforcement,
- Reasonable taxation and royalties,
- Reasonable limitation of liability proportionate to risk/reward ratio,
- Maximize equity returns,
- Assume reserve, operating and market risks,
- Share construction risks,
- Minimize political risk and provide for stabilization of investment,
- Establish long term, mutually beneficial relationship with host country.

Also, there are main components which must be settled for a petroleum regime (Park, 2014):

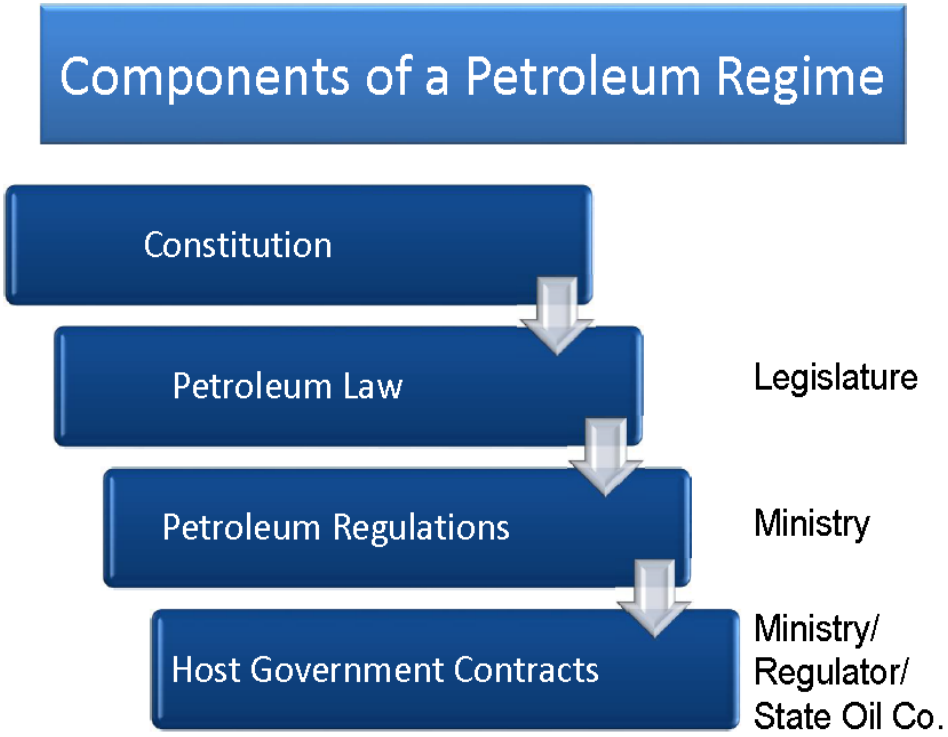


Figure 2-9_Components of a Petroleum Regime

In order to create a legal regime, constitution, related petroleum laws and regulations must be declared as per requirement of countries' resource areas. Many constitutions of countries reserve ownership of natural resources to the state.

For instance, Iraq started to establish legal regime after the war, they already has a 3.5 MM bbl/day oil production with experienced personnel. However new government had to take a decision about private investment by justifying the need of this private capital to enhance Iraq's economy. For IOCs, an established petroleum legal regime was a critical prerequisite since IOCs have suffered losses in situations where they ventured into countries that lacked a settled legal regime for oil&gas.

2.2 FISCAL TERMS IN HOST GOVERNMENT CONTRACTS

There are five types of fiscal regimes currently used:

1. Concessions,
2. Joint Ventures,
3. Production Sharing,
4. Service Contracts,
5. Hybrids.

Main differences of these contract types are owner of produced oil and gas, right to sell and interest amount (Park, 2014):

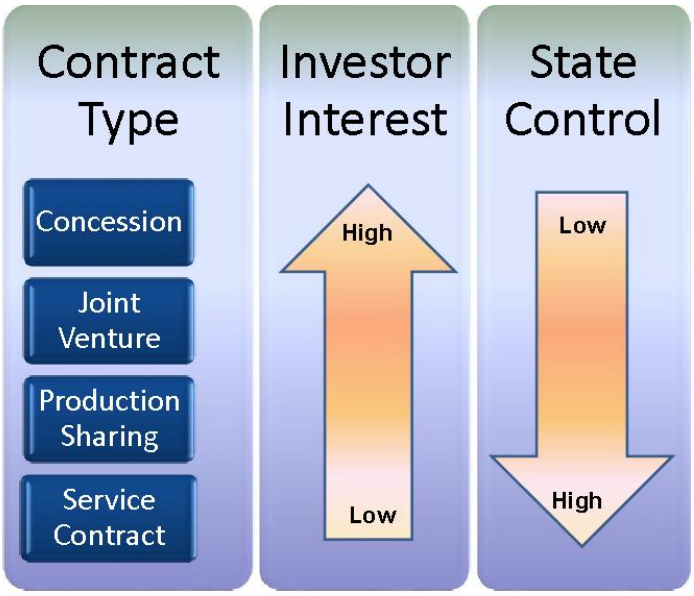


Figure 2-10_Investor Interest vs State Control

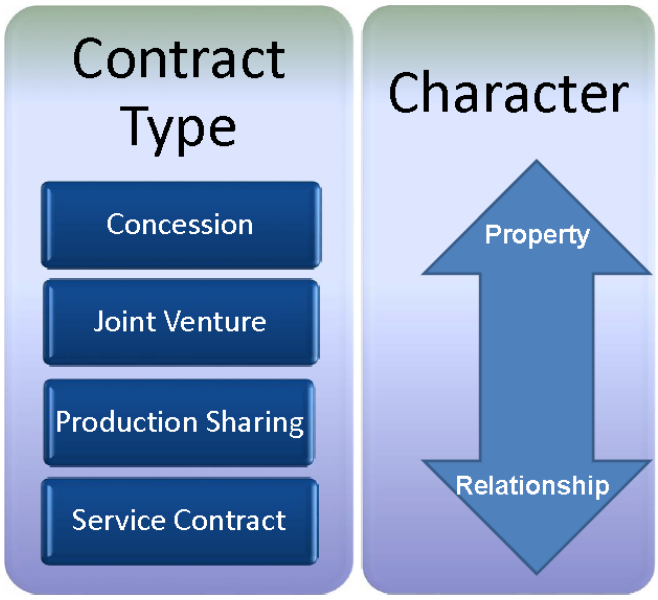


Figure 2-11_Property vs Relationship

2.2.1 Concession

The concession also known as lease or license is the oldest and still most widely used type of contract in the world. US, UK, Norway, Thailand and Australia mostly used concession which gives maximum control to IOCs. Governments usually do not obtain output of oil and gas in excess of that which they buy for domestic supply. Generally, export rights are granted to IOCs. The licensee receives all oil and gas output, subject to the duty to pay royalties and taxes.

In 2001, Brazilian concession agreement was awarded by Brazilian Competent Authority (ANP) after seven rounds. The term of agreements was 27 (twenty seven) years after declaration of commerciality. The concessionaire shall relinquish to the ANP at least the percentage of the original concession area at the end of each exploration cycle. At the end of the exploration process, only the development areas approved by the ANP may be maintained by the concessionaire and all the remaining areas may be abandoned. During the Exploration Phase, the Concessionaire shall complete in its entirety the Minimum Exploration Program for such Exploration Period.

Upon declaration of commerciality, the concessionaire shall deliver to the ANP, within a constant period of time, the related development plan prepared in compliance with the applicable Brazilian legislation and the best practice of the oil industry. As per the agreement, the concessionaire has to purchase some percent of goods and services from local suppliers.

The percentage of royalty is 10% and landowner payment is 1% of oil & gas production. Also, the Concessionaire is liable for taxes and has to make investment for Research & Development (R&D) as 1% of production gross revenue according National Agency of Petroleum (2018).

2.2.2 Production Sharing Agreement

States assign a competent authority (CA) for exploration and development rights. CA enters into a Production Sharing Agreement (PSA) with International Oil Company (IOC) where IOC, acting as Contractor, finances and conduct exploration and development. By obtaining a share of production if petroleum operations are successful, the IOC will recover its costs and receive a profit. Costs are extracted from oil for cost recovery, which is normally limited to a fixed output percentage. Production not used for cost recovery is called profit oil which is shared between State and IOC on either a fixed ration or variable share based on production volumes. A pure PSA does not involve income taxes and royalties. However income tax is still applicable, royalty sometimes apply in many cases. While NOC has contractual control, IOC has significant control. PSAs are mostly used by Indonesia, Malaysia, Libya, Egypt, China and others.

The fiscal terms of production sharing contracts is summarized in the below graph (Park, 2014):

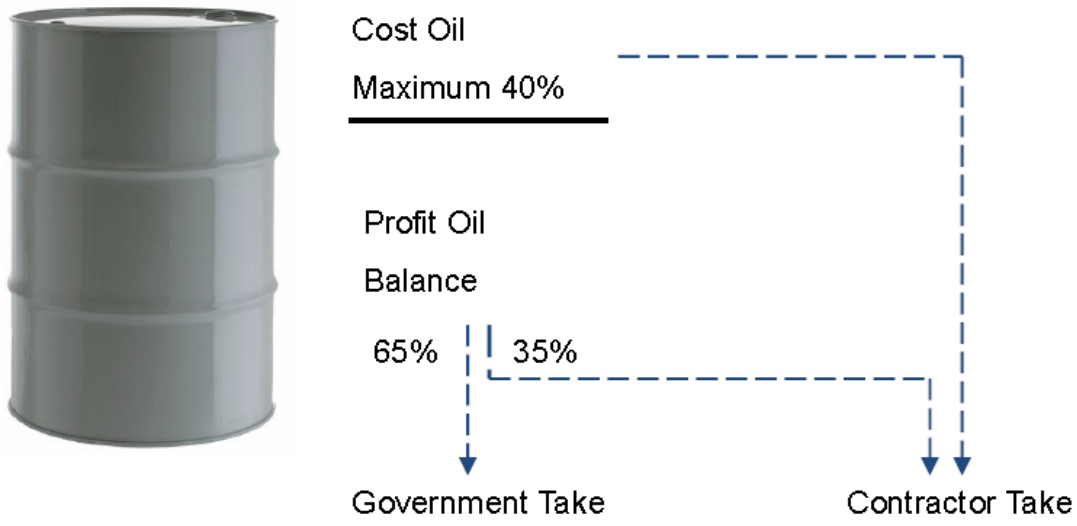


Figure 2-12_Profit Oil vs Cost Oil

As an example from Indonesian production sharing agreement (Park, 2014):

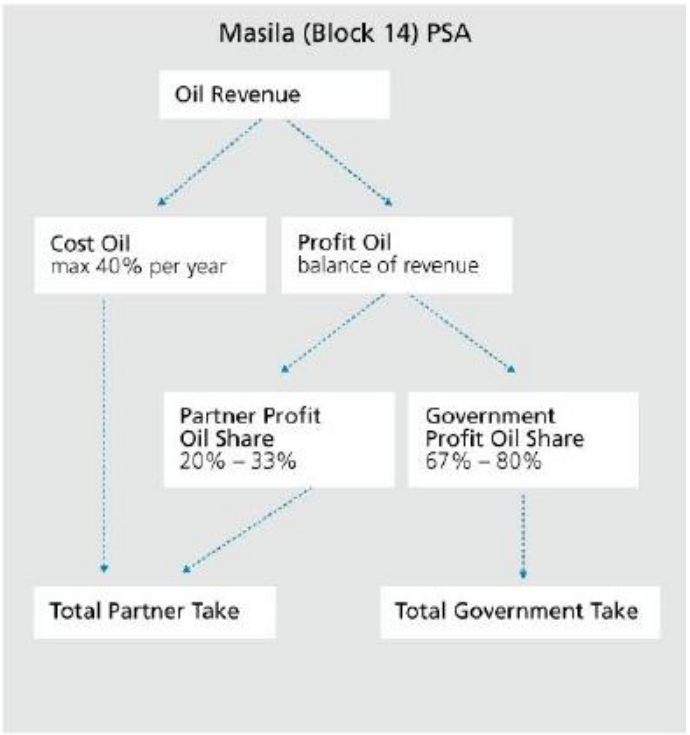


Figure 2-13_Indonesian PSA Shares

In 1998, Pertamina (Perusahaan Pertambangan Minyak Dan Gas Bumi Negara) was assigned as granting party by Indonesian Government. BPMIGAS was the

competent authority and it granted the production sharing agreement. As a prof of Production Sharing Contract, the clause says that (Park, 2014):

- This Contract is a Production Sharing Contract.
- Pertamina shall be responsible for the administration of the activities and shall be responsible for them.
- Contractor shall be responsible to Pertamina for the execution of all operations in accordance with the provisions of the Contract, and Unocal Ganal, Ltd. shall be the operator for and on behalf of Contractor and is hereby appointed and constituted the exclusive company to conduct Petroleum Operations in the Contract Area.
- Both financial and technical assistance for such operations is offered by the contractor. The contractor shall bear the risk of the operational costs needed for the carrying out of the operations and shall therefore have an economic interest in the production of the petroleum deposits in the contract field, such costs being included in the recoverable operating costs.

The term of the agreement was 30 years after effective date. After ten years, Contractor will not have more than 20% percent of contract area after relinquishments. As per the minimum work program and expenditure, Contractor committed 14 MM USD for the first 3 years for exploration activities. After ten years, Contractor will pay 37 MM USD totally for exploration activities (Park, 2014):

Table 2-17_Exploration for Masila (Block 14) in Indonesia

Contract	Programme	Amount
First	G&G	$ 4.000.000,00
Second	1 Well & G&G	$ 5.000.000,00
Third	1 Well & G&G	$ 5.000.000,00
Forth	1 Well & G&G	$ 4.500.000,00
Fifth	1 Well & G&G	$ 4.000.000,00
Sixth	G&G	$ 4.500.000,00
Seventh	1 Well & G&G	$ 3.000.000,00
Eighth	1 Well & G&G	$ 3.000.000,00
Nineth	G&G	$ 1.000.000,00
Tenth	1 Well & G&G	$ 3.000.000,00
Total		$ 37.000.000,00

Contractor has to submit annual work program & budget to Pertamina at beginning of each Calendar Year at least three (3) months ago.

