הערת הבהרה לנספח׳ חוות דעת מאת דניאל ג׳ונסטון:

נספח זה הוגש לוועדה עת גיבשה את טיוטת עיקרי המלצותיה, כפי שפורסמו ביום 15 בנובמבר 2010, לתגובת הציבור. אי התאמות בפרמטרים של המערכת המוצעת בין נספח זה לבין דו״ח הוועדה נובעות מהשינויים שהוועדה ביצעה לאחר פרסום טיוטת עיקרי המלצותיה. יש לציין עם זאת כי רלוונטיות חוות הדעת עומדת בעינה.

ISRAEL

Hydrocarbon Fiscal Analysis

and

Commentary

15 November, 2010

Daniel Johnston

Daniel Johnston & Co., Inc.

www.danieljohnston.com
daniel@danieljohnston.com

60 Shady Lane
Hancock, New Hampshire

Table of Contents

Appendices

Introduction

Daniel Johnston & Co., Inc. was asked to analyze current and proposed license terms in Israel, with respect to (a) fiscal viability of the terms, (b) sustainability, (c) flexibility and fairness, (d) alignment of interests and (e) competitiveness and placement in the global market for exploration acreage and projects.

The work provides a discussion of how the current and proposed terms compare worldwide relative to Israel's political, geological, and geographical patrimony.

Careful consideration is given to Israel's objectives and concerns regarding its hydrocarbon industry and future.

Also, discussion is provided regarding the situation and boundary conditions that exist in Israel as well as the concerns and objectives of the Israeli Government.

We also provide comparative summaries of peer countries/regions and discussion of key elements of consideration.

Abbreviations and acronyms are summarized in Appendix 1.

Daniel Johnston – Chairman and Founder
Daniel Johnston & Co., Inc.

Conclusions

(1) Israel's geopolitical, geographical, geological situation has advantages and disadvantages for oil industry investors.

(a) Boundary conditions in Israel are relatively harsh:

i) Risky: politically 'landlocked' – confronting dangerous threats
ii) High-cost deepwater province,
iii) Gas prone

(b) Advantages in Israel are relatively robust:

i) Recent discoveries have opened up the province
ii) Discoveries/prospects are close to infrastructure and market(s)
iii) Business/commercial environment is healthy and efficient

(2) Israel is unique in many ways (as are most countries) but there are means of evaluating its global position.

(a) By world standards Israel's fiscal terms are virtually obsolete.
(b) By world and peer-group standards Israel's petroleum fiscal terms are extremely lenient.

i) Israel's share of profits ('take') is one of the very lowest in the world.
ii) The means by which the government obtains its share of profits is also lenient.
iii) The current terms are extremely regressive.[1]

(3) The "Proposed Terms" in Israel represent state-of-the-art in fiscal design.

(a) Government take would be competitive—slightly less than world average.
(b) The system would be one of the more progressive systems in the world.
(c) Companies would still have considerable upside potential above and beyond their corporate investment threshold criteria.
(d) The interests of the IOCs and the State are well aligned.
(e) The system encourages cost savings.

[1] As overall profitability goes up the government share of profits goes down.

Discussion

Following the recent Tamar gas field discovery in Israel's deepwater frontier, the Minister of Finance appointed a committee[2] to review Israel's petroleum fiscal system. The committee requested that we address the following:

- Review all segments of the fiscal systems (current and proposed)
- Examine the systems in terms of fairness and flexibility
- Explore alternate petroleum fiscal designs
- If appropriate, propose new designs or elements for the proposed system

The overarching objective is to establish a fiscal framework for Israel that provides a fair share of the economic rent, is competitive from an international perspective, and provides a framework for further investment.

Background and History

Israel's current terms are derived from petroleum law that came into effect in 1952. The system in 1952 was very similar to what existed in the United States at the time. But since then the US and much of the rest of the world has changed significantly.

Claude Mandil, Former Executive Director of the International Energy Agency (IEA) in his Preface to the Second Edition of **"International Petroleum Exploration and Exploitation Agreements" C. Duval, H. Le Leuch, A. Pertuzio et al, Barrows, 2009** stated:

> "Only twenty-two years have elapsed since this treatise was first published in 1986, and, yet, it seems that we are living in a different world."

It is true that during the elapsed time Dr. Mandil was talking about the industry underwent considerable change. But the same was true of the 3 decades prior to 1986.

In the early 1950s the international petroleum industry (what there was of it) focused almost exclusively on oil (not gas). Furthermore, at that time the offshore oil industry had not even begun let alone the deepwater industry. Even as late as the mid 1980s the deepwater industry as we now know it did not yet exist.[3]

Prior to 1948 most systems consisted of a simple royalty. In 1948 after World War II Venezuela initiated the first 50/50% split on profits between a government and the IOCs

[2] Referred to as the Sheshinski Committee after the Committee Chairman Professor Eytan Sheshinski..

[3] Johnston, D., "Field Development Options for Deep Water", **Oil & Gas Journal**, May 5, 1986, pp. 132-142.

(i.e. a government take of 50%). In 1950 Saudi Arabia followed suit. Furthermore prior to this the US government received more in tax revenue from American companies operating in Saudi Arabia than the Saudi government received. The same was true in Iran where the British government received more in tax revenues from British companies operating in Iran than the Iranian government. In today's world this would be unthinkable. Since then the government share of profits (take) has reached over 90% in some systems/contracts. Libya is one example and the terms there were essentially determined by industry through competitive bidding.

The division of profits (take) is fundamental to any business relationship and is often used to compare countries, systems or contracts.

> "One of the key parameters in determining the attractiveness of a country for exploration is the level of Government Take – the lower the take, the more attractive the opportunity. A low tax rate, however, can be associated with a high risk that this will be changed in the future if windfall profits are realized."
>
> "***The pitfalls of windfalls***", G. Kellas, Wood Mackenzie Ltd., 2006[4]

Average government take (undiscounted) for oil and gas exploration rights is reported by various sources at from 67% to 72%.[5] This is consistent with our experience.

During the six decades since the inception of Israel's petroleum laws there has been considerable change and evolution in industry fiscal structures on philosophical, legal and financial fronts. In 1964 in an effort to gain greater control over the oil industry Indonesia introduced a new approach—production sharing contracts (PSCs). With this came changes in the legal structure of the relationships between international oil companies (IOCs) and host governments. Since the PSC was introduced in the oil industry much of the contract language, financial formulas and legal perspective has undergone significant change.

The evolution of contract language, financial perspective, and legal attitude has been forged from various price shocks, renegotiations, legal disputes, and fiscal re-design. For example, the famous Indonesian contract is into its 4th or 5th generation (depending on how the count is conducted). Now, over half of the worlds' petroleum fiscal systems are based on a PSC (or equivalent).

The rest of the world still uses what are now called 'royalty/tax' systems, or license-based (concessionary) systems like that now used in Israel.

But with many systems, both PSCs and royalty/tax systems, changes are a common

[4] http://www.eandpnet.com/articles/1957?PHPSESSID=cad34b87cf7cbe727dd2f936ea13ebf8

[5] Although in some parts of the world where a difference exist gas terms have a lower government take than that for oil.

occurrence. Within the past 4 decades the UK has made nearly twenty (20) changes to the tax rates or terms for their system.

Many of the changes worldwide, particularly on the financial front, were either triggered or catalyzed by the price shocks of 1973/4 (the embargo), 1979 (revolution in Iran) and 2007-2008.

The industry has spent considerable effort attempting to design the most efficient and effective systems. The process has been enlightening. It takes time and experience to recognize and adjust for shortcomings inherent in any given petroleum fiscal regime or any particular fiscal device. Unforeseen events and unintended consequences test and even break some fiscal systems and/or agreements. A given regime's ability to accommodate unanticipated events or situations is one indication of its strength and viability. The petroleum industry has learned much in the last 50 years. The structures of and many common components in petroleum fiscal systems were not arrived at overnight. It takes a lot of time and experience for new approaches and/or formulas to evolve into something that can be trusted and used with comfort.

Recent Fiscal Changes

During the run-up to the 2007-8 price shock and in its wake there was considerable change taking place with fiscal terms worldwide. Some countries loosened up their terms and reduced government take while others increased their share of profits—significantly. In a number of instances the changes applied to existing fields, or licenses rights. The most prominent changes to existing license rights, in terms of wealth transfer, came in Russia, the UK, Venezuela, and Alaska. Other changes to existing rights were made in Algeria, Bolivia, Ecuador, China, Alberta, and Canada.

> "Some of the most pronounced increases in government take have not been in developing countries but in OECD areas such as the UK, Alberta and Alaska. Investors in these areas operate under concessions with no protection from ad hoc changes to prevailing royalty and tax terms."
>
> From: "Contract and Fiscal Stability: Rhetoric and Reality", Cameron, P., Kellas, G., Wood Mackenzie & CEPMLP, AIPN International conference, Ediinburgh, Scotland, September, 2008.

These changes are discussed below:

UK — The UK made two significant changes by increasing the tax rate for existing petroleum operations from 30% to 40% in 2002 and then another increase to 50% in 2005. The tax rate for the large old legacy fields like Ninian, Brae and Forties rose to 75%. However, in this analysis and for comparative purposes we have used the 50% government take for non-legacy fields. This is done in part as a matter of convention but it causes some confusion. For example in the numerous statistics quoted such as "world average

government take" it is rare that the 75% take in the UK is included. Also, future licenses in the UK are looking at 50% take. However, 10 years ago they were looking at 30% take and legacy fields were at 65% take. The negative financial impact to IOCs from these changes was one of the largest in the world.

Alaska — Three successive changes were made in each of the years 2005, 2006, and 2007. The first two changes occurred under then Governor Frank Murkowski. The final change in 2007 occurred under the Governorship of Sarah Palin. Referred to as "Alaska's Clear and Equitable Share (ACES) is a progressive profits-based tax.

One feature of the now-current ACES system in Alaska is that with this tax[6] for each $1.00/BBL increase in oil prices (above a specified threshold price of $40/BBL[7] in 2007) the severance tax rate goes up by one quarter of one percent. Thus with a price increase of $10.00/BBL the tax rate increases by 2.5%. This tax was once based on production but is now based on profits. Additionally the State now provides investment credits for exploration expenditures. Unlike what happened in Alberta, Alaska's changes appear to have been fairly successful but even the State of Alaska has not claimed victory just yet. Investment and employment is up from pre-2007 levels but there are too many factors to make an absolute determination at this time according to the State of Alaska.[8]

> "In 2006, before our reform law took effect, North Slope investment sat at $3.9 billion. By 2008, with ACES, it had risen to $4.9 billion."
>
> Alaska State Representatives Berta Gardner and Les Gara, 14 January, 2010

Canada (Alberta) — The Alberta story is a story of failure. The Alberta government made changes in 2007 by increasing government take. This had almost immediate backlash from industry. Investment activity in Alberta plummeted in part because companies simply moved their investments to neighboring provinces in Saskatchewan and British Colombia and also in part due to the huge boom in shale gas drilling throughout North America. Alberta had to back down and they did this in 2010.

