CHAPTER 4:

ACCOUNTING SYSTEMS IN PETROLEUM INDUSTRY

This chapter has been divided into three sections in different sides related to the study.

4.1. BACKGROUND ABOUT PETROLEUM INDUSTRY

The researcher will illustrate concisely concepts, and features of the petroleum industry and the organizations of the petroleum producing countries.

4.1.1. Petroleum Concept:

The word petrol is derived from the Latin word, (petro = pockoleum=oil). The crude oil consists of hydrocarbon liquid and fatty materials have odour and differs in colours, green – black, lacteous and yellow. Also has different stickiness and consequently different nature density. Moreover, the hydrocarbon gas materials frame the gas. The liquid (crude oil) and gas (natural gas) materials coexist abreast at the same field, may be unique coexist.

The word petroleum consists of two terms, one Greek term is PETRA, and other term OLEUM is Latin term, pockoleum means rocks oil. In common Arabic language “oil” means petroleum. For the scientific use, the petroleum term indicates the mixture of hydrocarbon; it consists of two components: Carbon and Hydrogen in varied rates. However, International Accounting Standards (IAS) defined petrol as petroleum oil and natural gas. In other words, the petrol consists of oil and natural gas.

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The petroleum exists in the interior of the earth either gas, liquid, or rigid forms, according to the circumstances and to environment, as natural gas, crude oil, asphalt, and another hydrocarbons. The petroleum appeared in oil form or asphalt on surface of earth in different places of world.

The significance of petroleum comes from two maxims:

1. Energy resource.
2. The basic material for many of the chemicals and petrochemical industries.

The petrol is a main component of the developing components and has become a weapon of wealth to the exported countries to use it when needed, in 1980; the petrol covered 45% of the world needs of energy.3

4.1.2. Features of the Oil and Gas Industry:

In the early years of the industry, oil and gas exploration and production took place in relatively low cost on shore sites in the USA and the Persian Gulf area, or the shallow water sites off shore, e.g. Gulf of Mexico. In the last 30 years major reserves have been found and developed in much more hostile environments, including the UK Continental Shelf and Alaska. Activities in these latter environments exhibit several distinctive features:

1. The costs and risks of exploration are high and increase substantially as exploration moves into areas of deep water or more extreme weather conditions, and in this industry there is often a low probability of discovering commercial reserves in any individual location.

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2. The elapsed time between initial exploration, the assessment of whether commercial reserves exist and the bringing of such reserves, if any, into production may be many years, for example, in the UK North Sea exploration and development activities have often taken ten years or more, and even then it may take another twenty or thirty years to produce all the recoverable reserves.

3. There is no necessary correlation between the costs of exploration and development expenditure incurred and the value of the oil and gas reserves discovered as a result of those activities. For example, entities can incur considerable costs and find little, or incur relatively modest costs and discover immense reserves.

4. The major economic value which lies within an entity which undertakes exploration and development for oil and gas will often be found in its underlying, i.e. unextracted, oil and gas reserves which are not recorded in company balance sheets, but which require to be disclosed in a prescribed format - in the UK in quantitative terms but in the USA at a standardised measure of discounted future US $ cashflows. These reserve quantities cannot be measured exactly since their estimation involves some subjective judgement and arbitrary determinations; consequently, reserve disclosures are unaudited.

4.1.3. The Producing Countries Organizations:

The producing countries tried to systematize petroleum production, which strived to face the petroleum companies exploited and decrease their influence on the producing countries economy which they established organizations for those purposes. The researcher will give simple hints about those organizations in producing countries.

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4 www.hmrc.gov.uk/terms/index.
4.1.3.1. Organization of the Petroleum Export Countries (O.P.E.C):

Overplus in the petrol production in the world market conducted to decrease the petrol rates, the petroleum companies working in Middle East which decreased the announced rates in 1958, and repeated that in 1960 which led to economic harms to the producing countries.

OPEC was established in September 1960, to sign of hope for the governments of the oil exporting countries, against the overwhelming power of the oil companies and their sponsoring governments, the oil exporting countries had little or no bargaining power, but they were driven by their conviction that they were excessively exploited\(^5\).