The contractor shall pay the applicable income tax to the Government of the Republic of Indonesia, including final tax profits after tax deductions levied on it under the Indonesian Income Tax Law. After commercial production commence, Contractor accepted to sell and deliver 25% percent of oil & gas into domestic market. Contractor is authorized to sell crude oil produced from contract area by Pertamina. The Contractor shall recover all Operational Costs from the proceeds of sale or other disposal of the quantity of Crude Oil demanded, equal to the amount of those Operating Costs produced and saved hereunder and not used in Petroleum Operations. Crude Oil remaining after deducting Operating Costs, the Parties shall be entitled to take and receive each year, respectively thirty seven point five percent

(37.5000 %) for Pertamina and sixty two point five percent (62.5000 %) for Contractor.

Before any deduction for recovery of operating costs and handling of production, Pertamina and Contractor will take and receive per year a quantity of petroleum equal to fifteen percent (15 percent) of the petroleum production of each of those years, called the First Tranche Petroleum.

Contractor accepted to pay to Pertamina as compensation for information now held by Pertamina the sum of eight hundred thousand United State Dollars (US$ 800,000), after approval of this Contract by the Government of the Republic of Indonesia in accordance with the provisions of applicable law. Contractor also accepted to pay some other bonuses (not included in operating cost) for 80, 150 and 200 MMBOE as 2 MM, 2 MM and 3 MM USD respectively. Any purchased equipment will be titled to Pertamina (Park, 2014).

2.2.3 Service Contract

All exploration and development costs are financed by IOCs which recover these expenditures through a discounted crude purchase price, cash payments or production take. State retains entire production upside, although it may grant a negotiated sliding share of oil produced service fee generally is not affected by the price of the produced oil and gas. Some performance bonuses might be applicable to IOCs by encouraging higher production, sometimes with additional fees at higher production thresholds and to reduce operating and capital costs. This type is the most suitable for risk free operations and less relevant to exploration. IOCs are generally subject to income tax and generally dislike to be service Contractor to the state. Therefore it is infrequently used in the world by some countries such as Mexico, Iraq, Iran, Oman and formerly used by Venezuela.

The model of service contract with some hybrid features is from Iraq in 2010. There is no grant of the right to explore & produce oil & gas, therefore the Contractor

provides services to an Iraqi regional operating company (ROC) (ie. North Oil Company, etc.) in return for payment of service fees. Contractor is paid a fee calculated in dollars, not a share of the production. The Contractor is to be a consortium that includes an Iraqi state entity with a 25% participation. Contractor provides “close coordination and consultation”, and operates the field jointly with the operator. The related parties of the Contract:

- “Regional Oil Company" (ROC) is the Iraqi state oil entity currently operating the field,
- “Company" is the international oil company (or consortium),
- "State Entity" is another Iraqi state company that is to be the co-venturer with the Company, as to 25% interest,
- Company and State Entity are together the Contractor.

Initial Production (10% of plateau production) and Plateau production periods are defined in the contracts. It is expected to reach initial production after 3 years from effective date and plateau production after 6 years from effective date. The term of contracts are 20 years with 5 years extension. Preliminary development plans are prepared by Contractor and submitted to JMC (Joint Management Committee) in one year after effective date (Park, 2014). The approval process of related rehabilitation plans (Park, 2014):

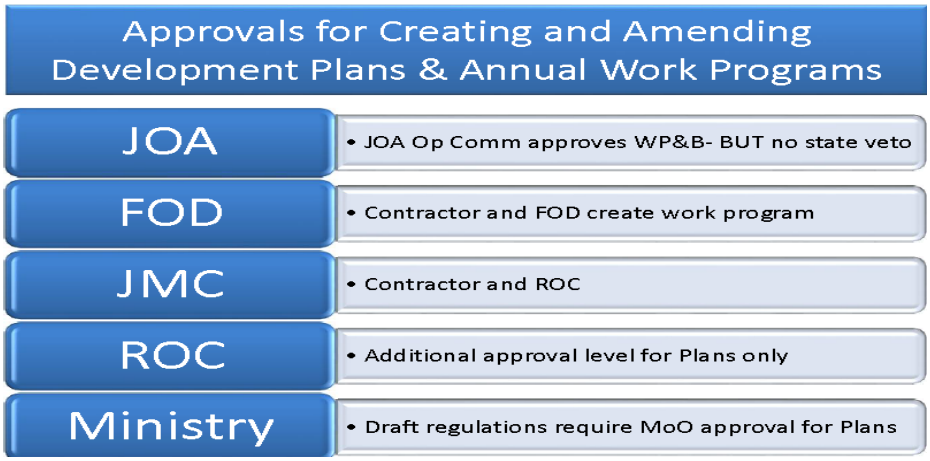


Figure 2-14_Iraq Service Contract Approval Process

The Parties establish a joint management committee referred to herein as the "Joint Management Committee" or "JMC" within thirty (30) days after Effective Date for the purpose of general supervision and control of Petroleum Operations. The JMC consist of eight (8) members. The ROC shall nominate four (4) members, including the Chairman. Contractor (through Co-operator) shall nominate four (4) members, including the Deputy Chairman and the Secretary. JMC decisions shall be made by unanimous vote of or by proxy of the members or their alternates present at the meeting. In the event that the JMC is unable to make a consensus decision on any matter under the Contract, it shall immediately refer the matter to the senior management of the Contracting Parties for resolution (Park, 2014).

Table 2-18_Iraq Tender Terms, 2010

Items	**Round 1 terms**	Additional Terms	**Round 2 terms**	Additional Terms
Government Participation	25%		25%	
Signature Bonus (MM USD)	200-500		100-250	Not Refundable
Duration (years)	20	7 years for enhanced production	20	Plateu production after 7 years
Renumeration fees	Biddable		Biddable	
Income Tax	35%		35%	
Cost Recovery	100%	max. Limit 50%	100%	max. Limit 50%
Take or Pay Arrangements	Yes	for gas fileds	Yes	for gas fields

Service Fees are the sum of recovery of Petroleum Costs incurred, and remuneration fees, comprising per barrel fees payable on excess production above base production rate. Remuneration fees are determined by bidding. Payment of service fees may be in cash or in barrels of oil having a value equivalent to the cash amount. Contractor pays income tax (Global Oil and Gas Tax Guide, 2019) of 35% based on remuneration fees. There is a ‘performance factor’ that reduces the fees payable if

production targets are not met. Contractor is Operator of the field until R=1 and ROC elects to create a JOC to become operator.

All assets obtained and/or supplied by the Contractor or Operator in connection with or in connection with Petroleum Operations, the costs of which, in compliance with the terms of the Contract, are subject to recovery, shall become the property of ROC upon their landing in the Republic of Iraq. The achievement of Iraq from this service contract are:

- Service contract imposes obligation on Contractor to increase production, and creates an incentive to do so through a 'per barrel' fee.
- IOCs are only contractors, and are not even the operator of the field in Round 1 oil fields– only 'co-operator'.
- Bidding a negotiation process has resulted in low per barrel fees of $1.90 to $2.00.
    - 25% goes to state as participant ($2.00 – 25% = $1.50)
    - 35% income tax on the remainder ($1.50 – 35% = $0.975)
- R Factor reduces the per barrel fee to only 30% once R equals 2 ($0.975 x 0.3 = $0.29).

Therefore the Service Contract is a remarkable achievement for Iraq when measured on the goals of:

- Increasing production
- Maximizing state control
- Limiting IOC revenue and giving all of the oil price 'upside' to Iraq.

However there are some challenges for MoO and IOCs in the performance of the service contracts:

- Complex and duplicative approval process,
- Responsibility to achieve production goals with limited authority to direct operations,

- the IRR associated with incremental expenditure may be too small to justify it.

R factor of Iraq service contracts and formulae (Park, 2014):

Table 2-19_Remuneration Calculation for Iraq Service Contract

R Factor	**Remunaration Fee per BBL (USD)**
<1	%100 of fee bid
1 to <1.25	%80 of fee bid
1.25 to<1.5	%60 of fee bid
1.5 to 2	%50 of fee bid
2	%30 of fee bid

Equation 2-2_R Factor Formula for Iraq

$$R = (\frac{AggregateCashReceipts}{AggregateExpenditures}$$

Sample calculation (Park, 2014):

Table 2-20_Comparison of Projects in Iraq

Items	**Project 1**	**Project 2**
Base Production (M bbl/day)	100	100
Plateu Production (M bbl/day) after 7 years	400	400
Capex (Billion USD)	5	**7.5**
Opex ($/bbl)	3	**4.5**
Remuneration Fee ($/bbl)	6	6
Cash Flow (M USD)	6833	**7823**
Net Present Value (NPV)	2712	**2744**

Analyses of Iraqi Service Contract in recpect of Monetise, Stability and Enforceability “3 Pillars” (Park, 2014):

Table 2-21_Analyses of Iraqi Service Contract in respect of Monetise, Stability and Enforceability (3 Pillars)

Right to Monetise	ROC takes all production at transfer point
Stability	Stability needs to be quaranteed in the Contract
Enforceability	Enforceable arbitration provisions are in contract
	Not involved in international arbitration treaties

2.2.4 Joint Venture

A joint venture (JV) includes another company's involvement, usually a national oil company (NOC). The system may be incorporated or unincorporated. While it can be carried into the discovery and construction process, NOC pays its share of expenses. In proportion to their equity contribution, NOC and IOC each receive a share of production and IOC pay royalty and revenue tax. By granting IOC an equity interest, JV establishes the economic benefits of concession but provides oversight of the NOC through the arrangement of co-ownership.

Colombia switched from joint venture to concession, but before they used joint venture contracts and delegated Ecopetrol to carry out those activities directly or under contract with private parties, they used joint venture contracts. The proof of joint venture agreement is the clause: Ecopetrol and The Associate agree that they will carry out exploration and development operations on the land of the Contract Area, that they will share between themselves the costs and risks thereof in the proportion and under the terms contemplated in this Contract, and that the properties they may acquire, and the oil produced and stored will belong to each Party in the proportions set forth hereunder.

The term of the contract was maximum 28 years including 6 years exploration period and 22 years development period. According to minimum work obligation, The Associate will be obliged to perform seismic, drill exploration wells.

If Commercial Field is discovered in the Contracted Area, the area will be reduced to an extension equal to fifty percent (50%) of the Contracted Area.After two (2)

years, the area will be reduced to the Commercial Field(s) area that is productive or under development in addition to a five (5) km wide reservation area around each field. The Commercial Fields plus the zone that surrounds each field will be called the Exploration Area and this will be the only part of the contracted area that will be subject to the terms of this contract.

If Ecopetrol acknowledges the presence of a commercial sector, Ecopetrol will refund 50% (50 percent) of the Direct Exploration Costs to the Associate. This reimbursement is governed by a clause that states that soon: Direct exploration costs shall be reimbursed to the Associate by Ecopetrol as soon as the field is put on production equal to fifty per cent (50 per cent) of its direct share of the total production after deduction of the corresponding percentage of royalties.

The percentage of royalties is 20%. The remainder of the oil and gas generated in the agreed region is held by the parties after the royalty percentages have been reduced. Fifty percent (50 percent) is for Ecopetrol and fifty percent (50 percent) is for The Associate before it exceeds 60 million barrels of oil cumulative output. If the total output exceeds 60 million barrels of petroleum, the remaining petroleum and gas extracted in the Contractual Region (before deduction of the corresponding royalty percentage) is held by the Contracting Parties in the proportion resulting from the application of the R factor as shown in the table below (Smith-Dzienkowski-Anderson-Lowe-Kramer-Weaver, 2010):

Table 2-22_Colombia Royalty Distribution as per R Factor

	Distribution After Royalties	
R Factor	**HC**	**Ecopetrol**
0 to 1	50	50
1 to 2	50/R	100 - 50/R
2 or more	25	75

Equation 2-3_R Factor

R Factor (Seba, 2006)= Cumulative Revenues / Cumulative Expenditures

The possession of rights or interest in the operation of the Contract Area shall be divided as follows: fifty percent (50 percent) of Ecopetrol and fifty percent (50 percent) of The Associate (50 percent). From then on, the Joint Account shall be paid for all expenditures, fees, transactions, costs and obligations carried out and contracted for the success of the operations hereunder, as well as for the investments made by the Associate before and after acceptance of the Commercial Field, for the drilling and completion of wells resulting in production within the field.

2.2.5 Hybrid

It is a mix of royalty, tax, JV membership, shares and fees for oil/profit costs. There are several attempts to establish a host government arrangement with the world model, and host governments are still searching for mechanisms that satisfy their unique needs, as IOCs are not generally prepared to recognize identical fiscal conditions in different countries (Park, 2014):

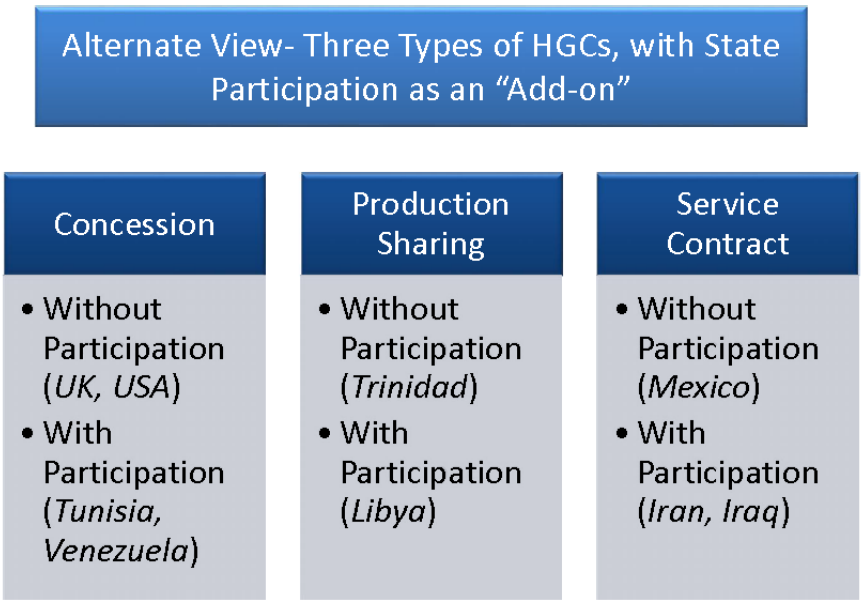


Figure 2-15_Participation of State Company in Countries

All host government contracts provide several generic words in all respects, other than the right to obtain oil and gas output and the fee structure:

- Term,
- Relinquishment,
- Domestic sourcing and supply obligations,
- Operating and management committees,
- Fiscal stability,
- Employment and training,
- Title to assets,
- Development plans and performance guarantees.