Overview of World Petroleum Fiscal Statistics

The standard metrics for fiscal system analysis include, (a) government take, (b) effective royalty rate, (c) IOC internal rate of return, (d) IOC net present value, and (e) expected value (also know as 'risked value').

Government take statistics

[6] Which is separate and distinct from the State royalties, income taxes, and Federal income tax.
[7] A Topical Analysis of the ACES Bill, Mintz, R., K&L Gates, 21 October, 2007, http://www.revenue.state.ak.us/ACESDocuments/RobMintz/TopicalAnalysis10-21-07-Mintz.pdf
[8] From "**Alaska's Clear and Equitable Share (ACES) Status Report"**, Alaska Department of Revenue, January 14, 2010

The government take statistic is one of the most widely quoted and followed statistics in the industry. It is important because it quantifies the division of profits (take), which is one of the most fundamental aspects of any business arrangement. Unfortunately the terminology associated with the division of profits is not standardized in the industry. Some discussion on the subject of government take has already entered the debate in Israel. However, in the industry the term 'state take' is also common. The typical 'state take' statistics often quoted by some analysts would be the appropriate statistics for comparison purposes here with the government take statistic as it is defined below:

$$\textbf{Government Take (\%)} = \frac{\textbf{Total Government Revenues}}{\textbf{Gross Revenues – Total Costs}}$$

Where:

Total Gvt. Revenues = All revenues from royalties, taxes, production sharing, and government equity participation (full-cycle).

Gross Revenues = All revenues from the sale of hydrocarbons (full-cycle)

Total Costs = All capital costs and operating costs (full-cycle).

Government take is calculated on a discounted and undiscounted basis.

The division of profits is determined prior to contract signing like so many elements either through (1) competitive bidding, (2) negotiations, or (3) through statutes (by law i.e. "fixed terms"). In fact, it is usually the first thing agreed upon.

There are four main means by which governments get a piece of the pie or as it is also commonly called "rent":

The Four Main Rent Extraction Mechanisms Worldwide

	Percentage Contribution of Worldwide Rent
1) Signature Bonuses	**1 – 2%**
2) Royalties	**15 – 18%**
3) Profits-based elements (profit oil split and/or taxes)	**70 – 75%**
4) Government Participation	**6 – 7%**

It is worth pointing out that while royalties worldwide average around 7-8% they contribute from 15-18% of total government revenues from the hydrocarbon industry.[9] This is partly because they are typically based on gross production not profits. The general view is that unless a government is desperately in need of up-front cash it is better off in the long run obtaining the majority of its share of production or revenues (or rent) with back-end-loaded elements like production sharing, taxes or government participation. While the more regressive elements (bonuses and royalties) will ensure that some of the government's *take* comes sooner (rather than later) the government is likely to end up with less if the system is too heavily front-end-loaded (i.e. regressive).

Signature Bonuses

Nearly half of all countries with hydrocarbon fiscal systems use signature bonuses as part of their system. In the US, competitive signature bonus bidding is the means by which the Federal Government allocates licenses. Signature bonuses are fairly significant in the US compared to most other provinces but typically around the world bonuses contribute only a small part of the overall government take (or rent). This is true even of bonuses that can sound quite large outside of the context of the other aspects of a fiscal system and outside the context of the geological situation. For example, the prospectivity and chances of success are so great in some situations, bonuses take on financial characteristics of a relatively low-risk production acquisition.

In the following flow diagrams, graphs and analysis, bonuses are not included. This is typical in the industry and generally acceptable for a number of reasons. First of all bonuses are usually relatively immaterial compared to other means by which governments extract rent (the US is one general exception to this rule). Secondly, in order to truly

[9] Royalties with royalty/tax systems average around 10% and royalties in PSCs average around 5%.

quantify the impact of bonuses, both risk analysis and present value discounting is required and this can become very subjective and speculative.

There are many other kinds of bonuses such as those triggered by a discovery, or attainment of commercial status, production startup, commissioning of facilities or achievement of certain production thresholds such as accumulated production or specified production rates. These other bonuses are also usually relatively insignificant but unlike a signature bonus which constitutes part of the "risk capital" the other bonuses are part of the "reward side of the risk equation" (referred to often as the *expected value* formula). In other words these bonuses are not paid if there is no discovery. They are only paid in the event of a discovery, a determination of commerciality, commencement of production and so forth. These bonuses are often included in the take statistics but rarely have a material impact.

Government Participation

One unique rent-extraction element found outside of North America and most of the OECD countries is what is known as government participation ("government carry" or "government risk-free carry"). Nearly half of the governments worldwide use this option as part of their system—PSCs usually. Typical government participation is where a national oil company (NOC) or the equivalent has the right and/or option to take up a working interest in a discovery if the discovery is deemed to be *commercial* (i.e. it is 'carried' through the risky exploration stage of the agreement). It is not a popular thing with IOCs but it is a fact-of-life. In about half of these arrangements the NOC will reimburse its share of "past costs" at the point at which it "backs-in" and takes up a working interest. Past costs include all costs incurred from the *effective date* of the agreement to the *commerciality date*. Both of these terms (effective and commerciality dates) are usually defined in a contract. Typically from the moment the NOC "backs-in" (at the commerciality point) it "pays-its-way" or is said to be "heads up" or "straight-up" just like any other working interest holder in that it is subject to a joint operating agreement and meets cash calls like other participants.

The other two (of the four) main means by which governments get a piece of the pie include royalties and profits-based elements. These are the heart-and-soul of most arrangements between IOCs and host governments and constitute over 90% government rent extraction worldwide.

Royalties

Most governments have royalties similar to the 12.5% royalty in Israel. These fiscal elements are often a normal and formal part of either a license agreement or a PSC. The countries that do not have a direct royalty usually have at least an equivalent mechanism created by a cost recovery limit.[10] Royalties and cost recovery limits are about the only fiscal mechanisms that guarantee the government a share of production or revenues each and every accounting period.

[10] Cost recovery limits are unique to PSCs.

Many governments allow deductions for royalty determination to allow for the costs of transporting the hydrocarbons from the wellhead (the point of valuation for royalty purposes) to the point of sale. However, if the governments were to take their royalty 'in kind' at the wellhead the economic effect would be that of the statutory or contractual royalty. The government would then have to pay for initial processing and transportation to the point of sale. But from the investor point of view the financial effect would be that of the statutory or contractual royalty. It is for this reason that government take analysis (including this Report) use statutory royalties and rarely account for net-back provisions.

Considering the combination of royalties and cost recovery limits the average 'guaranteed' government share is around 20%.[11] Buy this measure Israel's royalty is considerably lower than world average. We refer to this 'guarantee' as the 'effective royalty rate' (ERR) and this is discussed in greater length below.

Profits-Based Mechanisms

Profits-based mechanisms which include mostly (1) taxes and (2) production sharing are the most common features found in license agreements or PSCs. Often there are multiple layers of profits-based rent extraction mechanisms such as: special profits taxes, windfall profits taxes, oil and gas production sharing, and/or corporate income taxes. The most common aspect of these rent extraction mechanisms is that they are based on gross revenues less various deductions for capital and operating costs. Therefore with many field developments the deductions in the early stages of production can be so high that the actual tax base in those accounting periods is zero. Thus it is common during the early stages of production from a field that no tax payments will be generated.

Also, most taxes including corporate income taxes are not a direct part of a petroleum license or even a PSC. The obligation to pay taxes is part of the agreements either directly or indirectly is often included-by-reference in the license or the agreement or the laws of the country.

Progressive Rent Extraction Elements

More and more governments have concluded that a progressive system capable of accommodating wide ranges of profitability is best. Few governments have confidence in what the future of oil and gas prices and costs may be. This is good reason to design a system that can handle the full range of possible outcomes. Sliding scales in our opinion are simply the best option. Furthermore there has been considerable experience and evolution with respect to sliding scales.

Approximately 70% of the systems worldwide have some form of sliding scale. They typically govern either royalties or profits-based rent extraction mechanisms such as

[11] Johnston, D., "Index useful for evaluating petroleum fiscal systems", **Oil & Gas Journal**, 1 December, 1997. pp. 49-51.

production sharing, special petroleum taxes and/or windfall profits taxes.[12] There are a variety of methods or sliding scales used:

Production-based sliding scales
Based upon average daily rates of production
Based upon accumulated production
Payout-based sliding scales "R factors" and Investment multiples
Internal-rate-of-return (ROR)-based sliding scales

These sliding scales are ostensibly designed to provide the host government a greater share of profits for more profitable and/or larger fields. But, most sliding scales are and have been based on either average daily production rates or accumulated production. Furthermore, the production-based scales essentially use production rates as a proxy for profitability. It is true that a larger field is likely to be more profitable due to economies-of-scale but this is not guaranteed. Also, the common production-based systems are simply not able to deal with fluctuations in oil prices. This weakness of production-based sliding scales became more obvious and painful with the price shock of 2007-2008.

Dividend and Withholding Taxes

Dividend and withholding taxes (also known as repatriation taxes) are rarely included in government take calculations. We have not included them in this analysis. These taxes are often not paid by international companies because of various loopholes, reductions or eliminations due to treaties and corporate structuring. Therefore most analysts ignore these taxes unless (like in Indonesia) it is certain these taxes are to be paid by the international oil companies.

Value Added Taxes

Value Added Taxes (VATs) are typically indirect taxes based on the consumption of goods and services. A VAT typically applies to every taxpayer conducting business or engaged in trade that sells assets or provides services during the course of business in any given country.

VATs are rarely included in government take calculations because for the petroleum industry these taxes are often either 'zero-rated' or are reimbursed and the ultimate effect is nil. Therefore, we have not included them in this analysis.

Effective Royalty Rate Statistics

While the government take statistic quantifies the important division of profits, the effective royalty rate (ERR) provides insight into *"how"* and *"when"* the government receipts would be received. It is also an excellent measure of how "front-end" loaded a system is (i.e. mostly a function of the non-profits-based rent extraction mechanisms). The

[12] These taxes go by a variety of names.

ERR statistic represents the minimum share of gross revenues or production a government will receive in any given accounting period for a given project. The ERR is an important index that adds dimension to the "take" statistics—it is an important "companion statistic".

With royalty/tax systems like Israel's system the royalty is the only guarantee the government will receive anything in any given accounting period.

With production sharing systems (the other half of the systems worldwide) in addition to royalties there is another mechanism that will guarantee the government a share of production or revenues each and every accounting period. This is the "cost recovery limit" which, for most practical purposes, behaves like a royalty. Considering the combination of royalties and cost recovery limits the average ERR of a production sharing contract (PSC) is around 30%. World average ERR is around 20%.[13] Buy this measure Israel's royalty is considerably lower than world average.