Iraq called to assembly to discuss about the petroleum affairs, attended to the assembly Iraq, Saudi, Kuwait, Iran, and Venezuela. The first founding meeting was at Venezuela.

OPEC enhances emerging the national petroleum companies obey to the produce petroleum countries such as: KNPC in Kuwait in 1960, Petromin in Saudi in 1962, Sonatrach in Algeria in 1963, INOC in Iraq in 1964. The main object of those companies to protect the country’s petroleum wealth and invest the petrol inside the national boundaries of those countries.

The organization objectives\(^6\):

1. Unite the petroleum policies between the members’ countries, and do the best methods to protect their interests, as singles or community.

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2. Reduction of the unreasonable fluctuations and protect the interests of the production countries, warrant specific income, and secure the supply furnishings to the consumers’ countries. The table No 4.1 illustrates the world consumers of energy at the strategic areas in the world from 2010-2015. The world energy consumer expectations increased through the periods as shows in the following table. Consequently this leads the consumer countries to search for substitute energy resources.

Table No 4.1 illustrates the Energy Consumer Expectations at the Strategic Areas of the World during 2010-2015, the Unit = Million of Daily Barrels

<table>
<thead>
<tr>
<th>Area</th>
<th>2010</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>North America</td>
<td>66.0</td>
<td>68.7</td>
</tr>
<tr>
<td>Western Europe</td>
<td>38.9</td>
<td>41.1</td>
</tr>
<tr>
<td>Japan and Australia</td>
<td>17.0</td>
<td>18.0</td>
</tr>
<tr>
<td><strong>The Industrial Western Countries</strong></td>
<td><strong>121.9</strong></td>
<td><strong>127.8</strong></td>
</tr>
<tr>
<td>The Previously Soviet Union</td>
<td>26.4</td>
<td>27.8</td>
</tr>
<tr>
<td>East Europe</td>
<td>8.2</td>
<td>8.9</td>
</tr>
<tr>
<td><strong>The Previously States Socialism</strong></td>
<td><strong>34.6</strong></td>
<td><strong>36.7</strong></td>
</tr>
<tr>
<td>Asian Countries</td>
<td>66.0</td>
<td>78.0</td>
</tr>
<tr>
<td>South and Middle America</td>
<td>12.7</td>
<td>14.8</td>
</tr>
<tr>
<td>Middle East</td>
<td>8.6</td>
<td>9.4</td>
</tr>
<tr>
<td>Africa</td>
<td>7.9</td>
<td>8.7</td>
</tr>
<tr>
<td><strong>Developing Countries</strong></td>
<td><strong>95.2</strong></td>
<td><strong>110.9</strong></td>
</tr>
<tr>
<td><strong>The world total</strong></td>
<td><strong>251.7</strong></td>
<td><strong>275.4</strong></td>
</tr>
</tbody>
</table>

Source: Abdullah, Hussain "The Arabian Oil through the Prospective Future Axial Marks on the Track" Emirates Center for the strategically and researches studies issue 14, ed 1, 1998, P.28.

4.1.3.2. Organization of the Arab Petroleum Exporting Countries (O.A.P.E.C):

Libya, Kuwait, and Saudi take action to create the organization in 1968 and Kuwait selected as the organization center. The organization objectives:

1. Collaboration between the petrol industry members.

2. Specified the tactics and methods to save and ensure the members’ interests.

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3. Ensure reaching the petrol to consumer market by fair and reasonable conditions.

At the beginning of the year 2000, Arabian natural gas reserves were estimated 33700 billion cubic meters, 22.4% of total world reserves⁸.

Arabian Oil reserves were estimated at around 646 billion barrels, 62.5% of total world oil reserves. As illustrates in the table No 4.2.