2.3 Criterion for Selection Ideal Contract Type

Governments prefer to look at their neighbours when making a decision on upstream private investment systems, but IOCs do not look at the region's investment options, they look globally at their investment options. While service contract structure generally suited for development, reactivation and rehabilitation, concession or PSA structure may be best suited for exploration.

The main concerns of States and Investors for a petroleum agreement (Park, 2014):

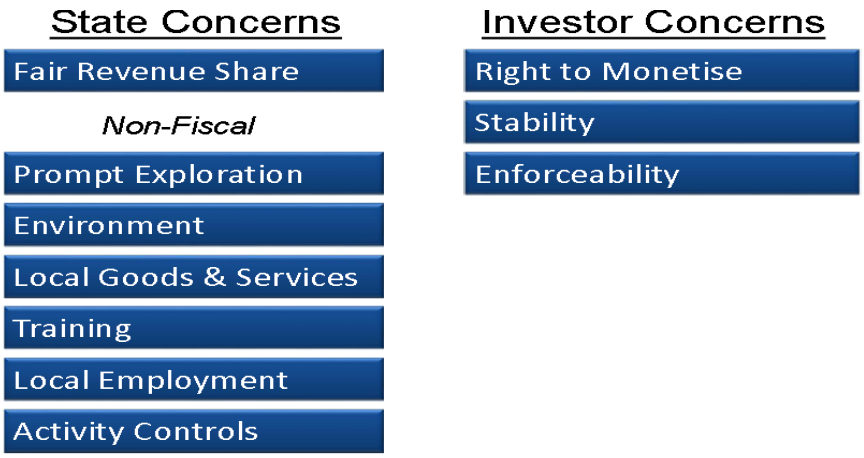


Figure 2-16_State and IOCs' Concerns for Petroleum Agreements

Three key elements of the 'three pillars' of the legal and contract system are of great concern to investors in upstream petroleum activities: the right to monetize, stability and enforceability. The lack of any of these three factors poses a major risk to the investment favourability of the scheme, which can justify the decision not to invest.

An investor in petroleum wants to assess, develop, manufacture, sell and transport oil and gas. Many host government contracts, however, have clauses requiring approval by the government. In order to evaluate the risks involved in obtaining the requisite approvals and remedies available for government failure to do so, the legal and contractual regime must be evaluated (Park, 2014):

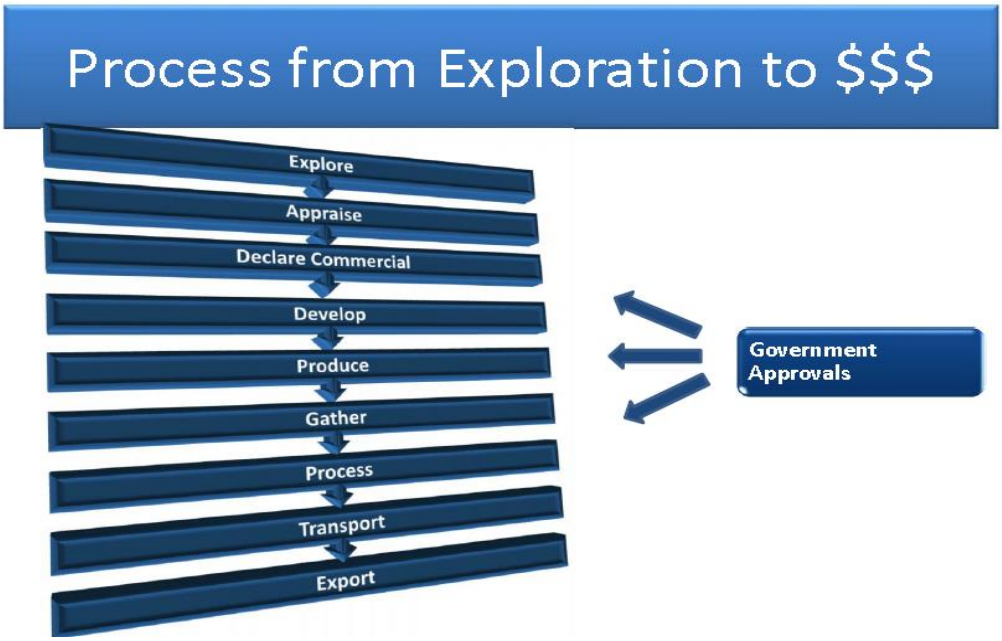


Figure 2-17_Process of Oil & Gas from Exploration to Export

A petroleum investor would want guarantees that the terms and conditions on which it has agreed to invest will remain stable and that the host government will not be subject to unilateral revision. There should be adequate compensation or modification of contract terms if they are changed. The most significant part of this topic is fiscal stability. There are some sources for stability such as Treaties, International Law, Legislation, Host Government Contract.

Treaties are agreements under international law entered into by states and international organization. Multilateral treaties are entered into among a number of parties and bind each party to every other party. Bilateral treaties are entered into between two parties and bind only them. Energy Charter Treaty is an example of a multilateral treaty with stability provisions.

In most upstream petroleum investments, the governing law is the law of the host state. International law prescribes certain legal rules, including a prohibition against expropriation without compensation.

Some states enact general investment legislation that contain stability provisions such as Azerbaijan. It is common to see some type of stability provisions in host government contracts. Stability guarantees may go beyond fiscal matters and include broader potential change in the petroleum regime. There are two main methods for stability provisions: Freezing and/or economic re-balancing provisions.

The below term is an example for partial freezing from Chile (Park, 2014): " The tax regime, benefits, privileges and exemptions provided in any of articles herein, which shall be recorded in the special operation contract, shall remain invariable for the duration thereof".

Any stability provisions state that a re-balancing will take place if the host government adopts a measure that is likely to have adverse effects on the economic benefits of one or both parties. It has often been the case that stability guarantees do not cover all of the potential actions that a state might take which can affect the investor in a negative way.

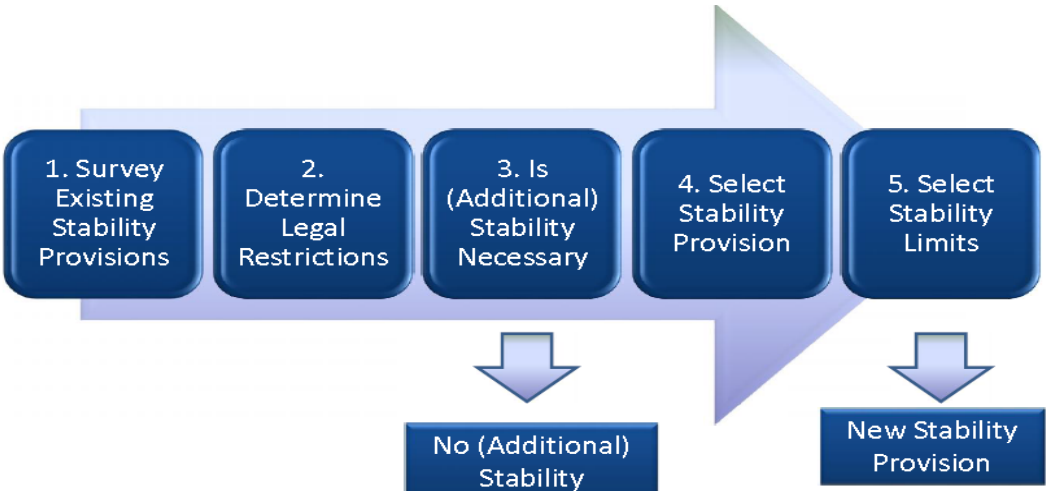


Figure 2-18_Stability Provisions for Petroleum Contracts (Park, 2014)

International arbitration is now the norm for the resolution of disputes under upstream petroleum contracts. An investor, at the start of an investment, faces high risk and uncertainty of success and is awarded a premium in terms of, for example, rate-of-return which reflects this. The risk decreases, sometimes significantly, until the bulk of the investment is sunk and the investment is efficient, and the host government tries to renegotiate the level of return in its favor, to the detriment of the investor who, as a result, experiences a loss relative to the original terms.

A feature of the attractiveness of geology and the balance of the fiscal system is the relationship between government adoption and encouragement of investors. The tougher fiscal terms are the most attractive resource base. For a competitive framework, this is common. When the viability of the venture shifts, various fiscal structures yield various outcomes for the host state and the investor. Regressive systems offer the state a smaller share of profits as profits grow (royalties, bonuses, rents). Neutral regimes owe the state the same share of profits as profits grow (fixed share profit sharing, corporate income tax, and participation). Progressive regimes offer the state a larger share of income as profits grow (R factor formula, ROR based profit sharing). A synthesis of these characteristics requires hybrid regimes (sliding scales applied to production sharing, royalties).

The level of government is dependent on project features (exploration, production or growth, secondary or enhanced recovery, local market gas development), resource features (low/high cost or net back), government policies (competitive/encouragement, level of direct participation).

Of course, exploration is encouraged with favorable terms for investors with major findings on the upside. Relevant acts to encourage exploration:

1. No signature bonuses
2. No high rentals during exploration
3. Full consolidation for CIT
4. 100% deduction of exploration expenditures when costs are incurred for CIT
5. High cost oil/gas limit
6. Avoid carried interest
7. Import duty exemption for exploration
8. Proper VAT refunds.

In general, cost-effective activities are encouraged by the avoidance of high marginal tax rates and gold plating.

Gas development is promoted by offering fiscal incentive for gas, such as:

1. Lower royalties for gas
2. High depreciation rates for CIT for gas pipelines
3. High cost gas limits and lower profit gas shares
4. Making gas exempt from special taxes such as SPT or excise taxes
5. No carried interest for gas fields

In general, the avoidance of high marginal tax rates and gold plating is facilitated by cost-effective operations. Also under the best circumstances, because all is unknown, this is a difficult mission. With a standard E&P venture graph, you can visualize the value of an exploration and/or development venture (Seba, 2006):

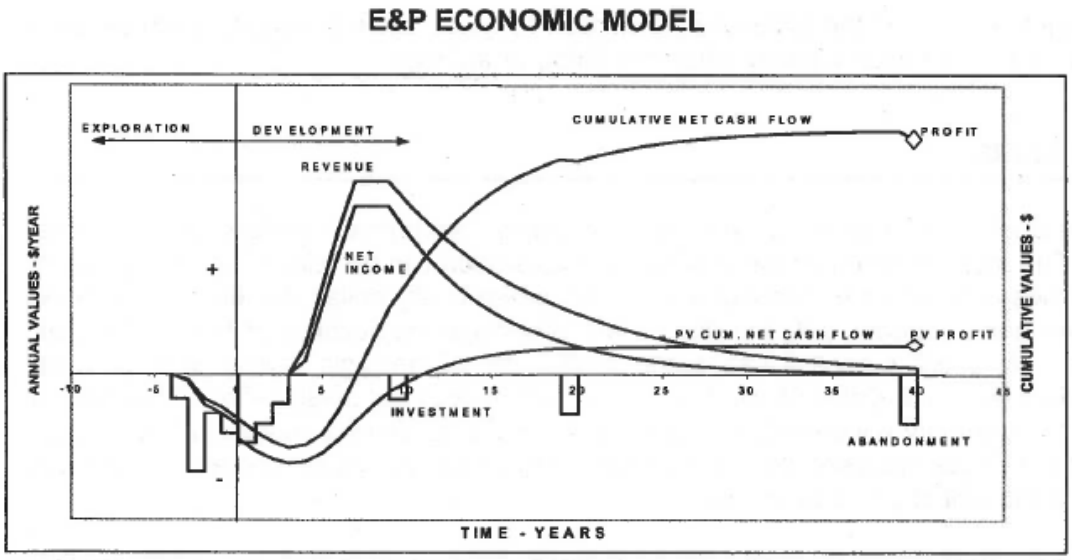


Figure 2-19_Exploration & Production Economic Model

The discovery date is shown as time zero merely to separate the exploratory phase from production phase of the project. Exploration and growth expenses are seen to be negative and optimistic in terms of sales and net profits. It illustrates the many years of investments that precede any revenue from successful projects and that the creation of newly found reserves requires additional development capital. On the graph, total cash flow is included, and where that line crosses the zero axis, the payoff of the investments is visible. The final point of the accumulated cash flow curve is the ultimate benefit that the project can produce. Additionally a curve labelled cumulative PV cash flow is also presented which is the present value of the cumulative cash flow, discounted at the corporate hurdle rate to time zero. The end point on this curve is the PV net cash flow of the E&P project.

2.3.1 Field Evaluation

Sometimes, when little if any information is known on which to base such forecasts, forecasts need to be made. When evaluating the economics of an exploration prospect or the creation of an exploratory discovery, this is typically the case. It is useful to find a generating field under these conditions that appears to be equivalent

to the prospect or discovery and can be used as a model for its assessment. The production field will provide the basis for the production model, expected reserves, on-the-spot oil, efficiency of recovery, energy from the natural reservoir, or any other information required to establish the production forecast. Capital and operating costs can also be forecast from experience of actual producing operations. The best reservoir analog are those of similar geologic age and setting, but do not necessarily need to be near-by. Onshore fields could be used as models for offshore prospects, as long as offshore costs are used in the economic evaluation.