Figure 1 and similar graphs have been used in various publications and industry presentations for the past 15 years. There are also numerous ways in which consultants, or analysts compare various provinces or countries with respect to government take (or state take). This particular graph was used in the Oil & Gas Journal 18 April, 2005 to describe the then-recent license round in Libya.[14] The graph has been modified to show where Israel's current terms 'fit' within this sampling of systems worldwide. Israel's position is at the lowest end of the scale at around 27% government take with an effective royalty rate (ERR) of 12.5% and no government participation.

[13] Johnston, D., "Index useful for evaluating petroleum fiscal systems", **Oil & Gas Journal**, 1 December, 1997. pp. 49-51.

[14] Johnston, D., "Impressive Libya licensing round contained tough terms, no surprises" **Oil & Gas Journal, 18** April, 2005, pp. 29-37.

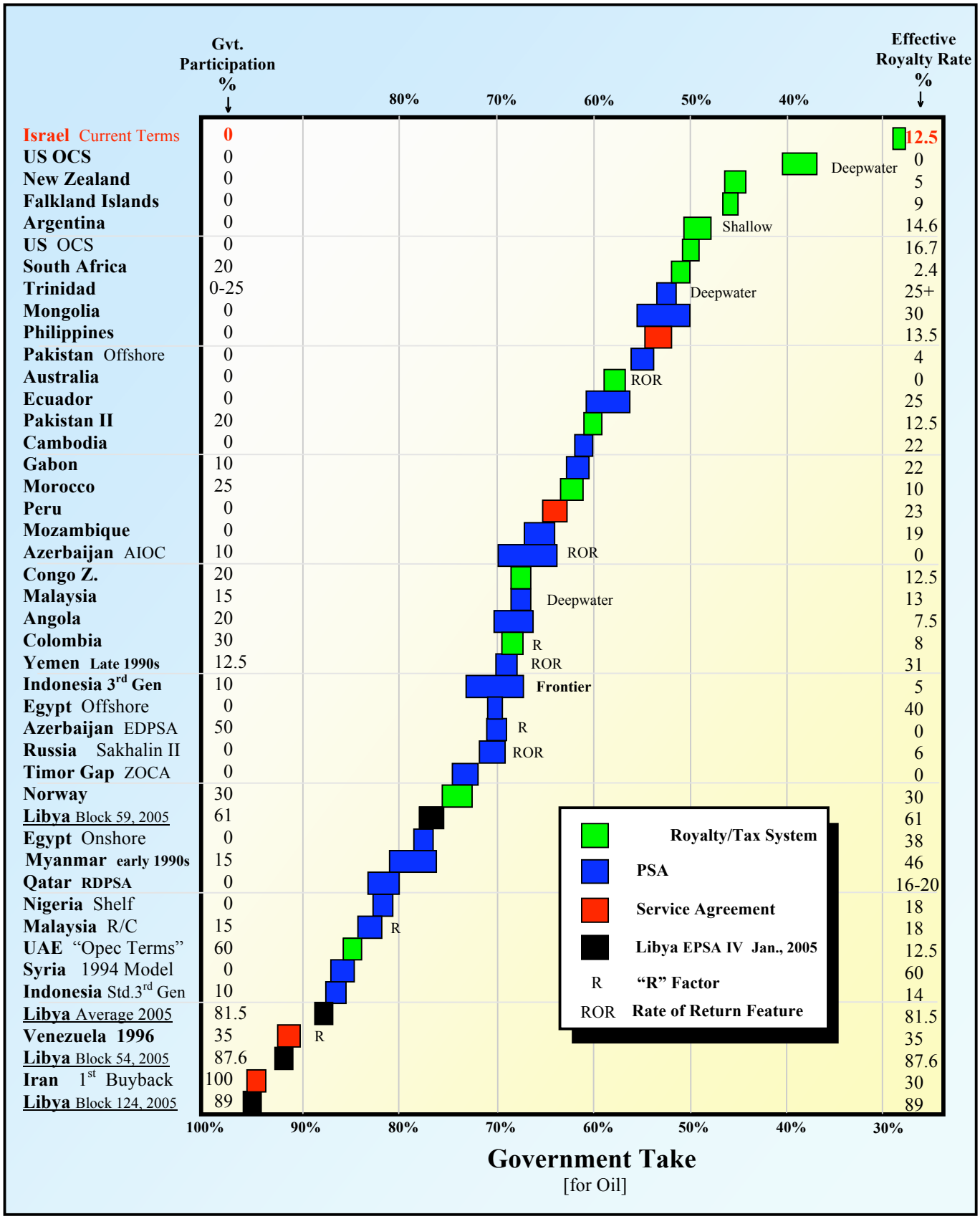

Figure 1 — Israel Current Terms with 18% Corporate Tax Rate

Figure 1 also shows that royalty/tax systems are generally more lenient than PSCs or service agreements in terms of both government take as well as ERR. Royalty/tax systems are also much more likely to be found in countries based on common law principles. There are of course numerous exceptions to these general rules.

Israel's Current System[15]

Israel's current petroleum fiscal regime is derived from Israel's petroleum law that came into effect in 1952 and has not changed much since then.

Table 1

Israel's Current Petroleum Fiscal Regime

Fiscal Element	Rate	Base
Royalty	**12.5%**	Wellhead value
Lease Fee	**Small**	Less than $100,000/year
Depletion Allowance	**27.5%**	Cost Depletion or Percentage depletion (Gross Revenues less Royalty)
Corporate Income Tax	**25 - 18%**	Gross Income minus operating costs, depletion allowance, interest on debt, and royalties.

Note: Not all shareholders of fields in Israel are companies. Some stakeholders pay income tax instead of corporate tax.

Royalties

The royalty rate in Israel is 12.5% of wellhead value. It is our understanding that the method of determining the price at the well-head (or netback) is something that is not stated in any law or regulation in Israel. Table 2 outlines which expenditures were deducted for the sake of royalty determination in the Yam-thetis field:

[15] This analysis of current terms is based on "**Investments in Oil and Gas Exploration in Israel Legal, Economic and Tax Aspects -** Income Tax and Other Taxes", *Zvi Perlmutter, CPA (Israel), CIA (USA)*

Table 2 Royalty Determination	
Deductible Costs (%)	**Type of Expenditure**
70%	(a) Platform and production facilities
60%	(b) Subsea completions
60%	(c) Operating costs
100%	(d) Pipe lines
100%	(e) On-shore facilities (e.g. receiving facilities)
LIBOR	(f) Interest payment

The capital costs (presumably items a, b, d and e) are depreciated on a 'unit-of-production' basis (i.e. each year the percentage of capital costs depreciated is equal to the volume of hydrocarbons produced, divided by the expected ultimate recoverable volume of reserves in the reservoir). The maximum depreciation period is 15 years – and there are rules for corrections or redeterminations in the event of changes to the ultimate volume of production expected.

With the deductions allowed at Yam-thetis the average royalty paid after net-back is reported at 10.6% of gross revenues.

Depletion Allowance

The depletion allowance in Israel is an unusual fiscal feature in today's world. It is the same rate (27.5%) as the old depletion allowance in the US that originated in 1926 and lasting into the 1980s. With this kind of allowance the producer has the option of choosing either 'cost depletion' using the unit-of-production formula (described above) or 'percentage depletion' (27.5% of gross revenues less royalty). The US depletion allowance has considerable history.

The percentage depletion allowance is no longer granted to the major oil companies, but independent companies are still eligible. Since 1984 the rate for independent companies has been set at 15% of gross income. The public attitude in much of the US regarding the depletion allowance is negative.

> "Numerous studies showed that the oilmen were getting a tax break that was unprecedented in American business. While other businessmen had to pay taxes on their income regardless of what they sold, the oilmen got special treatment." . . .
>
> "Such a system was clearly unfair and only benefited a small group of

businessmen in Texas. It seemed only a matter of time before Congress removed this tax loophole. However, these oilmen used some of their great wealth to manipulate the politicians in Washington."

Bryce, R., "Cronies: Oil, the Bushes, and the Rise of Texas, America's Superstate" (2004)

The basic accounting logic behind the depletion concept is based on the notion of a 'wasting asset'. As a field is produced the underlying value is depleted. However, there is counterpoint to this notion described as follows:

"A depletion allowance equal to a given percentage of revenues has been justified as an "extra" allowance to reflect the depletion of reserves and thus the decline in net present value. In general this type of allowance is not justifiable on neutrality or equity grounds. It could only be justified on these grounds as a deduction if the gain to the investor from his discovery of petroleum reserves were included as a positive item in taxable income; given that this does not occur, there is no general case for a depletion allowance."

Kemp, A.G., "**Petroleum rent collection around the world**", Institute for Research on Public Policy, 1987, (pg. 94).

By world standards depletion allowances are not a normal part of petroleum fiscal structures. They have become nearly obsolete.

Corporate Income Tax

Israel's corporate income tax rate has been declining since 2006 from a rate of 35% to the current rate of 25%. It is scheduled to decrease to 18% by 2016. Individual income tax rates in 2010 range from 10% to 45%. There are reduced tax rates for passive income, such as rental or interest income.

The tax base for the corporate income tax is equal to gross income less royalties, operating costs, depletion allowance, and interest on debt. Despite the difference in tax rates for corporations and individuals this analysis is based on the perspective of an IOC. Because the bulk of Israel's hydrocarbons are expected to be produced in the years beyond 2016 we have chosen to use the 18% tax rate in our analysis of current and proposed terms in Israel.

Dividend Tax

The dividend tax rate in Israel is 20-25%. Dividend taxes, from the perspective of international oil companies, are similar to withholding taxes, or repatriation taxes. The tax rates for these levies is often from 10-20% and the tax base is usually after-tax revenues that are repatriated or taken out of the host country. The taxable *event* is when the funds are taken out of the country. Many tax treaties either mitigate or eliminate these taxes and they

often have a considerable number of loopholes. As such, these taxes are rarely included in government take calculations. We have not included them in this analysis. Our understanding is that the dividend tax in Israel is not paid by international companies and it is common for reasons like this that similar levies are not included in typical government take calculations.

Analysis of Israel's Current Terms

The following calculations show the division of revenues and profits for the current system in Israel. The calculations are based on all the elements normally included in government take analysis common to the industry. This approach provides a view of the hierarchy of arithmetic that would be experienced in any given accounting period yet it represents a 'full-cycle' perspective. For example, the gross revenues of 100% represent all revenues expected to be received during the life of a field or a license. Costs as a percentage of gross revenues are estimated at 30% (which is fairly typical worldwide) and includes both capital and operating costs.