**Table No 4.2 illustrates the Arab Oil and Gas Reserves Beginning 2000 by Billion Barrels**

<table>
<thead>
<tr>
<th>Country</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>UAE</td>
<td>98.1</td>
</tr>
<tr>
<td>Bahrain</td>
<td>0.15</td>
</tr>
<tr>
<td>Tunisia</td>
<td>0.13</td>
</tr>
<tr>
<td>Algeria</td>
<td>10.04</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>263.5</td>
</tr>
<tr>
<td>Syria</td>
<td>2.5</td>
</tr>
<tr>
<td>Iraq</td>
<td>112.5</td>
</tr>
<tr>
<td>Qatar</td>
<td>4.5</td>
</tr>
<tr>
<td>Kuwait</td>
<td>96.5</td>
</tr>
<tr>
<td>Libya</td>
<td>45</td>
</tr>
<tr>
<td>Egypt</td>
<td>3.7</td>
</tr>
<tr>
<td><strong>Total OAPEC</strong></td>
<td><strong>636.8</strong></td>
</tr>
<tr>
<td>Sudan</td>
<td>0.26</td>
</tr>
<tr>
<td>Oman</td>
<td>5.4</td>
</tr>
<tr>
<td>Yemen</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total Arab countries</strong></td>
<td><strong>646.46</strong></td>
</tr>
<tr>
<td>Rest of the World</td>
<td>387.89</td>
</tr>
<tr>
<td><strong>Total World</strong></td>
<td><strong>1034.35</strong></td>
</tr>
</tbody>
</table>


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4.2. ATTEMPTS TO STANDARDISE PETROLEUM ACCOUNTING:

Oil and gas industry exploration and production face difficulty and unique problems for the accounting profession. The principal asset of an oil and gas producing company is its underground oil and gas reserves. A large amount of money may be spent to find a small quantity of oil and gas or, more likely, no oil or gas at all. On the other hand, a huge reservoir might be found with a relatively small expenditure. In either event, the value of oil and gas discovered by a company has no predictable relationship to the costs of exploration and development. Uncertainty associated with costly exploratory activities in the oil and gas industry gave rise to different accounting practices, especially for unsuccessful exploration and development expenditures.

Numerous alternative accounting practices currently followed by oil and gas producing companies made it necessary for the Financial Accounting Standards Board to establish standards of accounting and reporting for oil and gas producing activities. These standards were set forth in FASB Statement No. 19, Financial Accounting and Reporting by Oil and Gas Producing Companies, which effective for fiscal year beginning after December 15, 1978.

4.2.1. Attempts to Standardise Accounting Principles in USA:

The USA being the leading country of the world in technology and latest research in fields of scientific implementations, USA has taken number of the greatest efforts to standardise accounting principles in the oil and gas industry, where numerous attempts were made by USA organizations. The researcher will go in brief through those attempts in both of the Financial Accounting Standards Board (FASB) and the Securities and Exchange Commission (SEC).
4.2.1.1. Concise Review about (FASB) and (SEC) Attempts:

In December 1977, the Financial Accounting Standards Board (FASB) issued FAS 19 "Financial Accounting and Reporting by Oil and Gas Producing Companies".9

FAS 19 required the use of a prescribed form of the "successful efforts" method of accounting, but it provoked opposition from the smaller oil companies which had been following various versions of "full cost" accounting. More importantly, the Securities and Exchange Commission (SEC) of the USA indicated its intention to develop a prescribed form of full cost accounting acceptable as an alternative for the SEC's reporting purposes to the "successful efforts" accounting required by FAS 19. Before the effective date of 15 December 1978 of FAS 19, the SEC in effect compelled the FASB to amend FAS 19 by the issue of FAS 25, thereby allowing the use of either of the two methods, "successful efforts" and "full cost".10,11

FASB Statement No.19 Financial Accounting and Reporting by Oil and Gas Producing Companies, requires an impairment test of unproved reserves, with a required write off, if current value is below historical cost.