For instance (Seba, 2006), there is a major correlation in per-acre recoveries within the West Texas group of volumetric San Andres reservoirs; or, again, the per-acre recoveries from the Michigan Basin Niagaran Reef fields; or another comparable category, the per-acre-foot recoveries of the Texas Gulf Coast Frio Sands.

2.3.2 Cost of Failure

Failure may be due to many of causes and may range from human carelessness to natural catastrophes. The most common cause of failure in exploration can be related to geologic problems. For countless reasons the prospect may be dry when finally drilled. No matter how good the geologic evidence appears, only the drill bit will determine the success or failure of a geologic prospect. So every prospect has some probability of geologic failure and for most prospects this is a fairly high value. While exploration failure does not persist after a discovery is made, geologic uncertainty will persist throughout the producing life of a prospect affecting producing rate and ultimate recovery. Actual reserves discovered will not be known until the last barrel of oil or cubic foot of gas is produced.

Additionally, mechanical failure must also be considered. This would include minor failures that would merely add to the drilling cost all the way to a well blowout or natural disaster, such as a storm or earthquake, which would completely obliterate the prospect. Mechanical failures are not limited to the exploration phase of a project,

but should be considered throughout the entire life of the project. Sound engineering and technological implementations may reduce these risks, but the cost may be too high to totally eliminate them.

Political failure is also of real concern when seeking to acquire exploration and production rights. Since the producing life of a typical oil field is very long, many things of a political nature can occur which will have a serious impact upon the economics of an exploration prospect. Tax rates and even entire tax systems may change. Political parties and forms of government may shift. Political philosophies may vary and contracts voided. All of these factors should be considered as the contract is negotiated, making every effort to minimize the adverse effects of future political changes through appropriate contract terms and wording.

2.3.3 Expected Value

The approach to Expected Value is a way of integrating quantitative probability estimates, i.e. uncertainty of any of the alternative elements that constitute an investment opportunity. This allows for the determination of a risk-adjusted decision criterion, known as the expected value, or sometimes the expected monetary value (EMV). In the petroleum industry, these concepts are commonly used when applying the principle of Anticipated Value to project evaluation in a risk setting.

Expected Value blends each alternative with quantitative probabilities (estimates). The parameter is calculated for all the possible results as the sum of the mathematical product of the likelihood of each outcome times the value of that outcome. For projects which have regular repetition, it is reasonable to use expected values. The predicted return would provide a more accurate indicator of the actual return over several repetitions. Nevertheless, with the available data, the industry must operate. The estimation of expected value will at least serve as a helpful guide to highlighting and guiding one away from potentially unprofitable initiatives and suggesting future changes in the decision-making process.

For each option, an Expected Value analysis involves the identification of two or more effects. However, all potential findings for the alternative being tested must be included in the results defined. Any of the potential results must have a certain finite probability of occurring, but none can be certain of occurring. The probabilities assigned must be proportional to the probability of the occurrence of that particular event, and the sum of all such probabilities must add up to one.

Uniform distribution is the least specific probabilistic model. It only requires the decision that values will occur between two limits and recognizes that any value in this range is equally likely to occur. It gives equal weight to the minimum and maximum values when calculating the expected value.

2.4 OFFSHORE LICENCES IN MEDITERRANEAN & BLACK SEA

2.4.1 Pre-qualification & Tender Process

2.4.1.1 East Mediterranean

In the east part of Mediterranean, there are some major countries which are very active for development of deepwater licences: Egypt, South Cyprus, Israel, Lebanon and also Turkey. In the territorial waters, each country announced own economic zones which are coincide with others, therefore there are some conflicts between them.

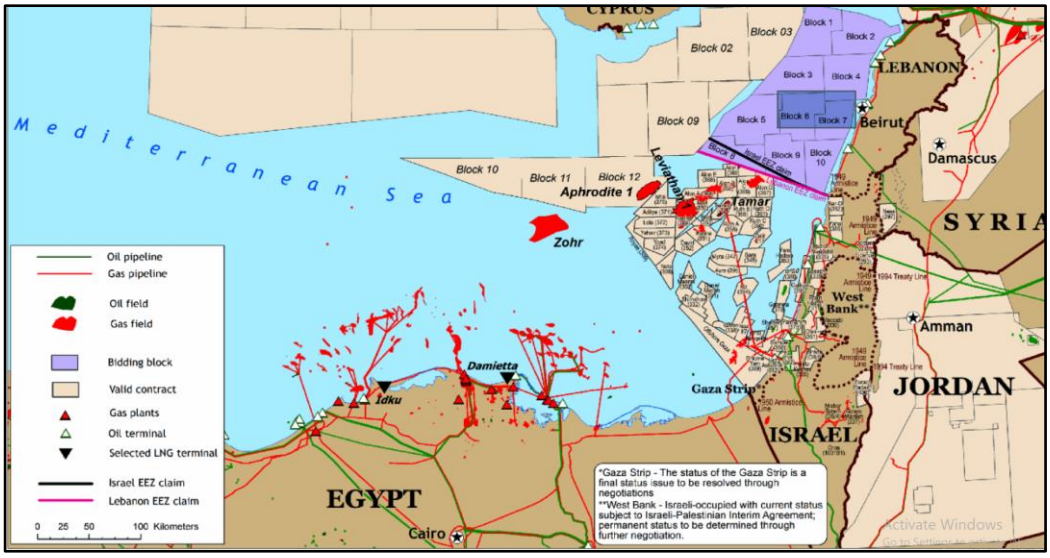


Figure 2-20_Eastern Mediterranean Oil and Gas Geography (Energysea, 2016)

Lebanon has chosen competitive bidding with respect to the tender approach, which is an anticipated step as this method is increasingly common and endorsed by the IOCs.

Lebanon's offshore oil and gas sector is governed by the Offshore Petroleum Resources Law (OPRL, Law 132 24/8/2010), the Petroleum Activities Regulations (PAR), and the Exploration and Production Agreement (EPA) (SemanticScholar, 2019). There is no other legislation that would be established to cover activities onshore. One rule applies to both onshore and offshore in most countries.

The OPRL refers to the award of licenses by licensing rounds, but the terms of the offer are not specified. While Lebanon has not yet made any discovery, the interest shown by the IOCs in the country and the findings made in neighbouring countries (Israel, Egypt and South Cyprus) build a suitable competitive bidding ground. In addition, the Government of Lebanon has attempted to minimize, but not eradicate, the perception of danger in its unexplored waters through the preparation of detailed data packages marketed to interested companies. Access to information will increase competition, especially as risk-averse bidders are more actively induced to bid.

Lebanon has adopted a rather prescriptive approach to awarding licenses. For instance, to qualify, applicants should satisfy a set of legal, financial, technical, quality, health, safety, and environment criteria, as shown in below table. The pre-qualification conditions that the country specifically chose created a bias against large oil firms, the reason being that the oil and gas resources of Lebanon lie in deep water and the skills and money to exploit them was available to the larger players.

Table 2-23_Lebanon Prequalification Criteria (Lebanese Petroleum Administration)

	Legal	**Financial**	**Technical**	**QHSE**
Operator	Joint stock company conducting petroleum operations	Total 10billion USD Assets	Operatorship experience in water depths more than 500m	QHSE Policy Statement
Non-Operator	Joint stock company conducting petroleum operations	Total 500Million USD Assets	Having an production field	QHSE Policy Statement

The EPA is concluded, according to the OPRL, between the State and the operator, which consists of at least three right holders. Lebanon also allows the operator to maintain a minimum participation interest of 35%, while a minimum of 10% is expected for each non-operator. Companies pay a license application fee of $50,000.

Pre-qualification applications were submitted by around fifty-two international oil companies and forty-six were shortlisted. These include major oil companies such as Shell and ExxonMobil that meet the relatively strict financial and technical requirements for pre-qualification in the country. Although such a high level of international interest is definitely a positive development, it is also not unprecedented, especially because oil and gas companies are constantly seeking new

opportunities. In addition, given that the minimum number of right holders should be three, the total number of consortia that can therefore be formed will be lower than the total number of pre-qualified companies. However, when they begin to bid, the number of pre-qualified bidders will decrease. In this case, Iraq's fourth round is a good example. Iraq has %1.9 of world proved gas (BP Statistical Review, 2014) and they announced a 4th round for 12 exploration blocks. However, when the terms were revealed, only eleven firms bid on four blocks. Only three blocks were awarded eventually. Algeria also announced the 9th licensing round in 2011, which a country has proven to have oil and gas fields, resulted in only two out of ten licenses being awarded.

In South Cyprus, The Hydrocarbons (Prospection, Exploration, and Exploitation) Law and regulations for oil and gas activities were passed into law in 2007 and 2009.

A competitive bid for alleged licences was announced by South Cyprus, the first round was completed in 2007, but three applications were made by two parties for three out of 11 blocks: one to US-based Noble Energy and the other to a consortium of Norwegian, United Kingdom and United Arab Emirates companies. After the exploration license was issued in 2008 for Block 12, where Cyprus's first offshore gas discovery, Aphrodite, was later made in 2010, Noble Energy is very interested in the area. After measurement, the size of the field had a gas average of 5 trillion cubic feet (tcf). After discovery of the Aphrodite field reversed the tide in favor of the government, a second round was announced in 2012 for 12 offshore blocks. Interest was shown by ten consortiums (25 firms) and five companies. Noteworthy was the strong interest of Israeli firms. As a result of tender, five contracts were signed with Italian Eni and South Korea Kogas for Blocks 2, 3, and 9 and with French Total SA for blocks 10 and 11 (SemanticScholar, 2019).

Unlike Lebanon, there was no limit on the minimum number of holders of rights. In the second round, both single companies and consortia, ranging from two to five companies, large and small alike, submitted applications. In terms of pre-qualification conditions, Cyprus has also offered more flexible rules than Lebanon.

In addition to national security concerns, the prequalification conditions for applicants were, according to the island's oil and gas regulations:

- Technical and financial ability
- Management strategy of project
- Financial sources and considerations
- Efficiency and responsibility

If any bidder show interest more than one licence, it was mentioned which one has priority for bidder. In respect of evaluation criteria, South Cyprus preferred to negotiate all fiscal and non-fiscal terms which was an extreme tender in the world. The work program, signature and output incentives, cost recovery ceiling, petroleum benefit, and training fees were also included in these requirements. Sadly, this mechanism has established numerous fiscal regimes and job programs that do not make it comparable and place considerable administrative burden on the government.

Compared to Cyprus and Lebanon, Israel discovered the first oil and gas potential field earlier in 1999. After discovery of Noa Field in 1999, they continued with new discoveries such as Mari-B field in 2000, Dalit and Tamar in 2009, Levitian in 2010 and Tanin in 2011. Tamar was the largest discovery in 2009 in the world and its production was initiated in March, 2013. Also Levitian with a 22 tcf gas reserve was the largest discovery in the world over the past decade (Energysea, 2019).

Israeli petroleum law was adopted in 1952 and revised in 1965, and the "Petroleum Regulations" Principles for Offshore Petroleum Exploration and Production were also adopted in 2006 for the offshore and the Natural Gas Sector Law, which governs investment in the sector, was established in 2002.

Major oil and gas exploration companies are hesitant to invest in Israel because they do not want their investments in other Arab countries to be affected. For Israel, as in Sudan, Bolivia, Myanmar, and Sierra Leone, political risks are also very high. In

spite of such political risk of Israel, they made big discoveries in last ten years (SemanticScholar, 2019):

Table 2-24_Natural gas discoveries in the Eastern Mediterranean region

Country	**Discovery Year**	**Name**	**Size (TCF)**
Cyprus	2011	Afrodite	7
Israel	1999	Noa	0,04
	2000	Mari-B	1,5
	2009	Dalit	0,5
	2009	Tamar	10
	2010	Leviathan	18
	2011	Dolphin	0,08
	2012	Simson	0,3
	2012	Tanin	1,2
	2013	Karish	1,8
	2014	Royee	3,2
Palestinian Territories	2000	Gaza Marine	1

As per the Israeli cabinet decision to guarantee domestic supply for the next twenty-five years, gas exports stood at 40 percent in September 2012. For potential gas exports, additional taxes have also been levied. For businesses searching for the most economically efficient solution to exploit gas resources, strong public feelings against exporting gas may serve as a disincentive.

Regulations and fiscal regimes for upstream oil and gas were revised between 2000 and 2013, adversely affecting the confidence of investors. In 2000, all offshore operations were suspended by the Israeli Ministry of National Infrastructure (which later became the Ministry of Energy and Water Resources) to allow the government to consider amending the legislation and the fiscal regime. The field was opened up to new exploration more than six years later. The Israeli government further

implemented stringent legislation and tightened its fiscal terms after the discoveries of Tamar and Leviathan.

Like Cyprus, there are no conditions that can be given to one or more parties about the number of applicants per petroleum right. But Israel's petroleum laws are strongly prescriptive, in strong contrast to Cyprus. For example, as a pre-condition for granting petroleum rights covering offshore areas of varying water depths, the regulations require some minimum skill standards in offshore exploration and production activities:

- Experience of drilling at least one offshore well for a license in which the water depth does not exceed 100 meters
- Experience of drilling at least one well at a depth of more than 100 meters for a license in an area where the water depth reaches 100 meters.

The regulatory reforms made in 2010 mandated, for the first time in the last five years, the selection of an operator with experience in the management and execution of at least one $100 million offshore project. They also set the requirements for assessing the minimum financial potential of an applicant who is supposed to be able to finance at least half of the approved project's projected cost of $100 million (Ratner, 2016).

Additional qualifications for drilling in water depths of up to 500 meters, up to 1,000 meters and above 1,000 meters were added to the current qualification criteria in 2011. The operator must be an oil and gas partner and have at least a 5% stake in the license, while international operators must apply a questionnaire on their foreign trade and relationships.