ISRAEL – Current oil & gas terms

Assumed Costs Full-Cycle:

Costs (Capex and Opex) = **30% of Gross Revenues** (1)

Gross Revenue	**100.00%**	
Royalty	**- 12.50**	
	87.50	
% Depletion	**- 24.06**	(27.5% of GR less Royalty)
	63.44	
Total Costs	**- 30.00**	
	33.44	
CIT 18%	**- 6.02**	
IOC net After-tax	**27.42**	
Plus Depletion	**+ 24.06**	
IOC Cash Flow	**51.48**	

Government Take	**26.46%**	= (12.5 + 6.02)/(100 - 30)
Contractor Take	**73.54%**	= (51.48)/(100 - 30)

(1) It is common in the industry for costs to amount to around 30% of gross revenues[16].

Government take calculations like the example above effectively collapse all of the relevant means by which a government extracts rent into the equivalent of a single mechanism that could be viewed as an effective tax rate.

[16] The range of costs can be significant depending on field size, reservoir and water depths, reservoir pressures, fluid properties, oil and gas prices, etc.

Conceptually this approach is somewhat abstract in that it is as if all costs are incurred and all revenues are generated and divided in a single accounting period. However, it does provide insight into the division of revenues and profits. In this case based on the assumptions (costs = 30% of gross revenues) the government share of profits (i.e. 'take') is just over 26%.

While there are weaknesses associated with this statistic they are not so great as to mask the disparity in government take in Israel currently with what is considered normal or average worldwide.

Beyond this simple approach most fiscal system analysis is performed with cash flow modeling. The various fiscal metrics discussed in this report particularly government take, effective royalty rate, internal rate of return, and value depend on the nature of the fiscal system, and can vary with:

- Production volumes
- Oil and/or gas prices,
- Costs, and
- Timing

The following figures 2 – 9 are based on cash flow analysis of various field sizes and a range of prices and costs. Figure 2 plots government take against profitability measured in terms of costs as a percentage of gross revenues. It contrasts the current and proposed terms in Israel with typical terms worldwide found in (1) world average terms and (2) the collective terms from the peers chosen for graphical representation below.

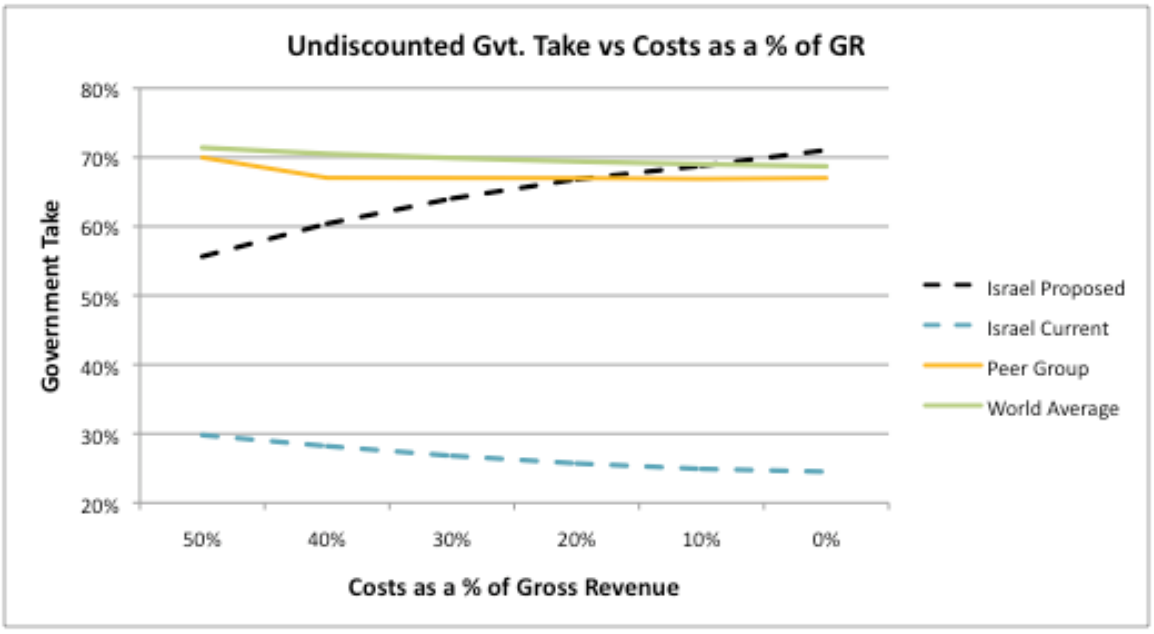

Figure 2

Figure 2 shows that the current terms in Israel are seriously regressive i.e. as profitability increases the government share of profits goes down. Many systems are slightly regressive as can be seen with the world average terms as well as the peer group terms. Israel's proposed terms are progressive as can be seen here with the dashed black line. As profitability increases throughout this range government take increases from around 57% to 70%. This graph in combination with Figure 1 illustrates to a large extent how remote the current terms are from what is happening worldwide.

Israel's Market Position and Proposed Terms

All governments have their own unique boundary conditions, concerns and objectives. Israel's situation is characterized by a unique combination of conditions by world standards. The boundary conditions and dimensions are considerable and the situation is dynamic. Some of the key aspects include:

- Geo-political tensions
- Significant gas reserves and potential
- Deepwater
- Proximity to market

None of these dimensions are trivial. And, some of these elements highlight disadvantages while others indicate strong advantages. However, no country is without its particular characteristics and boundary conditions of some sort. And, Israel is not unique with respect to geo-political tensions.

One of the harshest boundary conditions regarding this particular subject is poor geology. Fortunately that is not the case in Israel. Furthermore, while the most notable discovery in Israel is the deepwater Tamar gas discovery by world standards it is not very far offshore and is close to a market outlet. This is rare for many gas discoveries around the world. So Israel has both advantages and disadvantages that are difficult to measure in combination. In our opinion nothing in isolation or in combination justifies such extreme terms for Israel's hydrocarbon sector.

Israel's Proposed Terms

The proposed new terms in Israel include the existing royalty and income tax as well as a proposed special petroleum tax (SPT). The proposed terms also do away with the depletion allowance. In summary therefore the system is comprised of three separate rent extraction mechanisms listed in order of sequence during ordinary accounting calculations:[17]

Key Fiscal Elements of Israel's Proposed Terms

Royalty	**12.5%**
Special Petroleum Tax	**0 - 60%**
Income Tax	**18%**

Royalty – As discussed previously while the official royalty rate is 12.5% there are deductions applied. This is not unusual around the world but as a matter of convention for a typical government take analysis the official rate is used as discussed previously. The royalty provides the only guarantee that the government will receive a share of production or revenues in any given accounting period. With profits-based elements, like the SPT and the income tax, with sufficient tax deductions the IOC can be in a 'no-tax-paying position'. This is common to almost all systems around the world.

The 12.5% royalty is relatively high as far as simple royalties go. The world average is only around 7-8%. The world average for royalty/tax systems is around 10% and for PSCs around 5%. However, as mentioned earlier the world average ERR is around 20%. So by world standards the 12.5% royalty would be considered to be relatively mild from an industry investor point of view.

Special Petroleum Tax - The proposed SPT ranges from 0% to 60% based upon what is known as an investment multiple (IM). The IM is defined as the accumulated pre-tax receipts received by the IOC (less recovered operating costs) divided by accumulated capital expenditures and exploration costs *uplifted* by 50%.[18] An uplift is a fairly common feature of many systems. For example they have been used in Norway, Angola, Alaska, Indonesia, Morocco, Netherlands, Timor Leste, Denmark, Nigeria and Thailand.

[17] For this analysis, and consistent with industry standards the dividends tax and value added taxes are not included.

[18] For example, in the IM calculation if exploration costs are $100 million the denominator of the IM Calculation will use $150 million to represent the high-risk exploration costs.

In each accounting period the IOC accumulated pre-tax receipts, less operating costs, are divided by accumulated capital expenditures (which includes development expenditures and the uplifted exploration costs). The corresponding tax rate is then calculated and is used in the subsequent accounting period.

This mechanism is somewhat similar to other such devices around the world known as "R-factors"[19] of which there are a number of variations on the theme. These mechanisms are found in about 10% of the countries worldwide. The IM is a variation on the basic R-factor theme and similar to what has been used in India for a few decades. It essentially works like a "return on investment" index. It will respond to both fluctuations in oil prices and/or variations in capital costs. Furthermore, this variable tax will adjust to variations in costs and prices simultaneously.

Special Petroleum Tax (SPT)

Investment Multiple	Special Tax Rate
0 - 1.5	0%
1.5 - 2.3	20% - 60% (Interpolated)
> 2.3	60%

$$\text{Investment Multiple} = \frac{\text{IOC accumulated pre-tax receipts less Opex}}{\text{Accumulated Capex + uplifted Exploration Costs}}$$

Once the IOC has received its investments back and an additional 50%, the SPT rate increases beyond the initial 0%. When the IM ranges between 1.5 and 2.3 the tax rate is interpolated between 20% and 60%. An IM of one (1.0) represents the point at which the IOC has recovered all of its (nominal) capital costs including exploration costs uplifted. The SPT rate stays at 0% until the accounting period after the IM equals 1.5.

With the IM mechanism, government take is lower for smaller less-profitable fields and higher for larger more profitable fields.

The marginal government take with the proposed system is 28%[20] as long as the IM is less than 1.5. When the IM is greater than 2.3 the marginal government take is 71%. Therefore

[19] R-factors typically represent a company's accumulated receipts divided by accumulated expenditures (both Capex and Opex). "R" stands for 'ratio", i.e. the ratio of accumulated receipts divided by accumulated expenditures.
[20] Assuming income tax rate is 18%.

over the life of a field or license the overall government take would never exceed 71% — that is just the highest *marginal* rate. The SPT will make Israel's system one of the more progressive in the world. Most systems are slightly regressive.

Income Tax – The income tax would behave as before. The SPT would be deductible for the purpose of calculating income tax.

Dividend and value added taxes – In this analysis the dividend and VATs are specifically not included. This is common for the kind of comparative analysis performed here and that performed by leading consulting firms.

Analysis of Israel's Proposed Terms

The most prominent differences between the current terms in Israel and the proposed terms are the abolition of the depletion allowance and the addition of the SPT.

The following calculations and flow diagram illustrate the hierarchy of accounting operations for the proposed system. In this example, it shows that if costs equal 30% of gross revenues and the weighted average SPT amounts to 45% on average (full-cycle) then government take should be around 63%. Detailed analysis is performed with cash flow analysis and the results are depicted in graphs 2-9.