The FASB requires no write-down of proved reserves of oil and gas properties for either successful efforts or full cost companies when their carrying values have been impaired. The SEC, however, requires such a write-down for full cost companies. Specifically, (SEC regulation SX 4-10,1978) says unamortized capitalized costs (less certain adjustments) for each cost center must not exceed the cost ceiling, which is

10www.hmrc.gov.uk/terms/index.
11Al-Jabr, Yahya ; Spear, Nasser Op.Cit.
defined as the present value of future net revenues from estimated production of proved oil and gas reserves (plus certain adjustments)\(^\text{12}\).

One of the problems in accounting for oil and gas companies is that the companies make large expenditures on oil and gas properties whose value is very volatile. Thus, significant changes in oil and gas prices can have a dramatic effect on the value of properties.

One of the tenets of financial reporting described in the FASB’s conceptual framework is to provide investor with useful, relevant, comparable, and unbiased information. The lack of a prescribed ceiling test for successful efforts companies has frequently biased management’s choice of an accounting method in periods of declining oil prices.

Statement No. 69 the FASB does not require companies to write down the value of properties below cost based on the results of the disclosure. In theory, Generally Accepted Accounting Principles require that when an asset becomes impaired – when the historical carrying cost exceeds its appropriate measure of value, the asset should be written down. How to measure the value of an asset or group of assets appropriately is central to the issue of impairment.

The FASB identifies five attributes that could be used to measure evidence of impairment. These are current cost, current market value, net realizable value, present value of future cash flows and the sum of future cash flows\(^\text{13}\).

In 1986, the matter was excited again of the two methods the petroleum companies should be practiced, when Chief Accountant’s Office of the Security Exchange


\(^{13}\)Ibid. P57.
Committee (SEC) recommended the petroleum companies registered in Security Exchange to abandon the full cost method. However, the recommendation had not approved.  

In May 1995, FASB issued the SFAS 121 requires SE firms and other non-oil and gas firms to test whether a long lived asset such as proved oil and gas reserves has been impaired when events or changes in circumstances suggest “the carrying amount of an asset may not be recoverable”. Such events in the oil and gas industry may include significant decreases in oil and gas prices or significant increases in costs. The existence of such events triggers the impairment process under SFAS 121. The impairment process under SFAS 121 starts by requiring SE firms to screen for impairment by comparing the carrying amount of an asset to the undiscounted future net revenue associated with the asset. If the undiscounted future net revenue is less than the carrying amount of the asset, the asset is considered to be impaired and an impairment loss must be recognized.  

In October 2001, the Financial Accounting Standards Board (FASB) issued SFAS 144, “Accounting for the Impairment or Disposal of Long-Lived Assets”. SFAS 144 supersedes SFAS 121. SFAS 144 retains the SFAS 121’s rules for long-lived assets held for use. It also establishes a single accounting model for long-lived assets to be disposed of. SFAS 144 is effective for fiscal years beginning after December 15, 2001.

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14 Abdulmalek Hajar "Oil Accounting, the Principles and Procedures, the Hosting Countries role in Production Sharing Agreements" Dar Alfakr Almoaser, Yemen. 2003, P.141.
16 Ibid.
17 Al-Jabr, Yahya ; Spear, Nasser Op.Cit.
4.2.2. Attempts to Standardise Accounting Principles in UK

The researcher has mentioned attempts taken by USA to standardise petroleum accounting. In the following paragraph, the researcher also, will take a second leading country in the world, the attempts to standardise accounting principles in UK.

BP, Shell, etc, companies established in the 1960s with the first explorations of oil and gas in the North Sea., and in 1965 was the first gas discovery at West Sole with production starting in 1967. In 1969 oil was first discovered at Montrose, followed by discovering of the Forties field in 1970, but the first oil production (from Argyll) did not come ashore till 1975.18

4.2.2.1. Consultative Committee of Accountancy Bodies (CCAB)

The Accounting Standards Committee of the Consultative Committee of Accountancy Bodies (CCAB) issued its first Statement of Standard Accounting Practice (SSAP) in 1971, the UK accounting profession did not issue any guidance to the oil and gas industry until the issue in 1986 of the first Statement of Recommended Practice (SORP)19.