The regulations restrict the maximum size of an offshore right to 400 square kilometers and no individual shall hold more than 12 licenses or hold licenses for a total area of more than 4000 kilometers in excess. For instance, the Pelagic Licenses awarded to Israel Opportunity Energy Resources LP, covers five blocks of 400 Km2 each, resulting in a total area of 2,000 Km2 (SemanticScholar, 2019).

If compared to Israel and S. Cyprus, Lebanon appears to give the shortest period of the exploration process (five years compared to seven in S. Cyprus and Israel, excluding the possible extension for appraisal). Lebanon, however, provides the longest length of time between them when the potential exploration extension period is included. Initial period is three years for the discovery and development period, and 2nd period is two years. The right holders relinquish 25 percent of the block at the end of initial period (SemanticScholar, 2019):

Table 2-25_Duration of petroleum rights in Cyprus, Israel and Lebanon

Exploration	**Lebanon**	**Israel**	**Cyprus**
Initial period (years)	3	3	3
2nd period	2	N/A	N/A
1st renewal period		up to 4	2
2nd renewal period	N/A	N/A	2
Total excluding appraisal	5	up to 7	up to 7
Extension for appraisal	5	up to 2	0,5-2
Total	up to 6	up to 9	7,5-9
Exploration Phase extension	totally 10		
Relinquishment rule	%25-50*	up to %40	at least %25
Production	**Lebanon**	**Israel**	**Cyprus**
Phase 1: Initial Period	25	30	25
Phase 2: Extension/Total	5/30	20/50	10/35

*25% of Area must be relinquished at the beginning of second exploration period; 50% of Area (cumulative) must be relinquished in case of extension of exploration Phase.

Time differences for the evaluation span between three countries; one year, two years and two years respectively, Lebanon, Israel and Cyprus. There are also some distinctions between block sizes. As per the table below, The largest block sizes are available in S. Cyprus, while the smallest ones are in Israel. Lebanon has divided its

offshore area into ten blocks, covering what Israel claims to be a disputed area of 854 Km2. The size of the blocks, however, has been criticized as too large. In practice, there is no ideal block size: The geological risk, the type of opportunity, and the relinquishment rules should all be taken into consideration.

Table 2-26_Size of Block Areas in km2 (SemanticScholar, 2019)

	Lebanon	**Israel**	**Cyprus**
Minimum	1259	128	1440
Maximum	2374	400	5741
Average	1790	369	3920

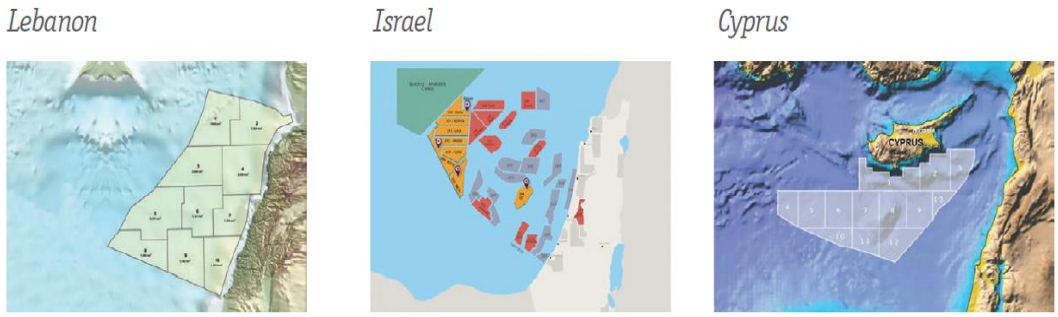


Figure 2-21_Comparison of offshore block delineation in Eastern Mediterranean (SemanticScholar, 2019).

2.4.1.2 Black Sea

Romania is the seventh largest by population, ninth largest by area and 13th largest by Gross Domestic Product of the 28 European countries. It is also one of the largest producers of oil and gas in Central and Eastern Europe, with over 150 years of long-standing history in this region. In 2004, the state-owned oil company Petrom SA privatized a 51 percent stake in Austria's OMV Division. On this occasion, the previous petroleum legislation from 1995 was replaced by Petroleum Law 238 of 2004 (Econet Romania, 2014). A 10-year stability provision that expired at the end of 2014 was included in the Petrom privatization deal.

Like other European countries and North America, the concession scheme is actually used in Romania. The fiscal regime in Romania includes the following (Auty, 1993):

- %16 Income taxes
- Charges (royalties depend on production, income from gas storage and pipeline transportation of crude oil)
- %24 VAT
- 4 euro/ton applied on oil sales
- %1,5 building tax
- %60 temprorary surcharge while granting deduction if exceeding %30 investment.

In Romania, there are 80 different types of taxes, royalties are not set and depend on the size of the oil field and oil prices. In 2014, the Romanian Government ended freezing royalties, so the government of Romania is preparing to replace a new fiscal regime. The Romanian government has announced that it plans to amend the fiscal requirements for oil and gas operations, but the procedure has not yet been completed.

In 1975, Romania began offshore exploration in the Black Sea, and offshore oil production began in 1987. It is estimated that the Domino-1 natural gas field contains 70 billion cubic metres (2.5 trillion cubic feet) of dry natural gas, equal to almost half of Romania's current proven reserves of natural gas. A second deep-water well was drilled at a depth of about 800 meters in July 2014 to test the economic feasibility of the Domino gas field. While still evaluating the data from the drilling activity in the Neptune block, in October 2014, OMV Petrom and ExxonMobil started drilling a third deep-water well in the Black Sea. In addition to the Domino discovery, in July 2014, the exploration well Marina-1 was found oil with potential production per well of 1,500-2,000 barrels per day (Offshore Energy, 2014).

Lukoil and PanAtlantic Petroleum and the Romanian national gas company Romgaz declared in October 2015 a significant discovery of natural gas in the Trident field,

which could theoretically contain more than 30 bcm (1 tcf) of gas, to be verified by further drilling assessments scheduled for 2016 (Offshore, 2015).

2.4.2 Fiscal Regimes

OPRL released a PSA for offshore licenses in Lebanon, but it looks like a hybrid because it combines a royalty with a share of benefit. The key findings of Lebanon's fiscal regime are royalty, cost recovery, profit sharing between the government and the resource production business, income tax, and state involvement.

While royalty on oil is depend on a sliding scale varying with incremental daily production, royalty rate for gas is flat as %4 (SemanticScholar, 2019):

Table 2-27_Sliding scale royalty on oil in Lebanon

Oil Production bbl/day	**Royalty Rate (%)**
<15,000	5
15,001-25,000	6
25,001-50,000	7
50,001-75,000	8
75,001-100,000	10
>100,000	12

As per EPA, Contractors has to pay 300,000 USD per year (%5 increment) till production phase, then it will be 500,000 USD per year with same increment which are recoverable. Another regulation which is not easy to achieve for Contractors is to reach %80 of local personnel after production phase because of limited expertise on gas and oil industry in the country. EPA in Lebanon maintain its right to assign a state company after commercial discovery. This is not favoured by the IOC because the carrying state participation increases the cost recovery cycle as the carrying costs are recovered from the equity share of production of the state/NOC before the carry

is repaid. Government take would be in line with the global average of 65 to 85 percent by considering IMF advice and attracting IOCs, a significant point for the Lebanese PSA.

In S. Cyprus it is not easy to compare contractual and fiscal terms since no signed contract was made public, but S. Cyprus's contract is also a PSA which does not has a royalty but imposes signature and production bonuses. It could be because urgent need of cash in economic crises period. Profit sharing was settled as per R factor and government imposes a cost recovery ceiling. The general CIT rate is imposed on the contractor's share of profit petroleum but it is paid on its behalf.

In the 2012 Model Production Sharing Agreement was released in connection with the second licensing round, the following terms were set out (SemanticScholar, 2019):

- Signature and production bonuses: the former shall be paid within thirty days after the date of success of the contract, while the latter shall meet the bidable production thresholds within thirty days after the average daily production from the contract area, calculated over sixty consecutive days.
- The price recovery limit is open for bidding. Unrecovered expenses can be carried forward indefinitely until they have been completely recovered, but not past the contract term.
- Profit sharing is bidable; it is performed on an R-factor-related bidable, incremental sliding scale.
- R-factor = Cumulative Net Revenue / Cumulative Capital Costs where:
    - Cumulative net income is the cost recovery of the contractor plus profit share minus operating expenses incurred from the beginning of the project to the end of the previous quarter.
    - Cumulative capital costs are the research and construction capital costs incurred by the contractor from the beginning of the project to the end of the previous quarter.

- Profit sharing was based on an incremental sliding scale linked to the average daily life under the 2007 Model Agreement used for the First Licensing Round. Rates of production and the price of oil.
- CIT: Under the Cypriot income tax law, there is no clear regime affecting the oil and gas industry. The CIT is paid by the state from its production share; it is 10% of the usual CIT rate . Confusion emerged in the second licensing round when, following continued claims by the Ministry of Commerce that "no tax is payable" on oil and gas output revenues, the model PSA was issued without a tax clause.
- Training Fee: For the training of Cypriot civil servants, the contractor is expected to contribute negotiable/biddable quantities. In the periods before and after the declaration of commerciality, the amounts can vary. Training charges are recoverable expenses.

Israel proposed favorable tax conditions for IOCs at the beginning before any discovery. After findings, however, they tighten regulations and fiscal conditions.

The concessionary regime in Israel was not altered until 2011. For IOCs, the older version was very favorable, and the government took about 30 percent, which was the world's lowest.

The Sheshinski Committee was formed by the finance minister in 2010 to investigate the country's petroleum fiscal regime. The committee found that the existing structure does not sufficiently represent the ownership of its natural resources by the public. The draft recommendations of the committee recommended two important improvements to Israel's tax treatment of the oil and gas industry (SemanticScholar, 2019):

1. The committee eliminate depletion deduction since it caused a deduction from taxable income around %27.5.
2. Execute a progressive special profit tax based on R-factor between 1.5-2.3. The tax rate is between %20-%50 when cumulative net income is %150 of exploration and production costs.

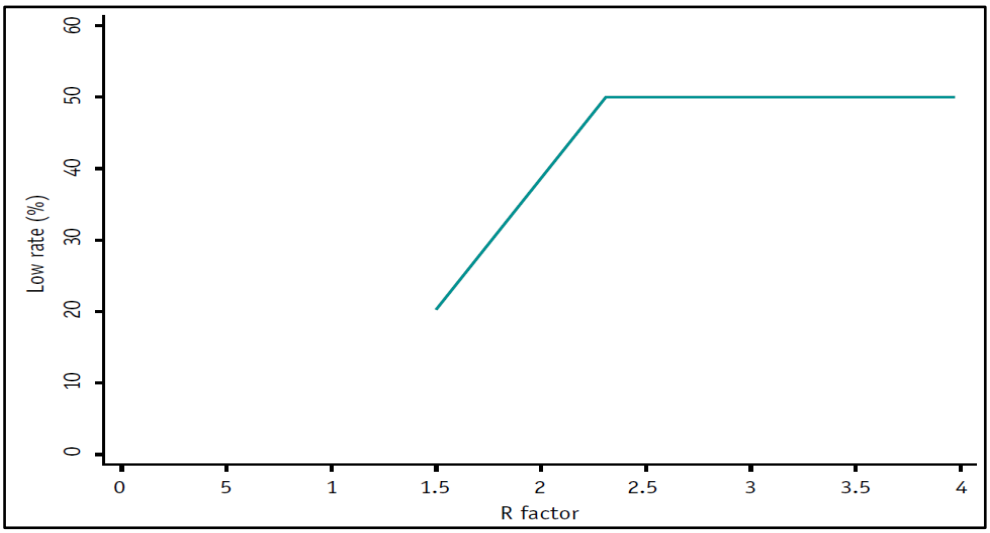


Figure 2-22_R Factor & windfall tax rate

3. Royalty rate was fixed at %12.5. Also income tax rate is around %26.5.

As a consequence, the government takes about 52 percent-62 percent, which is below the world average, and Israel's fiscal regime has been recognized as one of the world's most egalitarian regimes.

A scheme of gross royalties for both oil and gas is being tested by the Romanian government, with rates ranging from 3.5 percent to 13.5 percent of oil output revenue and 3.5 percent to 13 percent of natural gas revenue, depending on field productivity. The royalty scheme is valid for the length of a concession agreement of up to 30 years, with the option of an extension of up to 15 years. In spite of the significant difference in cost, risk and time frame between these types of operations, the current fiscal system does not differentiate between traditional and unconventional activities, onshore and offshore. One of the expectations from the new petroleum legislation is that it will differentiate between conventional onshore and offshore projects and will tailor their fiscal treatment to their specific characteristics.

Table 2-28_Summary of Fiscal Terms

Countries/Fiscal Terms	**Lebanon**	**Cyprus**	**Israel**	**Romania**
Type	PSA	PSA	Concessionary	Concessionary
Royalty	%4 gas, %5-12 sliding scale with production	None	12,50%	Oil: 3,5% - %13,5 of gross production 3% derived from underground storage gas 10% of revenue for transportation
Signature Bonus	None	Applied for initial tenders	None	None
Production Bonus	None	Applied for initial tenders	None	None
State Participation	Applicable but not in 1st round	None	None	None

Table 2-29_Summary of Fiscal Terms (Table 4-6 Continued)

Countries/Fiscal Terms	**Lebanon**	**Cyprus**	**Israel**	**Romania**
Windfall Tax	None	None	%20-50 R factor based	• Natural gas: 60% fee on supplementary revenues obtained from the deregulation of prices in the natural gas sector • Oil: 0.5% of revenues for companies exploiting natural resources, with the exception of natural gas
Cost Recovery Ceiling	Biddable	Biddable	None	None
Profit Sharing	Biddable	Biddable 1st round based on production 2nd round based on R factor	None	None

Table 2-30_Summary of Fiscal Terms (Table 4-6 Continued)

Countries/Fiscal Terms	**Lebanon**	**Cyprus**	**Israel**	**Romania**
CIT	15%	10%	26,50%	16%
Training Fee	Up to 300,000 USD/year until beginning of production, 500,000 USD/year (%5 increment per year)	Biddable	None	None
VAT	None	None	None	19%
Withholding Tax	None	None	None	16% for IOCs

CHAPTER 3

STATEMENT OF PROBLEM

More than one hundred years, the Host Countries have been trying to find a way for increasing benefits from O&G resources. For that reason, development of petroleum contracts has never stopped. Even inventors of each model, such as the US, which created concession agreements, and Indonesia, which first used PSA model, modified their regulations and contracts many times by increasing government takes, shortening contract periods, narrowing size of license areas etc., to keep up with other factors like increased production levels or petroleum prices. One of most important thing in last decades, Host Countries extended boundaries of each contract type by adding some different terms and clauses.