Israel's Proposed Terms

Assumed Costs Full-Cycle:

Costs = 30% of Gross Revenues

Gross Rev	**100.00%**	
Royalty	**- 12.50**	
	87.50	
Total costs	**- 30.00**	
	57.50	
SPT 0-60%	**25.88**	(Assumed 45% Average full-cycle)
Pre-Tax Income	**31.62**	
CIT 18%	**- 5.69**	
IOC Cash Flow	**25.93**	

Government Take **63%** = (12.5 + 25.88 + 5.69)/(100 - 30)

Contractor Take **37%** = (25.93)/(100 - 30)

Peer Group Analysis

One of the most common tools for fiscal system analysis and design is peer group analysis. The challenge with this approach is to find comparable countries or provinces. Perfect comparability is an impossibility in almost all cases even if, for example, two countries share a geological province (like the UK and Norway in the North Sea).

We have undertaken this effort with a general view to gathering countries or examples from provinces that might not be considered the most favorable/exciting. For example, gas is usually not as highly prized as oil. And, while deepwater provinces these days are proving to be geologically interesting these are very high-cost provinces.

The exciting plays in Israel are in deepwater and deepwater terms worldwide have historically been relatively lenient (in terms of government take). Lately though the disparity between gas terms and oil terms (where there is a difference) and the difference between deepwater terms and conventional (non-deepwater) terms has narrowed. The high cost of deepwater is a factor as well and the peer group is heavily influenced by deepwater terms.

One aspect of Israel's situation that is difficult to quantify is that much of the deepwater play is located close to shore and to market. In much of the world, because of the high costs and remoteness from market the terms 'gas' and 'deepwater' are almost considered to be mutually exclusive. Israel's situation in this respect is a rare and attractive thing by world standards.

Special consideration was also given for provinces/countries considered to be relatively sophisticated, i.e. the system has undergone considerable evolution and is the result of extensive experience with all phases of operation, (exploration, development and production operations). Indonesia is an example because this country has been actively involved in licensing for the past 50 years and for many years it represented around half of the activity in Southeast Asia.[21] Because of this and the fact that Indonesia pioneered the PSC for this industry it is often, as a matter of convention, a standard for comparison. For example one of the most famous statistics in the world for many years (1974-2000) was the old 85% government take in Indonesia for oil. Indonesia typically provides better terms for gas and for frontier regions.

Therefore, particular consideration in the peer group was given to countries that were either (1) gas prone, (2) deepwater, (3) somewhat risky beyond ordinary geological risk, and (4) relatively remote with respect to logistical centers and (5) experienced with respect to the international market for exploration acreage and projects.

[21] In terms of licensing, drilling, production etc.

Country/System	Comments
Australia – Federal	Gas prone, remote, offshore
Bangladesh	Remote, gas prone, modest infrastructure
Cambodia	Remote, gas prone, problems with competing territorial claims
Colombia	Relatively sophisticated terms, seeking greater investment
Egypt	Deepwater, gas and oil, sophisticated/experienced
E. Indonesia	Gas prone, deepwater and remote, sophisticated
Ghana	Remote, new entrant
Libya	Libya is a regional peer and shares part of the Eastern Mediterranean basin. The terms in Libya were also determined for the most part by competitive bidding (i.e. what are sometimes referred to as 'self imposed' terms).
Mauritania	Deepwater, relatively remote
Namibia	Deepwater, remote
Nigeria-STP	Deepwater, sophisticated/experienced
Norway	Harsh environment and frontier regions, sophisticated/experienced
Pakistan	Deepwater and frontier regions, fairly experienced
Syria	Remote, regional, experienced
Turkmenistan	Deepwater, remote, difficult environment
UK	Harsh environment, sophisticated, common benchmark

Note: The underlined countries were selected for graphical representation and collectively

Table 3 summarizes representative statistics from these provinces in terms of government take and effective royalty rate.

Most of these countries have either deepwater or a relatively difficult environment or conditions that place the country in less-than-top-tier status. Some might argue that the size of the Tamar discovery and the Leviathan prospect should easily place Israel into the top-tier where governments are able to extract well over 80% of the profits from the petroleum industry (see Figure 1). But this is only one of many aspects that are part of the mix that characterizes any particular province.

Table 3
Israel Peer Group Countries/Regimes

Country/Regime		Government Take %			Effective Royalty Rate %	Comments
		Less Profitable	More Profitable	Avg.		
1	Australia	53	56	54.5	0	Federal Waters
2	Bangladesh	70	70	70	35	
3	Cambodia	66	65	65.5	17	
4	Colombia	60	56	58	11	Post 2004
5	Egypt	76	75	75.5	49	Alliance
6	Indonesia	65	65	65	4-5	Eastern Frontier
7	Libya	88	88	88	80	
8	Ghana	53	56	54.5	4	
9	Mauritania	67	68	67.5	14	
10	Namibia	60	64	62	5	1998 Incentives
11	Nigeria – STP	67	69	68	17	
12	Norway	76	78	77	0	
13	Pakistan	64	63	63.5	15	Deepwater
14	Syria	74	74	74	44	
15	Turkmenistan	66	76	71	17	
16	UK	50	50	50	0	Non-legacy fields
	Peer Group Average	65.9	67.1	66.5	19.7	
	Israel Current	28	24	26	12.5	
	Israel Proposed	60	67	64	12.5	

Statistics from Daniel Johnston & Co., Inc. Database

The petroleum industry is active in all of the countries in the peer group to various degrees. Our objective is to characterize and quantify the current and proposed terms and show how they compare and contrast with what is happening in much of the rest of the world.

In part of our effort to do this our analysis focuses on a representative selection of countries from the Peer Group. These include:

- Eastern Indonesia
- Norway
- Egypt
- United Kingdom
- Mauritania

Collectively these countries capture much of the range of government take from the peer group and the average take from this select group of countries mirrors that of the entire peer group ranging from 66-67%.

Eastern Indonesia

The terms for the Eastern frontier regions of Indonesia are typically more lenient (i.e. lower Government Take) than for the more prominent oil-prone regions in Western Indonesia. The government take for gas in Eastern Indonesia is around 65% but the take for oil in Western Indonesia is over 85%. The Eastern Indonesian frontier terms are relevant because of the remoteness of the region, the lack of infrastructure, and the perception that it is gas-prone. Furthermore, Indonesia has considerable experience marketing license rights for exploration and/or development projects that goes back over 60 years. Indonesia has been a standard-of-comparison for many years.

Norway

Norway is another standard by which other countries are compared because it is perceived as having been relatively successful in administering its petroleum sector and because for much of the OECD world its terms are some of the toughest with respect to government take (at around 75 – 77%). Norway also has deepwater and even in most of the moderate water depths is considered a harsh, high-cost, frontier environment. Part of Norway's ability to extract such a high rent is due to liberal provisions for explorers where Norway reimburses most of the costs of unsuccessful exploration efforts (around 72%) and Norway has no royalty (i.e. zero effective royalty rate).

Egypt

Egypt is a good regional peer for its geological and geographical proximity to Israel. Egypt also has considerable experience with the industry and has seen extensive activity over the years despite terms that are relatively tough with high government takes (on the order of 75-85% typically) as well as being heavily front-end loaded (with effective royalty rates on the order of 35% to over 50%). We have chosen a government take at the lower end of the scale (for Egyptian agreements) because we are focusing primarily on (1) gas and (2) deepwater.

United Kingdom

Like Norway the UK is often a benchmark for fiscal analysis. The UK has a high government take for the old legacy fields at 75% but the terms for new exploration and development yield a take of 50% (which is used in this analysis). The UK has a variety of offshore environments in various water depths and virtually all with the well-known, harsh North Sea weather conditions. However, the UK sector of the North Sea has often been one of the most active offshore provinces in the world.

Mauritania

Mauritania is known mostly for its deepwater provinces and has had limited exploration success. However, the terms yield a government take of around 65% and an effective royalty rate of 14%. Some analysts report contracts in Mauritania with government take on the order of 75% but we have no firm evidence of this at this time.

United States Deepwater – Not used in this analysis

Deepwater terms in the outer continental shelf are based on a one sixth (1/6) royalty and a federal tax rate of 35%. It is often included with analysis such as this but signature bonuses are not included in the typical analysis of terms worldwide. The impact in the US is significant. This can be one of the weaknesses of this kind of analysis but only where signature bonuses are significant. Therefore we believe it would be misleading to include the US OCS as an example based on standard 'take' analysis. For further reference, considerable analysis has been done on this subject.[22,23]

Analytical Approach

Analysis of the peer group was performed using a variety of scenarios onshore, offshore (shelf) and deepwater. But the presentation in this report focuses on deepwater field sizes in the range of 2 to 10 trillion cubic feet (TCF) of gas, with gas prices ranging from US $2.00 to $8.00/MCF[24] and total costs (capital and operating) ranging from US $0.60 to $ 1.40/MCF. Comparison is done assuming that prices and costs are the same in each country.

The following graphs show how the proposed terms compare with other systems around the world. They illustrate government take under various conditions and they show the perspective of the IOCs with respect to (a) net present value to the IOC (of a potential discovery or development), (b) expected internal rates of return for the IOC and (c) expected value (or 'risked value'). These metrics are common to the international oil industry and they show that Israel's proposed terms are clearly competitive.

Figure 3 shows government take in deepwater with field sizes ranging from 2 to 10 TCF. Analysis was based on a price of $5.00/MCF (in real terms) and total costs ranging from $1.50/MCF for a 2 TCF field to $0.86/MCF (also in real terms) for a 10 TCF field.[25] With

---

[22] "Analysis of Government Take in the United States Outer Continental Shelf", **American Petroleum Institute**, D. Johnston, 12 Dec., 2007

[23] 50 "Bonuses enhance upstream fiscal system analysis", D. Johnston, A. Derman, **Oil & Gas Journal**, 8 Feb., 1999. pp. 51-55.

[24] Gas is typically sold on a heating value basis – Millions of British Thermal Units (MMBTUs). Currently gas prices (US Henry Hub) are on the order of $4.00/MMBTU. The dry gas at Tamar (99% methane) should yield approximately 1,030 BTU per cubic foot. So for the sake of simplicity we have assumed that 1 MCF is equal to 1 MMBTU. Thus $4.00/MCF = $4.00/MMBTU.

[25] The Tamar field costs are expected to fall somewhere in this range (See Appendix 3).

the economy-of-scale and increased profitability associated with the larger fields government take under the proposed terms and the Mauritanian system increase slightly due to the fiscal design. Most other systems are relatively neutral or slightly regressive.