4.2.2.2. Oil Industry Accounting Committee (OIAC):

The Oil Industry Accounting Committee (OIAC) was established in 1984 to develop and promulgate guidance for the UK upstream oil and gas industry with the aim of advancing and maintaining standards of financial accounting and reporting.

The OIAC was authorized, initially, by the Accounting Standards Committee and subsequently by the Accounting Standards Board (ASB) to develop Statements of Recommended Practice (SORP) and Guidance Notes for the preparation of financial

18 www.hmrc.gov.uk/terms/index.
19 Ibid.
statements for shareholders. This arrangement requires OIAC to follow the ASB’s code of practice for the production and issuing of SORP. This code of practice provides a framework to be followed by the OIAC for the development of SORP, but does not entail a detailed examination of the proposed SORP by the ASB. However, a review of limited scope is performed. This SORP has been seen by The Financial Sector and Other Special Industries Committee of the ASB, which has raised no objection to its publication20.

The OIAC issued four SORPs and two guidance notes between 1986 and 1998. In January 2000, following a period of substantial increase in the numbers of Financial Reporting Standards (FRSs), issued by the ASB, OIAC rationalised its previous pronouncements into a single combined SORP, superseding all earlier statements.

The ASB code of practice on the development of SORPs requires, inter alia, that SORP-making bodies keep under review all SORPs for which they are responsible. In particular, the SORPs must comply with new accounting standards as they are introduced and reflect any new developments in the industry on which guidance maybe needed. The new SORP incorporates the FRS 15 Tangible Fixed Assets guidance issued by OIAC in September 2000. It also reflects other changes identified by the ASB, OIAC or its oil and gas industry constituency as appropriate for further guidance.21

21Ibid..
4.2.3. Disclosure:

In this sub-section, the researcher will explain in brief, the disclosure concept, redevelopment and significance.

4.2.3.1. Disclosure Concept:

In general, disclosure term indicates to appear and show the thing, which has been unambiguous and misunderstandable.

The disclosure term coupled with multi characteristics, some authors use the full disclosure, other use the fair disclosure, some authors use the adequate disclosure, because of impossibility to achieve the full practical disclosure, and there is no definite term to fair disclosure possible to measure. The fairness concept is a relatively concept, moreover the disclosure of information by the financial reports unsuitable unless adequate, fair and full.

The empirical studies and induction of the accounting thought confirmed the companies’ management hesitates to increase the accounting extent disclosure without press of controlling authorities, exchanges boards, and financial authorities. In addition, the companies lean to take opposite side of disclosure especially the important information for fear of the competitors’ enterprises and the benefits, which possible to attain by investors, lenders, and other benefited bodies\textsuperscript{22}.

The concept of an adequate disclosure demands a good faith effort by management to keep the users of financial statements informed about company’s operations\textsuperscript{23}.

There is no comprehensive list of the information that should be disclosed in financial statements. The adequacy of disclosure is based on a combination of official rules, tradition, and accountants’ professional judgment. Generally, a company should disclose facts that an intelligent person would consider necessary for the statements to be interpreted properly.

4.2.3.2. Disclosure Development and Significance:

The development of disclosure to meet the information need of users could be traced in sore detail by examining social history since the south Sea Bubble at the beginning of the eighteenth century. The divorce of ownership and management, the joint-stock company, and growth in equity and debt-financing and all-important elements, which were reflected in legislation about disclosure\textsuperscript{24}.

The significance of the accounting disclosure today retraces to the significant of the accounting information function, which aims to provide the information through show and disclosure of activities result by the financial reports for rightness making decision from the investors, lenders and other users, especially with financial and economical effects, that wide spread to world financial markets and corporations working in world financial markets, that guided to maximize the disclosure significance and many interesting bodies as professional societies, world stock exchange managements, and researchers especially interesting to the aspects joined to the hypothesis of the efficient market. The factors guided to increase the disclosure significant\textsuperscript{25}:

\textsuperscript{24}Hindmrich ; et al. “Accounting an introduction” the Macmillan press.Ltd. 1977, p.265.
1. At present, because of divergence and complication of the business environment conducted to difficulties of explanation on all the financial and operational information about the firm in the financial reports in its traditional form, that lead to reappraisal of the financial reports in respect of its content, form, and quantity.