As per Regulations of Turkey, concession type was selected for Turkey petroleum and gas licences for onshore and offshore. As known that there was not any big oil and gas discovery in Turkey before starting deepwater operations, however deepwater wells could be a new opportunity for Turkey to find some new giant discoveries. However, deepwater drilling activities and related investments to transport oil and gas and construction of surface facilities will need huge amount of investment. Most of the host countries prefer to share risks of exploration activities and big expenditures with international oil companies (IOCs). In order to create a desirable atmosphere for any investor, HCs should select the most appropriate contract model and set regulations accordingly. Turkish Petroleum Law and Regulations was prepared as per former market conditions which were no oil and gas discovery in Turkey, no own drillships for deepwater operations, no deepwater operations actually. Now NOC of Turkey (Turkish Petroleum Corporation “TPAO”) announced a discovery in Blacksea, has 3 Drillships of 20 in the World which are actively in operational. Therefore petroleum law, related regulations and current fiscal regime need to be reviewed and re-arranged as per the conditions stated above.

While making necessary changes, petroleum laws and regulations of neighbouring countries must be reviewed and taken into account for competity. We should know how they managed this process before/after announcing an oil and gas discovery and which contractual changes were made to get more benefit from these sources by decreasing expenditures of countries. The main aim of these changes are not only decreasing expenditures but also gaining some experience, training local personnel and receiving some new technologies to country.

In the last part of the thesis, Petroleum Law of Turkey, current contract model and fiscal regime will be re-examined and compared with neighbours such as Lebanon, Israel, S. Cyprus and Romania. According to Petroleum Law of Turkey, some fixed rates are applicable for royalty ratio, income tax and total government take. However sliding scale royalties, R-factor based profit sharing are mostly preferred by HCs in last decade in order to increase government take in the later stages of production phases and decrease expenditure in exploration phases. While making these achievements for HCs, a promoted market conditions must be one of main objective. Moreover, fiscal regime selection could be re-considered after oil and gas discovery since most of oil-rich countries has changed concession with PSA or hybrid type. Finally, R-factor based sliding scale royalty case will be exemplified with a sample deepwater project in order to understand advantages of this system.

CHAPTER 4

PETROLEUM LAW & REGULATIONS OF TURKEY

The Petroleum Law No. 792, which was passed in 1926, was the first Turkish legal legislation concerning petroleum. The Turkish State retained exclusive authority to perform petroleum exploration and development activities under Law No. 792. As a result, there were no incentives for foreign investment in the law. Petroleum Office was established under the Ministry of Trade on February 14, 1941 to carry out petroleum-related activities.

Petroleum Law No. 792 was replaced with Petroleum Law No. 6326 which came into force on 16 March 1954. The Turkish Petroleum Corporation ("TPAO") was established in the same year. TPAO's activities included petroleum exploration, drilling, development, refining, and transportation, as well as the purchase, selling, and distribution of petroleum and petroleum products. The new law made it possible for both domestic and international companies to participate in petroleum activities in Turkey. However, as progressive as Petroleum Law No. 6326 was at the time, it was not enough of an opportunity to attract the required levels of investment into Turkey's petroleum exploration and production activities. This was largely due to the persistence of legislative constraints and bureaucratic roadblocks. As a result, the Turkish legislative tried to replace the Law with a new one that could respond to the investors' needs while also providing incentives.

In 2003 and 2005, Petroleum Market Law and Liquefied Petroleum Market Law were enacted respectively.

The Turkish Parliament passed Turkish Petroleum Law No. 5574 on January 17, 2007, in order to create a more transparent and competitive legal and regulatory system. The Turkish President, on the other hand, vetoed the law, claiming that it did not adequately safeguard Turkey's national interests. The following were the reasons

for the veto, and it should be remembered that much of the issue was about the country's national interests.

On June 11, 2013, the new Turkish Petroleum Law No. 6491 took effect, replacing the previous Petroleum Law No. 6326, which was enacted in 1954. The new Petroleum Law aims to ensure that the Turkish Republic's petroleum resources are explored, established, and generated in a timely, reliable, and efficient manner consistent with national interests. The new Petroleum Law's key goal is to eliminate barriers to attracting foreign investment. As a result, the Law seeks to eliminate bureaucracy, simplify application processes, create incentives for exploration and development activities, lower prices, and create a more competitive climate. The major rights and incentives are in the new law (Akın Law Office, 2014):

a) Income Tax: The amount of the income tax deductions owed on the petroleum right holder's net income and the income tax withheld on behalf of its owners will not exceed 55 percent.
b) Tax exemption: Oil and gas field machinery manufactured and sold locally is excluded from customs duty, levies, and stamp tax. The exemption can continue even if the materials that are subject to exemption are transferred from one petroleum right holder to another with the approval of the General Directorate.
c) Exemption from Certification of Compliance for Imported Goods: Materials that a petroleum right holder has imported to use in petroleum operations that have been licensed by the General Directorate are not subject to a Turkish Standards Institute compliance evaluation.
d) Foreign employees: Excluded from normal work laws for a six-month duration and can work in Turkey if they receive a residence permit.
e) Permission to Build a Pipeline: An operation license holder can be given permission to construct a pipeline to transport the petroleum it produces upon request.
f) Right to Repatriation of Registered Capital: The new Law also eliminates restrictions on capital repatriation. By filing an application with the General

Directorate, the holder of a petroleum right can transfer their cash funds and rights thereto, as well as economic assets, tax-free, either in cash or in kind, and after putting aside the amount needed for the payment of any taxes, duties, charges, and royalties owed to the State.

g) Right to keep the income in return for exportation of petroleum outside Turkey: The foreign currency produced by the petroleum export can be kept by the holder of a petroleum right abroad. This number will be deducted from remittances of capital imported into Turkey and transfers of net values in excess of it.

h) Right to Export Petroleum Products: Petroleum right holders are allowed to export a certain percentage of the petroleum and natural gas generated in fields discovered after January 1, 1980 (35 percent onshore and 45 percent offshore). The remaining portion, as well as the entire amount of petroleum and natural gas generated in fields discovered prior to January 1, 1980, must be kept for domestic use. The process and principles for redetermination and application of these ratios are controlled by the Council of Ministers.

As mentioned above, Turkish Petroleum Law (No:6491) was published on 30th of May, 2013. The Petroleum Regulation was also renewed in 2014. The former version of Petroleum Regulations was published in 1989 and it had been effective till 2014. Main objective of new Petroleum Law and Regulations is to regulate upstream activities and explore Turkey's remaining oil and gas potential effectively. General Directorate of Mining and Petroleum Affairs is the Competent Authority in Turkey which regulate all oil and gas exploration and production activities and dedicate licences. As per decree-law (662), one of major duty of General Directorate of Mining and Petroleum Affairs is to establish an investment environment for foreign investors. Also there are some other defined works in the decree-law (662) for General Directorate of Mining and Petroleum Affairs (MAPEG, 2011) related with IOCs:

1. To ensure that domestic and foreign investors make their oil exploration and production investments in a competitive, transparent, safe and stable environment within a program,
2. To open the fields that are determined as potential in terms of oil to auction and to give exploration license,
3. To examine the applications of companies for Concessionaire.

Licence period for offshore exploration fields was settled as eight years. If Concessionaire completed work program and guaranteed one exploration well and %2 performance bond, licence period might be extended as 3 years more. If Concessionaire completed work program in extension period and guaranteed drilling of another well and new work program, it might be extended another 3 years more. The limit of extension period is 9 and 14years for onshore and offshore licences respectively. If a discovery was occurred, two more years extension might be added to exploration period for well tests and commercial evaluations. Royalty ratio is %12.5 of produced oil. In the petroleum law, maximum tax ratio is limited with %55 as (MAPEG, 2013) "Obliged to pay petroleum right holders on their net income, the total withholding taxes and income taxes on behalf of their shareholders cannot exceed 55 percent.". %45 of produced oil and gas can be exported by Concessionaire, but rest of oil&gas has to be sold in local market. After exploration period, production licence is issued for 20 years and it can extended two times not more than 10 years by considering production program.

However draft Petroleum Law in 2011 was prepared by including some major changes in the royalty system (Aydin, 2011). The first one was that a royalty regime in accordance with production rates, API gravity, water depth and implementation of secondary enhanced oil recovery. The second one is that %50 of royalty shall be tranferred to the account of province. Also %5, %10, %20 and %30 less royalty would be collected for 0-500m, 501-1000m, 1001-1500m and more than 1500m water depths respectively. Morover 50% less royalty would be applicable for 16 API or less gravity oil ans %25 less royalty for enhanced recovery methods.

Unfortunately above desirable terms and conditions were not enacted with new Petroleum Law.

4.1 Oil and Gas Consumption/Production in Turkey

Turkish Petroleum Corporation (TPAO/TP) is the State Oil Company who manages most of exploration and production activities in onshore and offshore areas. Also there are some other private local and international petroleum companies which continue to produce gas and oil and sell their products in local market generally.

As of January 1, 2016, Turkey's proven oil reserves were estimated by the Oil & Gas Journal (OGJ) at 312 million barrels, located mostly in the country's southeast region (Energy Information Administration, 2017). In recent years the production has been increased to more than 50,000 b/d, 150,000 b/d with international projects.

Turkey's overall intake of liquid fuels averaged about 680,000 b/d in 2019. More than 90% of the overall supply of liquid fuels comes from imports. Much of Turkey's crude oil was imported from Iraq and Iran, which together accounted for slightly more than 60% of the country's crude oil.

Most of Turkey's proved oil reserves are in the Batman and Adiyaman Provinces in the southeast and in Thrace in the northwest. In 2015, Turkey produced an estimated 62,000 b/d of petroleum and other liquids, accounting for about 7% of Turkey's oil consumption.

Turkish natural gas reserves are projected to be 177 billion cubic feet as of January 1, 2016 (Bcf). Turkey only produces a small quantity of natural gas and total production in 2018 amounted to 15.4 Bcf (Statista, 2019):

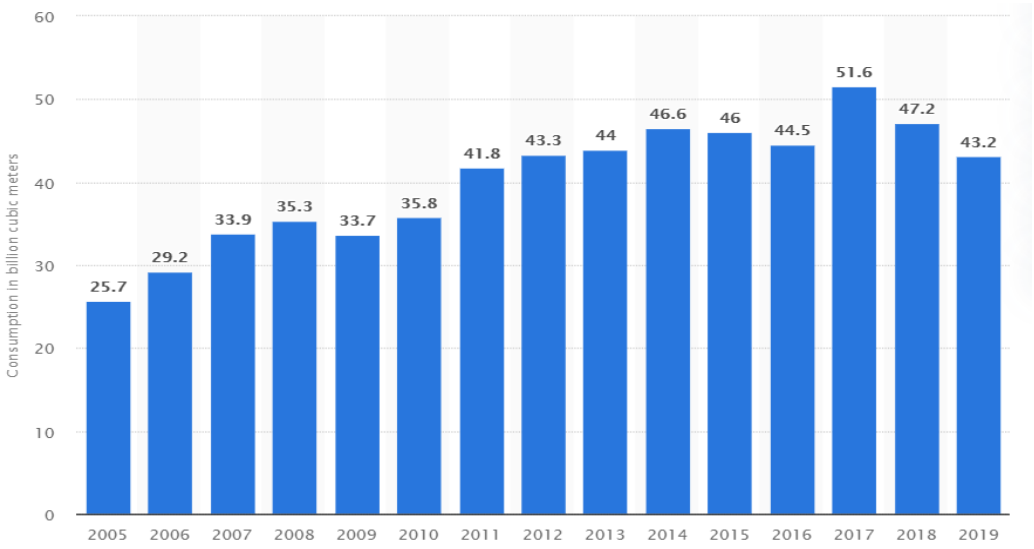


Figure 4-1_Turkey Natural Gas Consumption in 2019

Turkey is a major natural gas user and is becoming an effective transit state for natural gas. Turkey is one of the few countries in Europe where the consumption of natural gas continues to show strong growth. Increasing demand in Turkey has helped build several pipelines to carry natural gas into the country, and although little natural gas has been made available for export, new supplies have been contracted and new pipelines are under development to increase Turkey's natural gas imports and exports (Petform, 2019):

Turkey's Gas Import Agreements

Agreement	Signiture Date	Operation Date	Year	Volume (Plato – billion cubic meters / year)	End Date
Nigeria (LNG)	1995	1999	22	1,2	2021
Iranian	1996	2001	25	10	2026
Algeria (LNG)	1988	1994	27	4	2021
Russia (Blue Stream)	1997	2003	25	16	2028
Russia (Balkan Route)	1998	1998	23	8	2021
Russia (Balkan Route)	1998	1998	23	4	2021
Russia (Balkan Rotası)	2013	2013	23	1	2036
Russia (Balkan Route)	2013	2013	30	5	2043
Turkmenistan	1999	------	30	16	---
Azerbaijan	2001	2007	15	6,6	2022