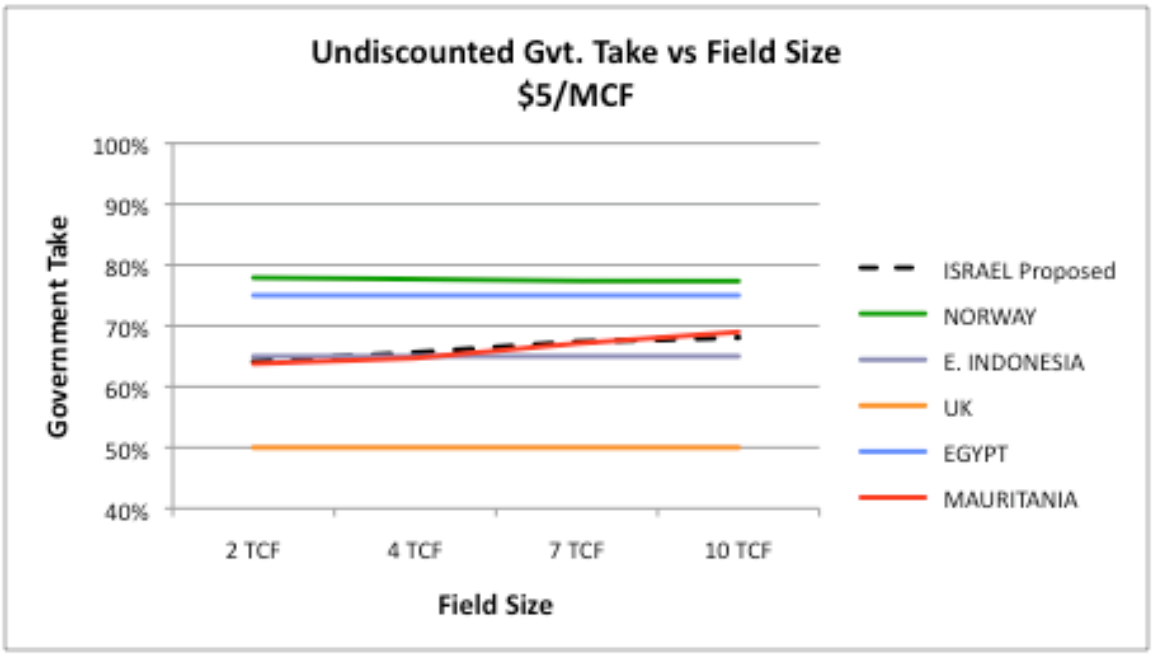

Figure 3

The UK terms represent the low end of the scale for the peer group. The Norwegian and Egyptian terms depicted here represent the upper end of the scale. So the sampling of systems chosen for the peer group are slightly skewed towards the lower end of the Worlds' systems scale and around 5-8 percentage points lower than world average. Israel's current terms would be below the bottom of the Y axis here (below 40% take).

Figure 4 shows the same graph as Figure 3 but government take is discounted at a nominal rate of 10%.[26] The discount rate of 10% corresponds fairly closely to what many oil companies use as a 'global discount rate' for investment analysis purposes.[27] Both graphs show that Israel's proposed terms are competitive by the standards of this particular IOC perspective.

[26] At a time when IOC weighted average cost of capital (WACC) ranges from around 8-9% (nominal). Companies typically add a couple of points to arrive at a 'global discount rate' also called 'hurdle rate' representing their investment portfolio. The rationale for the differential between WACC and the higher global rate is for an added 'risk cushion' or 'safety margin'.
[27] The global rate is not the same as a project-specific discount rate that takes into account specific aspects of a particular project/country etc.

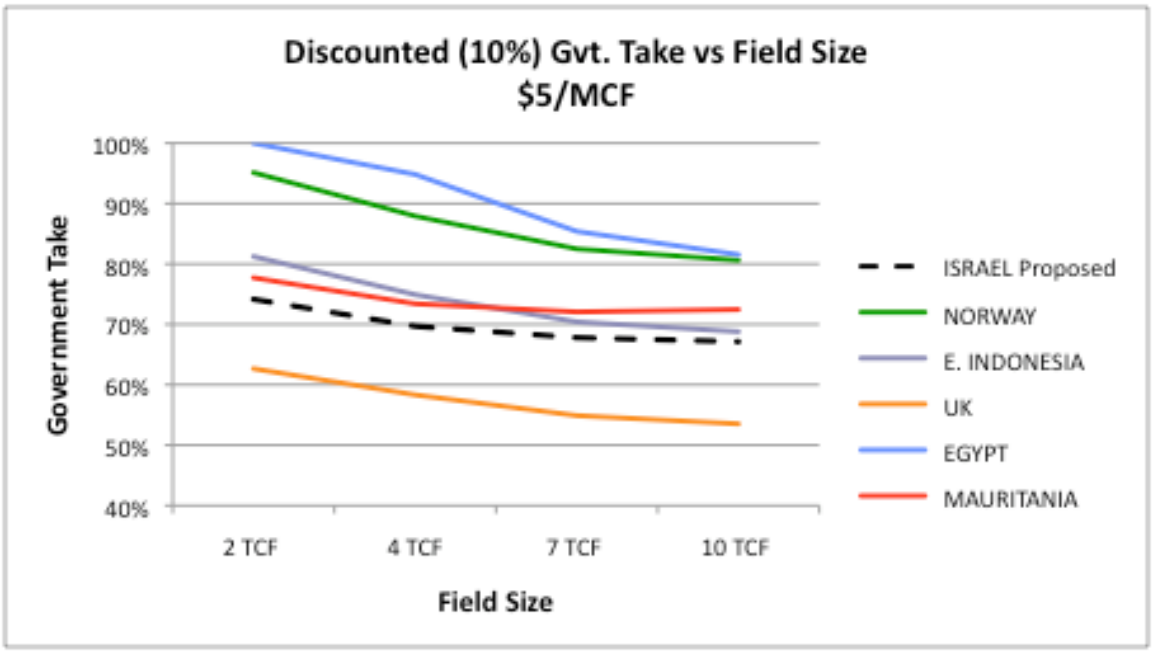

Figure 4

From a present value point of view the systems look much more dynamic. As profitability increases the discounted government take approaches the undiscounted government take. Never-the-less, the proposed terms in Israel are clearly competitive.

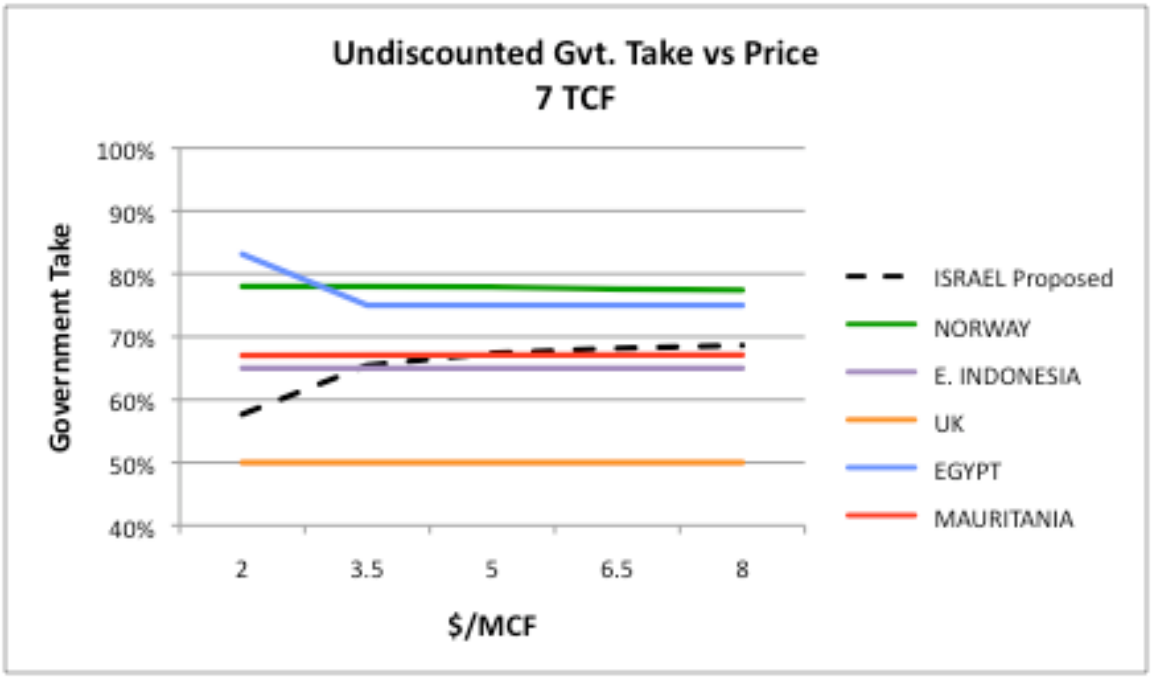

Figure 5

Figure 5 shows that government take for the proposed system is modest under low prices but progressive and increases with higher prices. At gas prices in the range of US$ 2.00 to $ 5.50/MCF, government take with the proposed terms climbs from around 58% to around 68%. With higher prices the government take increases as a result of the investment multiple which governs the Special Profits Tax (SPT). Throughout this same range (where the proposed terms are progressive) the Egyptian system is strongly regressive due to the fiscal structure. In Egypt it is the result of a low cost recovery limit.

This highlights one of the objectives of the Committee to create a *progressive* system that can accommodate smaller, less profitable discoveries yet take a larger share of profits with the more profitable fields. This is a common objective with many governments but most systems and most sliding scales fall short of this objective.

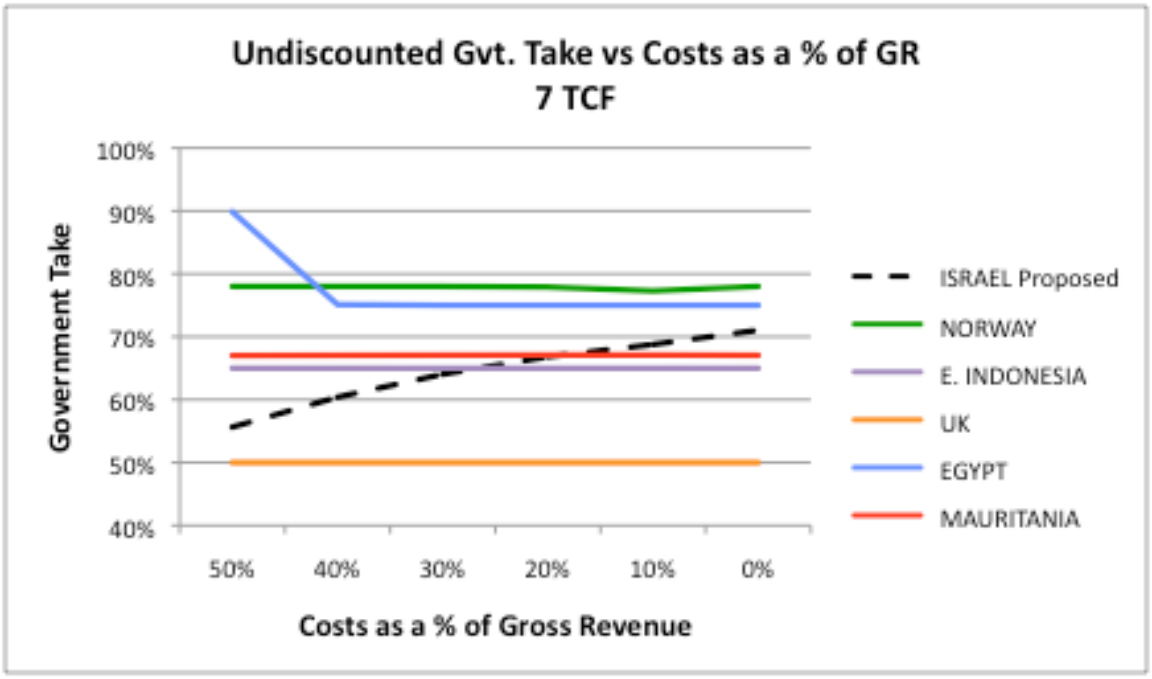

Figure 6

Figure 6 illustrates the government take for a 7 TCF field at various levels of profitability measured in terms of costs as a percentage of gross revenues. For most of the developments worldwide, costs as a percentage of gross revenues ranges from 20 – 40%.