2. Ability of the organized financial markets to assimilate a huge amount of information and reflected in the fast and efficient of the shares and equities prices, which helped to diagnose and know the type and size of information that should be disclosed.

3. The increased significance in the aspects of the economical, sociological, and political helping to organize disclosure functions about the financial information in an illumination of the recent economical theories.

4. Increase the disclosure burdens about the financial reports especially the small and medium size firms or unregistered its equities in exchange market (security exchange market) resulting to increase and complicate the accounting principles in the developed countries.

4.2.3.3. Disclosure in Petroleum Companies:

As the researcher mentioned previously, in July 1977, the Financial Accounting Standards Board (FASB) issued the Exposure Draft (ED), which proposed the elimination of the Full Costing (FC) method. Despite the strong opposition from the companies using the FC method, the FASB essentially retained the accounting standards proposed in the ED by issuing Statement 19.
SFAS No.19 requires firms in the oil and gas industry to disclose supplementary data about their properties. These disclosures supply a relatively rich set of measures that can be used in the valuation of a firm’s Oil and Gas properties. The measures include:

1. Net book value in primary statements as determined by either successful efforts or full costing.
2. The standardized measure of discounted future net cash flows relating to proved reserves.
3. The standardized measure of future net cash flows without a discount factor.
4. The current direct profit margin (current sales price minus direct lifting costs, including windfall profit and severance taxes) multiplied by the quantity of proved reserves.
5. Some estimates of the market value of a unit of proved reserves multiplied by the quantity of proved reserves.

The major reasons of the firms disclosures must go beyond the data in their primary statements appear to have been a perceived inadequacy of historical cost accounting to the purposes of evaluating the oil and gas properties.

The FASB, however, made present value measures the centerpiece of the supplemental disclosures required by SFAS No. 69 (FASB 1982). SFAS No. 69 requires firms to estimate oil and gas asset fair values by discounting at a 10 percent rate of interest the net revenue from estimated future extraction and sale of “proved”

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reserves\textsuperscript{27}. The methods of accounting for oil and gas activities should be disclosed. These disclosures should normally include policies in respect of:

1. Accounting for pre-production costs
2. Amortization of capitalized costs
3. Impairment tests
4. Future decommissioning costs
5. Deferred taxation
6. Turnover and royalties
7. Interest

The method adopted in respect of pre-production costs should be described in sufficient detail to make clear the precise nature of costs, including exchange gains and losses and interests, capitalized or written off and the cost centers adopted. In particular, whether full cost or successful efforts accounting policies have been adopted should be specifically disclosed\textsuperscript{28}.

Where unit-of-production methods are used in calculating charges for depreciation, depletion and amortization or taxation, the reserve categories (proved, probable or possible) and proportions of each category used should be given together with a description of the related cost centers. Similar information should be provided in respect of impairment tests.


\textsuperscript{28}(SORP) Statement of Recommended Practice. Op.Cit.
The method of reflecting changes in estimates should also be disclosed. In relation to deferred taxation, details should be provided explaining the treatment of each of the significant timing or permanent differences.

The treatment of royalties in arriving at reported turnover and oil and gas reserves should be disclosed. Uniform group accounting policies should be used for determining the amounts to be reported in a company’s consolidated accounts, if necessary by adjusting for consolidation the amounts which have been reported by subsidiary undertakings in their own accounts. For example, a company’s consolidated accounts should reflect a consistent definition of commercial reserves and a consistent application of either full cost or successful efforts accounting policies throughout all of the group’s interests, irrespective of the accounting policies of the group company, which holds those interests.
4.2.4. The Social Responsibilities Disclosure in Petroleum Companies:

Because of the great importance of the social and environment responsibilities, the researcher will discuss that in the following points.