Figure 4-2_Turkey Gas Import Agreements

In Turkey, natural gas use in 2014 and 2015 hit a new peak of 1.7 trillion cubic feet (Tcf). Natural gas is primarily used in power generation, which in 2014 accounted for almost half of the overall consumption of natural gas. In 2015, Turkey imported 1.7 Tcf of natural gas, accounting for 99% of total natural gas supply. Through LNG and multiple pipeline connections, Turkey has a reasonably diversified supply mix. Russia's Gazprom is by far the largest single supplier, accounting for 56% of Turkey's total natural gas supply in 2015. After Germany, Turkey is Russia's second-largest natural gas export market. BOTAŞ exported only 22 Bcf of natural gas in 2015 (Energy Information Administration, 2017):

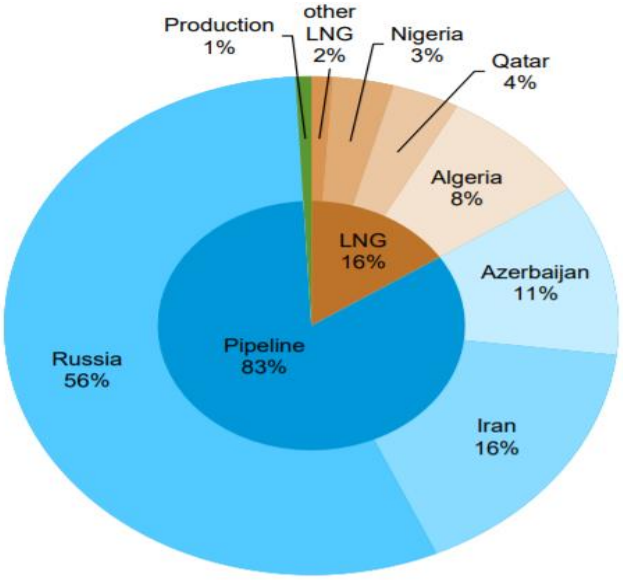


Figure 4-3_Turkey’s Natural Gas Supply by Source, 2015

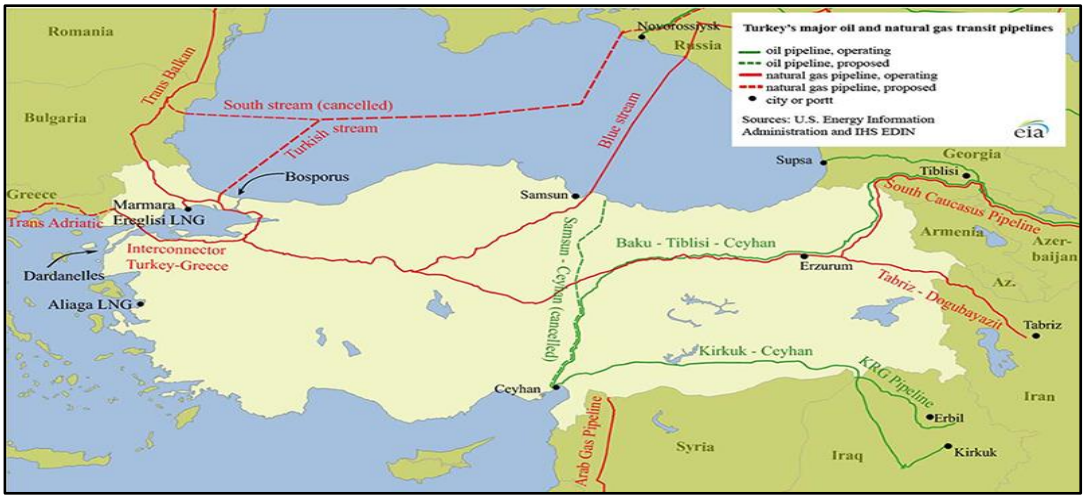


Figure 4-4_Turkey's Oil and Natural Gas Transit Pipelines (Energy Information Administration, 2017)

Offshore and shale reserves may become a future source of Turkey's oil&gas supply. Significant resources may lie under the Aegean Sea, although these resources have not been confirmed because of ongoing territorial disputes with Greece. The Black Sea may also hold significant oil production potential for Turkey. For instance, TPAO has already announced a new discovery as 405 billion m3 (14,175 trillion cubic feet "Tcf") in Sakarya Block which is the second biggest discovery in 2020 and continue to explore new licences in Black and Mediterranean Sea.

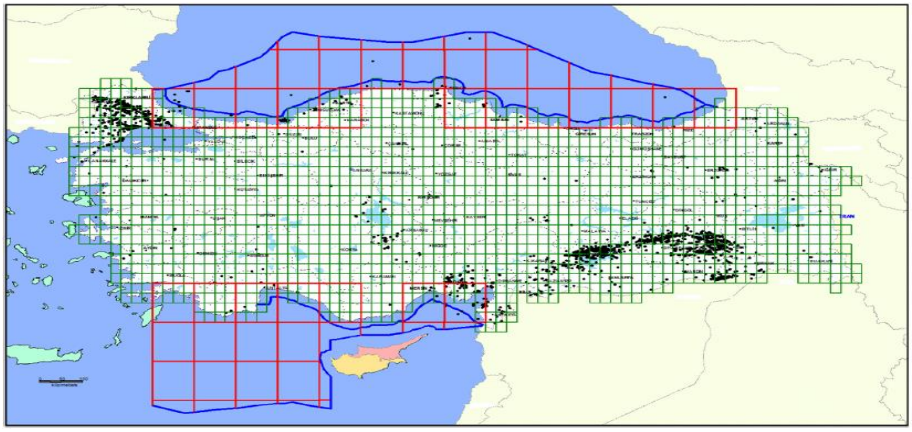


Figure 4-5_Petroleum License Application Map for Turkey (Özgür, 2015)

CHAPTER 5

CONCLUSION

Turkey had not existing petroleum and gas resources in the offshore till last quarter of 2020. First biggest discovery was announced as 405 billion m3 in Blacksea, Sakarya Block, October, 2020. Turkey needs to create the proper constitutional framework for exploration fields in Black Sea and Mediterranean in the Turkey and North Cyprus Economical Zone which overlap with Greece and South Cyprus zones.

Table 5-1_Comparison of Fiscal Terms with Turkey's Neighbours

Countries/Fiscal Terms	**Lebanon**	**Cyprus**	**Israel**	**Romania**	**Turkey**
Type	PSA	PSA	Concessionary	Concessionary	Concessionary
Royalty	%4 gas, %5-12 sliding scale with production	None	12,50%	Oil: 3,5% - %13,5 of gross production 3% derived from underground storage gas 10% of revenue for transportation	12,50%
Signature Bonus	None	Applied for initial tenders	None	None	None
Production Bonus	None	Applied for initial tenders	None	None	None
State Participation	Applicable but not in 1st round	None	None	None	None

Table 5-2_Comparison of Fiscal Terms with Turkey's Neighbours (Table 5-1 Continued)

Countries/Fiscal Terms	Lebanon	Cyprus	Israel	Romania	Turkey
Windfall Tax	None	Branch tax rate %12,5	%20-50 R factor based	• Natural gas: 60% fee on supplementary revenues obtained from the deregulation of prices in the natural gas sector • Oil: 0.5% of revenues for companies exploiting natural resources, with the exception of natural gas	Max. Limit %55
Cost Recovery Ceiling	Biddable	Biddable	None	None	None
Profit Sharing	Biddable	Biddable 1st round based on production 2nd round based on R factor	None	None	None
CIT	15%	12,5%+Capital Gain Tax as %20	26,50%	16%	22%
Training Fee	Up to 300,000 USD/year until beginning of production, 500,000 USD/year (%5 increment per year)	Biddable	None	None	None
VAT	None	%19 (for exploration %0)	None	20%	Applicable
Withholding Tax	None	None	None	16%	None
Government Take	%65-85	%64	%52-62	More than %65	% 55 (maximum)

It should be re-considered some special terms for offshore licences after the discovery in Black Sea other than licence period if more IOCs are expected to show their interest despite current oil prices. All petroleum contracts should be re-evaluated and considered some attractive terms for IOCs in case of continuation of

current low oil price trend especially for deepwater operations. Therefore Turkish Petroleum Law and Regulations might be recovered by authorities to settle more attractive fiscal regime in the region. By the way the well-known IOCs may show more interest to Turkey than any other region in the world and other countries in east Mediterranean and Black Sea. If IOCs show interest and accept to make investment for deepwater projects in Turkey, it would be very easy solution to decrease operational costs and sharing of risks for exploration operations.

After attracting IOCs and receiving their interest and Turkey decide to announce tender for potential licence fields, there must be in a climate transparency meet the highest standard of international practice. In the petroleum law, regulations and contract terms should be in compatible each other. Duration, extension and relinquishment rules should be simpler, clear and understandable for any parties. Licence fields should be awarded in order, not all in one.

The fiscal regime terms might be regulated by decreasing maximum tax ratio as %52 which will be equal tax in Israel. Also it can be decreased more or arranged as per R factor based. For gas reservoirs, %12,5 royalty rate can be decreased by considering higher expenditures of gas projects than oil. By decreasing tax ratio, a training fee might be applicable to support nationalization activities and train drilling and marine crew for deepwater offshore operations. Although the fiscal terms would re-evaluated and made more attractive for IOCs, %45 of exportation rate can be decreased by considering oil and natural gas requirements in domestic market in Turkey. Fiscal regime could be separated for onshore and offshore projects, also some separation could be applicable for the projects in Black Sea and Mediterranean.

As per the sample project summarized in the below table, it describes a deepwater project as 23 years project life and 20 years production life. The project is covering 1 exploration, 1 appraisal and 40 development wells. Exploration and appraisal wells will not be completed as producer wells. Deepwater exploration well cost is 60 MM USD and Appraisal Well is 40 MM USD, so 100 MM USD is assumed in 2020. Then development wells will be drilled in future years till 2030. First commercial

production will be in 1st quarter of 2023 and plateau production will be in 1st quarter of 2030. Total expenditure for wells is estimated 1.8 Billion USD in 10 years. For surface facilities, pipelines, LLIs and constructions, it is estimated as 19 Billion USD. Total expenditure is estimated as 22 Billion USD and 21 Billion USD will be spent in first 10 years which is a large investment amount.

Table 5-3_Sample Project Economics

Project Economics			Effective Date			1st Commercial Production						
Deepwater Gas Development Project in Turkey	Unit	Total	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Number of Wells	qty		2	3	3	4	5	5	5	5	5	5
Cumulative Number Wells	qty	40	2	5	8	12	17	22	27	32	37	42
Production (MM)	scfd	12,063	0	0	0	110	183	274	365	456	548	639
Production (MM)	m3	342	0	0	0	0	0	0	0	0	0	0
Net Total Production	boe	2,011	0	0	0	18	30	46	61	76	91	106
Revenue (MM) "50 USD/bbl"	USD	100,527	0	0	0	913	1,521	2,281	3,042	3,802	4,563	5,323
Revenue Cumulative (MM) "50 USD/bbl"			0	0	0	913	2,433	4,715	7,756	11,558	16,121	21,444
CAPEX												
Engineering (MM)	USD	1		0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
Surface Facility (MM)	USD	18,000		2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
Drilling (MM)	USD	1,000	100	100	100	100	100	100	100	100	100	100
OPEX (MM)	USD	820				20	20	20	20	20	20	50
Total Expenditure (MM)	USD	19,821	100	2,100	2,100	2,120	2,120	2,120	2,120	2,120	2,120	2,150
Total Cumulative Expenditure (MM)	USD		100	2,200	4,300	6,420	8,540	10,661	12,781	14,901	17,021	19,171
R factor			0.0	0.0	0.0	0.1	0.3	0.4	0.6	0.8	0.9	1.1

Table 5-4_Sample Project Economics (Table 5-3 Continued)

Project Economics		Plateau Production												End of Project
Deepwater Gas Development Project in Turkey	Unit	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Number of Wells	qty	0	0	0	0	0	0	0	0	0	0	0	0	0
Cumulative Number Wells	qty	42	42	42	42	42	42	42	42	42	42	42	42	42
Production (MM)	scfd	730	730	730	730	730	730	730	730	730	730	730	730	730
Production (MM)	m3	0	0	0	0	0	0	0	0	0	0	0	0	0
Net Total Production	boe	122	122	122	122	122	122	122	122	122	122	122	122	122
Revenue (MM) "50 USD/bbl"	USD	6,083	6,083	6,083	6,083	6,083	6,083	6,083	6,083	6,083	6,083	6,083	6,083	6,083
Revenue Cumulative (MM) "50 USD/bbl"		27,527	33,610	39,694	45,777	51,860	57,944	64,027	70,110	76,194	82,277	88,360	94,444	100,527
CAPEX														
Engineering (MM)	USD													
Surface Facility (MM)	USD													
Drilling (MM)	USD													
OPEX (MM)	USD	50	50	50	50	50	50	50	50	50	50	50	50	50
Total Expenditure (MM)	USD	50	50	50	50	50	50	50	50	50	50	50	50	50
Total Cumulative Expenditure (MM)	USD	19,221	19,271	19,321	19,371	19,421	19,471	19,521	19,571	19,621	19,671	19,721	19,771	19,821
R factor		1.4	1.7	2.1	2.4	2.7	3.0	3.3	3.6	3.9	4.2	4.5	4.8	5.1

As per Petroleum Law, %12,5 constant royalty is applicable for produced oil. However most of the countries quit to apply constant royalty and started to use sliding scale royalties. In case of using sliding scale royalty, R factor will be a key factor to determine royalty percentage:

Table 5-5_Sample Project Total Income and Expenditure-Fixed Royalty Rate

Items	Sample Project Costs and Revenue
Royalty (%12,5)	$ 12.565.885.416,67
Tax (max %55)	$ 55.289.895.833,33
Total Expenditure	$ 21.520.250.000,00
Total Cost	$ 89.376.031.250,00
Total Income	$ 100.527.083.333,33
Net Revenue during 23 years project life	$ 11.151.052.083,33

According to draft petroleum law in 2011 (Aydin, 2012), it was planned to add some major changes such as a royalty regime in accordance with production rates, API gravity, water depths and implementation of enhanced secondary oil recovery.