This graph shows how progressive the proposed system is with respect to either prices or costs or both in combination. Few systems are able to accomplish this objective. Of this group of systems the proposed terms in Israel are the most progressive but the terms are not aggressive. In fact the proposed terms are conservative. If Israel wanted to be

aggressive the take would exceed that of Egypt and Norway. Over 30% of the systems worldwide have a government take greater than these two examples.

Investor Perspectives

Figures 7, 8 and 9 show investor perspectives in terms of internal rate of return (IRR), net present value (NPV), and 'risked value' or 'expected value' (EV) all calculated from the perspective of an international oil company (IOC).

Figure 7 shows that in each case, from the investor point of view, the discounted cash flow value (discounted at a nominal 10% discount rate) to the IOC increases with increasing field size. It also shows that with the exception of the UK Israel offers the most attractive terms of this group and is clearly competitive.

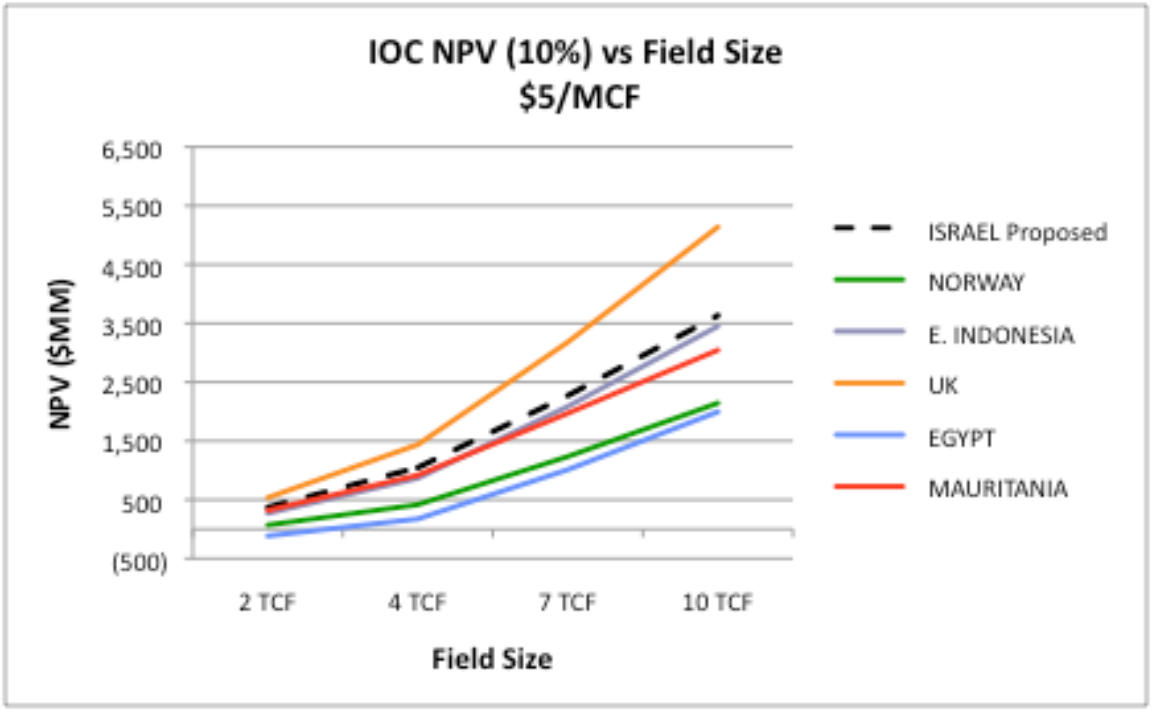

Figure 7

Figure 8 illustrates that Israel's proposed terms are also competitive in terms of the IOC internal rate of return (IRR) generated at a gas price of $5.00/MCF for various field sizes. In fact, in terms of IOC IRR, the proposed terms compete easily with Norway, Egypt, Eastern Indonesia and Mauritania. The reason the IRR is so attractive, is because the investment multiple-based special profits tax increases with profitability and thus much of the government take is 'back-end loaded'.

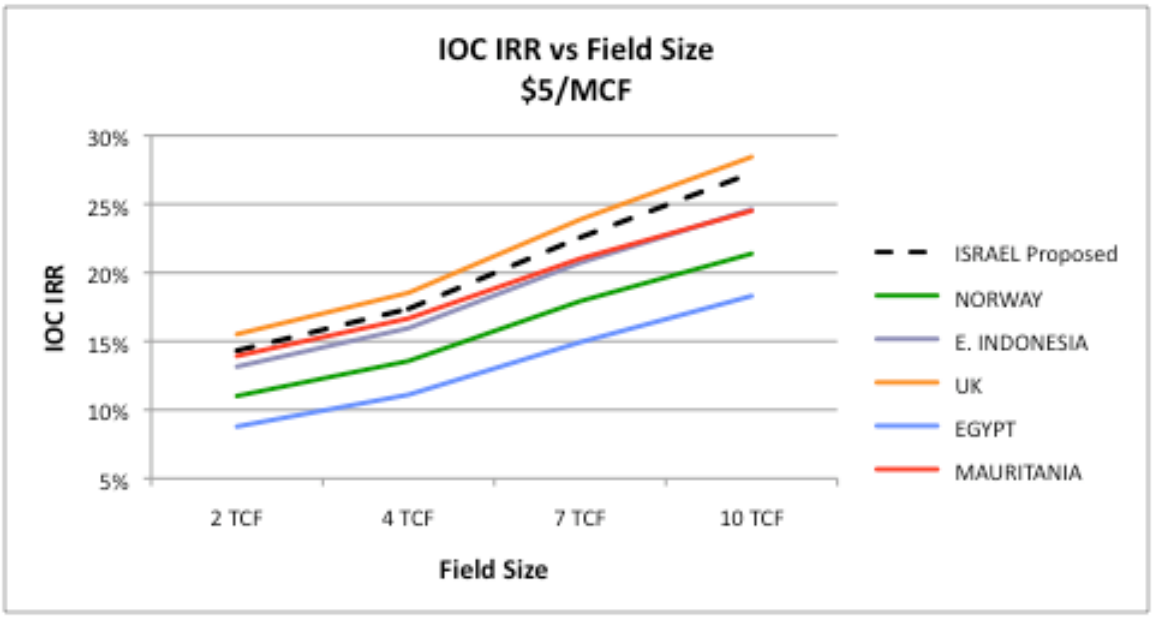

Figure 8

Figure 9 compares the "risked value" or "expected value" discounted at 10% ("EV10"). The analysis is done for a price of $5.00/MCF. The EV10 is a direct reflection of exploration attractiveness. The EV10 was determined assuming a success rate of 20%, or one discovery for every five exploration wells, assumed to cost $100 MM each. The EV approach is one of the most common tools in the industry. For this analysis it has been kept simple but the results are so strongly driven by NPV and government take that the results are not surprising. An example of the calculation of EV is shown in Appendix 6.

The EV10 for the proposed terms for Israel are clearly competitive and significantly superior to those of Norway and Egypt. The proposed terms are marginally more attractive than Eastern Indonesia and Mauritania which track each other so closely on this graph that the Indonesian curve is hard to see.

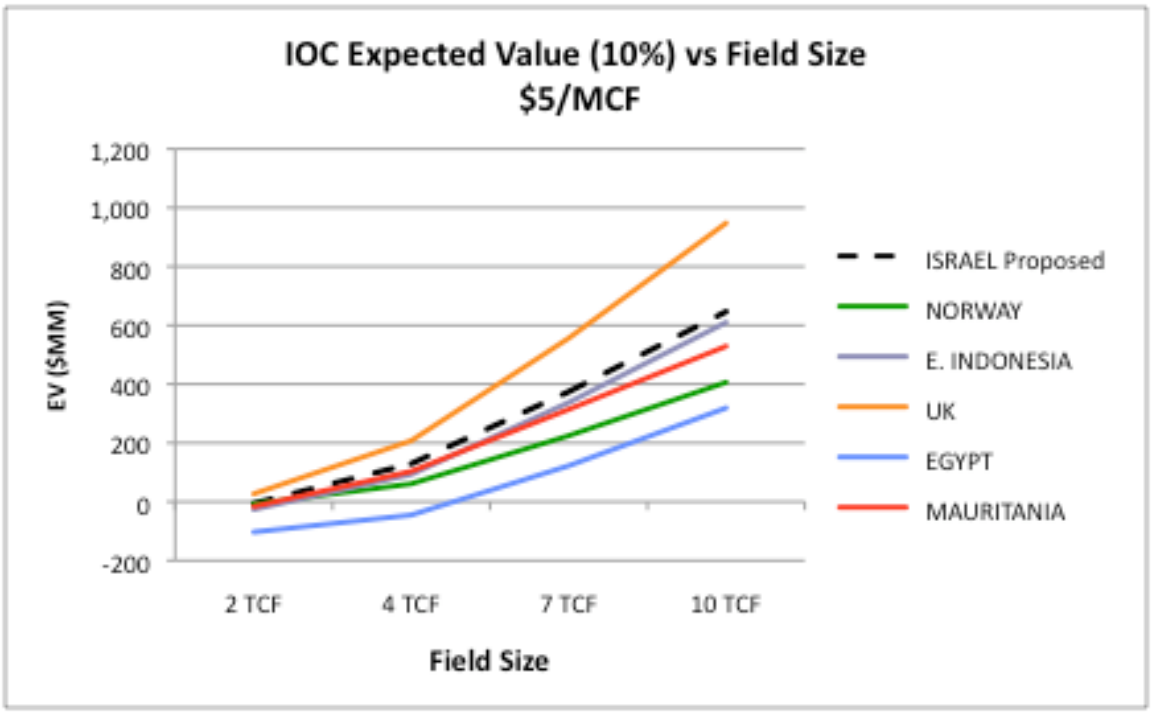

Figure 9

Commentary/Summary

The proposed system is a huge improvement over the current terms. The division of profits is more in-line with the conditions in Israel and the state-of-the-art in fiscal design. The system would be one of the more flexible and progressive systems in the world and represents a fair-minded and rational approach to the objectives outlined by the Committee.