Table 5-6_Draft Petroleum Law in 2012 Sliding Scale Royalty Rate as per daily production

Offshore			
Crude Petroleum Production - Offshore (Bbl/Day)	Royalty Rate	Natural Gas Production on an operation field basis (MMm3/day)	Royalty Rate
Up to 20000	2%	Up to 3.3	3%
For 20001-50000	6%	For 3.3-8.2	6%
For 50001-100000	8%	For 8.2-16.4	8%
For 100001-150000	10%	For 16.4-24.6	10%
Above 150000	12%	Above 24.6	12%
Onshore			
Up to 500	2%	Up to 0.085	3%
For 501-2000	4%	For 0.085-0.34	6%
For 2001-5000	6%	For 0.34-0.75	8%
For 5001-10000	8%	For 0.75-1.5	10%
Above 10000	12%	Above 1.5	12%

In the draft version, some reduction would also be applicable as per water depths for offshore operations.

Table 5-7_Less Royalty Application for Offshore Projects

Reduced Royalty Rates for Oil Production (>1500m)	Reduced Royalty Rates for Natural Gas Production (>1500m)	Lower royalty application for Deepwater	Less Royalty Application
1.4%	2.1%	0-500m	5%
4.2%	4.2%	501-1000	10%
5.6%	5.6%	1001-1500m	20%
7.0%	7.0%	More than 1500m	30%
8.4%	8.4%		

By considering above planned changes for draft petroleum law, which was not enacted this way in 2013, sample project could be re-run and results could be compared:

Table 5-8_Total Royalty as per sliding scale

Up to 3.3 MMm3 (2023)	For 3.3-8.2 MMm3 (2024-25)	For 8.2-16.4 MMm3 (2026-28)	For 16.4-24.6 MMm3 (2028-2042)	Total Royalty
$ -	$ 159.69	$ 638.75	$ 5,908.44	$ 6,706.88

As seen above table, total royalty income decreased around 50%, however the aim would be decreasing expenditures till plateau production phase, this scenario achieves this, however total income would be same or more for HC. If royalty ratio is increased for higher production phases:

Table 5-9_Higher Royalty Rates for Higher Production

Natural Gas Production on an operation field basis (MMm3/day)	Royalty Rate	Reduced Royalty Rates for Natural Gas Production (>1500m)
Up to 3.3	**3%**	**2.1%**
For 3.3-8.2	**6%**	**4.2%**
For 8.2-16.4	**12%**	**8.4%**
For 16.4-24.6	**18%**	**12.6%**
Above 24.6	**20%**	**14.0%**

In this scenario, same amount of royalty will be gained by HC without increment of expenditures during initial phase of project:

Table 5-10_Total Royalty Income as per new royalty rates

Up to 3.3 MMm3 (2023)	For 3.3-8.2 MMm3 (2024-25)	For 8.2-16.4 MMm3 (2026-28)	For 16.4-24.6 MMm3 (2028-2042)	Total Royalty
$ -	$ 159.69	$ 958.13	$ 10,635.19	$ 11,753.00

By the way, IOC will not pay high royalty rates for initial production phases, however HC will receive almost same income "especially in the later phases of the project".

According to draft version of petroleum law in 2011 (Aydin, 2012), the Turkish Government aimed to increase oil investment activities and oil/gas production without any knowledge about a discovery that may come from deepwater operations in the following years. However the draft version was not enacted with this incentive options, fixed royalty rate (12.5%) is still applicable and there is no incentives for deepwater operations in the law.

The thesis focused on possible attractive and desirable fiscal regimes for deepwater operations in Turkey. The deepwater offshore activities are increasing with Fatih, Yavuz and Kanuni Drillships. After drilling eight deepwater wells in Mediterranean in last three years, Tuna-1, Türkali-1 and Türkali-2 deepwater wells were drilled in the Black Sea. Sakarya Gas Block was also discovered with Tuna-1 well. During last 60 years, more than 1 billion oil and five hundred billion cubic feet of gas was produced (Özgür, 2015). Most of production was made from south east part of Turkey. Petroleum Law was updated several times between 1954-2013 as per requirement of petroleum sector. Although two production peaks (1969 and 1990) were observed in this period, production trends decreased year by year till last two years. On the other hand a new production peak may occur due to deepwater

activities. Also, drilling activities has reached the highest level in the European Countries.

As a summary, petroleum law and regulations of Turkey for offshore licences should be re-evaluated by considering current oil and gas market situation in the world and abroad, increasing offshore activities in East Mediterranean, the gas discovery of Turkey in the Black Sea. After a discovery, most of the countries prefer to use Production Sharing Agreement if they are not rich oil countries. If a concession is preferred for offshore, sliding scale royalty system could be selected for offshore activities. In the sliding scale, government can determine each ratio for different production level or it could biddable for IOCs. Therefore all tenders, petroleum laws and regulations should be reviewed and examined by Turkish Authorities/Law Makers attentively to increase total profit of Turkey in the long run, decrease project expenditures during exploration phase and create more attractive biddable atmosphere for IOCs.

REFERENCES

Journal of Petroleum Technology, Global Deepwater Production Hits 10 Million BOE/D, 2019. https://jpt.spe.org/global-deepwater-production-hits-10-million-boed-milestone

Dr. Richard D. Seba, International Petroleum Contracts and Negotiations, Petroskills, 2006.

Mark Kolakowski, History of Oil Prices, 2020. https://www.investopedia.com/history-of-oil-prices-4842834

Ernest E. Smith, John S. Dzienkowski, Owen L.Anderson, JohnS. Lowe, Bruce M.Kramer, Jacqueline L. Weaver , International Petroleum Transactions, 3rd Edition, 2010.

Daniel Johnston, International Petroleum Fiscal Systems and Production Sharing Contracts, 1994.

L. Aydin (2012). The Economic Impact of Petroleum Royalty Reform on Turkey's Upstream Oil and Gas Industry. Energy Policy 43, 166-172.

E. Özgür (2015). Upstream Petroleum Law and Activities in Turkey. Energy Policy 88, 131-137.

Newsweek, Brazil faces the Oil Curse, 2015. http://www.newsweek.com/brazil-faces-oil-curse-81061.

J. Jay Park QC, World Legal Systems & Contracts for Oil & Gas, CWC School for Energy, 16-20 June 2014.

Muhammed Mazeel, Petroleum Fiscal Systems and Contracts, Hamburg, 2010.

International Energy Agency, Offshore Energy Outlook, 2019.

https://www.rystadenergy.com/newsevents/news/press-releases/ep-companies-paid-over-1.9-trillion-usd-in-the-form-of-government-compensation-in-2013

Tim Boykett & Marta Peirano & Simone Boria & Heather Kelley & Elisabeth Schimana & Andreas Dekrout & Rachel Oreilly, Oil Contracts - How To Read and Understand Them, P.17-21, 2012.

https://www.un.org/Depts/los/convention_agreements/texts/unclos/UNCLOS-TOC.htm.

http://en.citizendium.org/wiki/Upstream,_midstream_and_downstream_%28petroleum_industry%29

Dr. Ingilab Ahmadov, Contracts and revenue sharing mechanisms – an international perspective, Accra, 5-6 February 2009.

https://data.worldbank.org/indicator/GC.TAX.TOTL.GD.ZS

Nakhle, C., Petroleum Taxation: Sharing the Oil Wealth: A Study of Petroleum Taxation Yesterday, Today and Tomorrow, Routlege, 2008.

Kirsten Bindemann, Production-Sharing Agreements: An Economic Analysis, Oxford Institute for Energy Studies, October 1999.

National Agency Of Petroleum, Natural Gas, And Biofuels – ANP, Open Acreage Tender Protocol, Rio De Janeiro, April 26, 2018.

https://pdfs.semanticscholar.org/ab9e/78cb07b8dae96765903ba9a264f7b2b00e39.pdf

https://www.lpa.gov.lb/404.html?aspxerrorpath=/pdf/Prequalification%20Application

BP Statistical Review of World Energy, 2014. http://large.stanford.edu/courses/2014/ph240/milic1/docs/bpreview.pdf

https://pdfs.semanticscholar.org/ab9e/78cb07b8dae96765903ba9a264f7b2b00e39.pdf

https://www.energysea.gov.il/EnglishSite/PublishingImages/Pages/Forms/EditForm/Israeli%20Gas%20Opportunities.pdf

M. Ratner, Natural Gas Discoveries in the Eastern Mediterranean, 2016. https://fas.org/sgp/crs/mideast/R44591.pdf

https://pdfs.semanticscholar.org/ab9e/78cb07b8dae96765903ba9a264f7b2b00e39.pdf

http://www.econet-romania.com/files/document-2014-12-5-18755546-0-strategia-energetica-analiza-stadiuluiactual.pdf

Auty,M.Richard,1993, Sustaining Development in Mineral Economies:The Resources curse Thesis,Routledge,LondonandNewYork,1993.

Offshore Energy, OMV strikes oil in Blacksea, 2014. http://www.offshoreenergytoday.com/omv-strikes-oil-in-black-sea-romania/

http://www.offshore-mag.com/articles/2015/10/lukoil-discovers-potential-giant-gas-field-offshoreromania.html.

http://www.mapeg.gov.tr/PetrokKanunYonetmelik/662SayiliKanunH%C3%BCkm%C3%BCndeKararname.pdf

http://www.mapeg.gov.tr/PetrokKanunYonetmelik/6491_SayiliTurkPetrolKanunu.pdf

Energy Information Administration, Turkey, 2017. https://www.eia.gov/international/analysis/country/TUR

Global Oil and Gas Tax Guide, 2019

https://www.ey.com/en_gl/tax-guides/global-oil-and-gas-tax-guide-2019

Akın Law Office, Turkey's New Petroleum Law: General Framework And Incentives, 2014.

https://www.statista.com/statistics/703684/natural-gas-consumption-turkey/

https://www.petform.org.tr/en/dogal-gaz-piyasasi/turkiye-dogal-gaz-piyasasi/

APPENDICES

A. Chronology of Oil & Gas Sector

Year	Milestones	Year	Milestones
1821	Russia established mineral leasing system	1950	50/50 deal between Aramco and Saudi Arabia
1858	First oil well – Ontario, Canada; Trinidad – LaBrea asphalt refinery	1951	Iran nationalized Anglo Iranian Oil Company
1859	Drake drilled first well	1954	Iranian Consortium established – Turkish Petroleum Corp. established in Turkey. Service Contract 1st MODU was constructed by Mr. Charlie Suez Crises
1869	Oil discovered in Peru	1956	Oil discovered in Algeria and Nigeria
1870	John D. Rockefeller formed standard oil	1957	Enrico Mattei (ENI) 75/25 profit split with NIOC (Iran) Amoco/Iran – 50/50 joint venture
1872	Russia adopts auction system selling mineral interests to individuals	1958	First LNG shipment – Louisiana to England
1873	Baku oil opened – Nobel family	1959	Oil discovery in Libya – Birth of spot market
1877	Nobel brothers build first oil pipeline and first Russian tanker	1960	OPEC founded in Baghdad
1885	Rothschilds enter Russian oil business	1966	First Production Sharing Agreement (PSA) – Mobil in Indonesia 1st offshore well in Turkey (Seyhan-1, TD: 4804m, WD: 40m)
1890	Royal Dutch chartered to produce oil in East Indies	1967	6-day War – Israel/Egypt
1892	Marcus Samuel shipped oil through Suez – Shell	1969	Oil discovery in North Sea
1896	Henry Ford built first Ford car Russia reverts to auction royalty system	1970	Libya squeezes oil companies

1901	William Knox Darcy obtained concession in Persia Lucas Gusher – Beaumont , Texas (rotary drilling)
1903	Wright brothers first flight
1907	Shell and Royal Dutch combined
1908	Persia oil discovery – Anglo Persian
1909	Henry Ford introduced model T
1910	"Golden lane" discovered in Mexico
1911	Standard Oil Trust dissolved by US – Antitrust
1912	Shell purchased Rothschild's Russian interests
1914	British government acquires 51% of Anglo Persian "Foreign Office Agreement" (Red Line) – Middle East
1917	Russian Revolution – nationalized industry Oil discovered in Ecuador
1918	Oil discovered in Colombia
1927	Kirkuk (Iraq) field discovered – "Red Line" affirmed
1928	Achnacarry Castle "As-Is" Agreement
1932	Bahrain Oil Discovery – Bahrain Petroleum (Socal)
1938	Saudi Arabia Oil Discovery – CALTEX Mexico nationalized oil industry
1939	First oil production in Saudi Arabia
1972	US peak production
1973	Yom Kippur War – First Oil Price Shock – OPEC
1976	Venezuela nationalized oil industry Iranian revolution
1979	Second oil price shock Spot market (Rotterdam) emerges
1981	1st deepwater wells in Turkey (Ayşe-1, TD:1675m, WD:216m)
1982	OPEC's first quotas
1985	UK sells share (51 %) of BP
1986	Oil Prices collapsed
1989	Exxon valdez tanker spill Fall in Berlin Wall
1990	Iraq invaded Kuwait Iraq embargo
1995	Venezuela reopened to foreign investors
2008	Oil shortage after a series of events, $118/bbl in De 2007, the price of oil rose to above $165 by mid-2008
2009	Recession and Financial Crisis: By January 2009, oil prices decreased to low $50s per barrel before rebounding to almost $95 by the end of the year
2017	Fatih DS (Deepsea Metro II) was purchased by Turkish Petroleum
2018	Yavuz DS (Deepsea Metro I)was purchased by Turkish Petroleum
2020	Kanuni DS (Sertao) was purchased by Turkish Petroleum

1943	First 50/50 deal – Venezuela	2020	U.S. Shale Oil Revolution (Kolakowski, 2020): Partly because of this, crude oil prices declined from about $87 per barrel in early 2010 to just under $51 by January 2020