With this structure the interests of both parties to the agreement are well aligned. The IOCs would have a strong incentive to maximize profits (which benefits both parties) and a healthy incentive to keep costs down.

Appendix 1 — Abbreviations and Acronyms

$M	Thousands of Dollars
$MM	Millions of Dollars
Avg.	Average
BBL	Barrel
BBLs	Barrels
BCM	Billions of Cubic Meters
BOPD	Barrels of Oil per Day
Capex	Capital Expenditures
CIT	Corporate Income Tax
DCF	Discounted Cash Flow
DD&A	Depreciation, depletion and amortization
Dev.	Development
Expl.	Exploration
Gvt.	Government
G&A	General and Administrative expenses (usually same as "overhead")
ERR	Effective Royalty Rate
EV	Expected Value
Gvt.	Government
IM	Investment Multiple
IOC	International Oil Company
IRR	Internal Rate of Return (normally the same as ROR)
JOA	Joint Operating Agreement
LIBOR	London Inter Bank Offered Rate
m	Meters
M	Thousands
MCF	Thousands of cubic feet
MCFG	Thousands of cubic feet of gas
Md	Milli Darcies (permeability)
MMCFD	Million cubic feet of gas per day
MM	Millions
MMm^3	Millions of cubic meters
MSL	Mean Seal Level
N/A	Not Applicable
No.	Number
NOC	National Oil Corporation
OECD	Organization for Economic Cooperation and Development
Opex	Operating Costs
P/O	Profit Oil
PSA	Production Sharing Agreement (Same as PSC)
PSC	Production Sharing Contract (Same as PSA)
PSI	Pounds per Square Inch (also 'Psi')
ROR	Rate of Return
R factor	"Ratio" of Contractor cumulative receipts to cumulative expenditures
R/T	Royalty Tax (system) (Also referred to as a 'concession')
SP	Success Probability
Sw	Water Saturation
TCF	Trillion Cubic Feet (of gas)
VAT	Value Added Tax
WACC	Weighted Average Cost of Capital

Appendix 2 — Summary of Technical Data on Offshore Gas Fields

	Noa	Nir	MariB	Tamar	Dalit
Discovery Year	**1999**	**2000**	**2002**	**2009**	**2009**
Water Depth (MSL) [Feet]	**800** [2,625]	**120** [7,620]	**250** [820]	**1,700** [5,580]	**1,400** [4,590]
Top Reservoir Depth (MSL) [Feet]	**2,100** [6,890]	**2,000** [6,560]	**1,900** [6,230]	**4,560** [14,961]	**3,500** [11,480]
Reservoir Type	**Qtz Sand**	**Qtz Sand**	**Qtz Sand**	**Qtz Sand**	**Qtz Sand**
Gas Type	**dry**	**dry**	**dry**	**dry**	**dry**
Gas Saturated Thickness (m)	**20**	**30**	**100**	**150**	**50**
Porosity (%)	**22**	**25**	**28**	**24**	**29**
Permeability (mD)	**500**	**600**	**3,000**	**1,000**	**2,300**
Water Saturation (Sw %)	**28**	**27**	**20**	**23**	**17**
Temperature (F)	**121**	**130**	**150**	**180**	**125**
Formation Pressure (psi)	**3000**	**3200**	**3,420**	**8,200**	**6400**
Pressure Gradient (psi/ft)	**.375**	**.420**	**.472**	**.472**	**.480**
Production (BCF/BCM)	**-**	**-**	**731/21***	**-**	**-**
Recoverable Reserves (BCF/BCM)	**350/10**	**280/8**	**1120/33**	**9,450/270**	**209/6**

* Production started in 02/ 2004

From: "A Summary of Petroleum Exploration and Production Activity in Israel", Michael Gardosh and Victor Baryudin

Appendix 3 — Example of Regressive Systems

Example System:

Royalty	**15%**
Tax Rate	**40%**

	Less Profitable	**More Profitable**
Assumed Costs Full-Cycle:[28]	**40%**	**10%**
Opex & Opex		
Gross Rev	**100%**	**100%**
Royalty	**- 15**	**15**
	85	**85**
Total costs	**- 40**	**10**
	45	**75**
CIT 40%	**- 18**	**30**
IOC Cash Flow	**27**	**45**
Government Cash Flow	**33** (15+18)	**45** (15+30)
Government Take	**55%** (15+18)/(100 - 40)	**50%** (15+30)/(100 - 90)
Contractor Take	**45%** (27)/(100 - 40)	**50%** (45)/(100 - 90)

In this example the difference in profitability could be the product of variations in price or costs or both. For costs to be as low as 10% of gross revenues is an unusually profitable situation. For costs to be as high is 40% is not quite so unusual. Both parties benefit from increased profitability but, with increased profitability in this example the government share dropped from 55% to 50%. This is a regressive system. It is because of the royalty.

Many governments worldwide during the price shock of 2007-2008 (and the run-up prior to the peak), were not happy to see their share of profits drop (even though they were happy with the increased revenues to the State). This is one of the key sources of inspiration for progressive fiscal systems.

[28] Costs as a percentage of gross revenues.

Appendix 4 — Petroleum Fiscal Changes

Change in Fiscal Terms 2002-2008*

NOTE: All the changes in the following list were detrimental to the IOC interests

Country	Year	System	
Algeria	**2006**	**PSC**	WPT 50% production-based levy (Anadarko)
Argentina	**2002**	**R/T**	Oil Export Duty (ED) introduced - everything
Argentina	**2004**		Oil ED increased gas ED introduced - everything
Argentina	**2006**		Gas ED increased
Australia	**2008**	**R/T**	Excise on condensate – NWS and Onshore
Bolivia	**2005**	**S/A**	Royalty from 18-50%
Bolivia	**2006-7**		Contracts re-negotiated
Canada (Alberta)	**2007**	**R/T**	Increased royalty rates
Canada (Newf.)	**2007**	**R/T**	Increased royalty rates – specific new fields
China	**2006**	**PSC**	WPT introduced – all PSCs
Ecuador	**2006**	**PSC**	WPT 50% introduced – all PSCs
Ecuador	**2007**	**PSC**	WPT increased to 99% – all PSCs
India	**2006**	**PSC**	Cess increased – all fields/companies
Italy	**2008**	**R/T**	Increased tax rate – all fields/companies
Kazakhstan	**2008**	**PSC**	Law passed allowing retrospective changes
Nigeria	**2008+**	**PSC**	Working on new PIB
PNG	**2008**	**R/T**	Additional Profits Tax re-introduced - LNG
Russia	**2002**	**R/T**	Royalty/tax terms overhauled–all fields/companies
Russia	**2003**	**R/T**	MET (Royalty) and export duty increased
UK	**2002**	**R/T**	Supplementary Charge (CIT to40%) All fields/Co's.
UK	**2005**	**R/T**	Added increase CIT to 50% **-**all fields/companies
US (Alaska)	**2005**	**R/T**	Production tax rules changed
US (Alaska)	**2006**	**R/T**	Production tax replaced with profits tax (PPT)
US (Alaska)	**2007**	**R/T**	Production tax rate increased
Venezuela	**2002-6**	**PSC** (E&P)	Contracts changed to "empresas mixtas" – All fields/companies
Venezuela	**2002-6**	**S/A Marg'nl**	Changed to empresas mixtas
Venezuela	**2002-7**	**R/T heavy**	Changed to empresas mixtas
Venezuela	**2008**	**R/T**	WPT Introduced
Vietnam	**2008**	**PSC**	Export duty rate increased (twice)-All

Adapted from: "International Energy Investment Law: The Pursuit of Stability", Cameron, P., Oxford University Press, 2010 (Chapter 1, pages 10-11).

Appendix 5 — Weaknesses of the Government Take Statistic

Adapted from "International Petroleum Fiscal System Analysis and Design" Course Workbook, Daniel Johnston & Co., Inc.

- Does not adequately capture signature bonuses
  Unless analysis addresses both present value and risk.

- Does not address "how" Government takes (such as front-end-loading vs back-end-loading).
  The companion statistic Effective Royalty Rate (ERR) helps address this.

- Says nothing of timing and time value of money (unless "discounted")
  Discounted government take statistics are always more meaningful if they are accompanied by undiscounted take statistics. One interesting study compared discounted government take with undiscounted take statistics as a measure of "front-end-loading".

- It's macroeconomic scope is too narrow.
  Does not measure all of the means by which Gvt. benefits i.e. Gross Benefits
  Things such as employment and ancillary industries

- Says nothing of the effects of ringfencing or lack of ringfencing

- Does not measure any aspects of contract or system stability although systems with a high government take are considered to be less likely to undergo change with a positive price shock.

- Reserve/lifting entitlements and "ownership" are not accounted for with the Government Take statistic.

- Does not differentiate between diverse work program provisions

- By definition "Crypto taxes" don't get captured. Crypto taxes are elements that cause financial pain to an oil company but are not typical levies that can be evaluated in terms of (1) rate and (2) base. Such things include, inordinately high *local content* provisions, hostile audits, heavy inefficient bureaucracy, unreasonable permitting requirements etc.

- It is not as relevant in some important situations Government take for exploration may not be the same statistic for *development* projects because of the Gvt. participation element.

Appendix 6 — Expected Value Analysis

This following is a basic equation used in exploration risk analysis. This formula provides the cornerstone of risk analysis and investment decision-making. The rule is that if EV is positive, then the risk-weighted reward outweighs the risk-weighted cost of failure.

The expected value logic provides the basis for billions of dollars of exploration investments. It is normally more complex with the common practice in the industry of using multiple outcomes (at least 3) on the "reward side" of the equation.

Expected value = Reward * SP - Risk capital * (1-SP)

Where:

Risk capital = Costs associated with testing a prospect. Typically consists Of dry hole costs , geological/geophysical costs, and possibly a signature bonus.

Reward = Present value of possible successful exploration efforts based upon discounted cash flow analysis of a hypothetical discovery typically discounted at (or close to) corporate cost of capital. [see tables T 1.3 and T 1.4]

SP = Probability of success (Likelihood of actually making a discovery – Estimated by geotechnical personnel.)

1 – SP = Probability of failure (Likelihood of drilling a dry hole).

Example:

Assume:
(1) the discounted cash flow value (NPV) to an oil company of a possible discovery is $1.5 Billion
(2) Risk Capital - Dry-hole costs are $100 Million and
(3) Probability of success 20%

Expected value = Reward * SP - Risk capital * (1-SP)
Expected value = $1,500 MM * 0.20 - $100 MM * (0.80)
Expected value = $300 MM - $80 MM
Expected value = $220 MM