4.2.4.1. The Environment Position in Asia:

One of the important studies is entitled “Project Asian Brown Cloud” and a recent release was accompanied by the following comments by the Executive Director of the United Nation (UN) Environmental Program, Klaus Toepfer29:

1. A heavy brown cloud covering South Asia to a depth of three kilometers is disrupting seasonal monsoon weather patterns, damaging agriculture, and risking the lives of hundreds of thousands of people in the region.
2. Initial findings clearly indicate that this growing cocktail of soot, particles, aerosols, and other pollutants are becoming a major environmental hazard for Asia.
3. There are also global implications not least because a pollution parcel like this, which stretches three kms high, can travel half way round the globe in a week.
4. The concerns will intensify over the next 30 years as the population of the Asian region rises to an estimated five billion people.
5. Sulphurdioxide emissions in Asia now are greater than Europe, USA and Canada combined and, by the year 2020, will grow by an amount equal to nearly the current emissions in Europe, USA and Canada while emissions in those areas of the world remain unchanged.

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4.2.4.2. Accounting and Environmental Concerns:

There is now a far greater importance on the environmental issues of extracting industries, in increased awareness of the need to display and obligate to environmental issues.

Accounting has an influential role in disclosing about environmental responsibility for different entities whether industrial, commercial, service, or even voluntary and at all levels. Thus, accounting became concerned with achieving new goals such as measuring and evaluating potential or actual environmental impacts of projects and organizations. Accounting is moving rapidly now towards a consideration of social welfare objectives. Accordingly, the purpose of accounting may be stated as to provide information, which is potentially useful for making economic decisions and which, if provided, will enhance social welfare.\(^{30}\)

(Hamid, 2002)\(^{31}\) in his study on the Environment Accounting in the Egyptian Petroleum Sector, specified 18 main reasons of accounting’s interest in the environment.

No doubt, that measuring environmental performance depends on accounting systems but needs more data, other than the conventional accounting data, such as pollution ratios. Economists and accountants have to give best estimates according to the current level of knowledge.


4.2.4.3. Environmental and Social Disclosures

It is worth appreciating effort and responsibility on the part of private sector that is taking a step forward to protect environment for the sake of social welfare. Here such environmental and social disclosures’ are being discussed.

Throughout the world, the private sector is taking over from government an increasing proportion of responsibility for environmental and social investment. Environmental and social responsibilities may be imposed on enterprises by law or may be adopted voluntarily. About 2,000 of the world’s largest enterprises have signed the International Chamber of Commerce’s “business charter for sustainable development” by which the enterprises commit to undertake certain environmental and social responsibilities.

Some extractive industries enterprises include comprehensive disclosures about their environmental and social responsibilities, investments, and results in their annual reports or in special reports – partly in narrative form, partly quantified in financial terms, and partly quantified in no financial measures. These environmental and social disclosures, combined with the more traditional financial reporting, have come to be known as triple bottom line reporting. Examples of the kinds of environmental and social disclosures that are being made are:

1. Compliance with environmental and social legislation;
2. Levels of pollutant emissions;
3. Qualitative social indicators;

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4. Quantitative ecoefficiency measures such as energy consumption waste reduction, recycling, marketing of by-products, and materials use;

5. Strategies for conservation, for development of environmentally superior products, and for meeting future global energy needs;

6. Investment in zero-emissions fuels and renewable forms of energy;

7. Quantitative data about employee health;

8. Environmental protection policies;

9. Employment policies;

10. Social policies.

The American Accounting Association (AAA) issued report of the committee on accounting for social performance, demanded the organizations to disclose accounting information in its financial reports relating to its social contribution and pollution strive.

France obligated the organizations to disclose the information relating to its social responsibility in its external reports.

In September 1999, the Directorate General XV of the European Commission issued for public comment a draft of a Commission Recommendation concerning recognition, measurement, and disclosure of environmental issues in financial statements.

Based primarily on IAS 36, IAS 37, and IAS 38, that draft recommendation deals with recognition, measurement, and disclosure of environmental expenditures, environmental liabilities, and risks and assets related that arise from transactions and events that affect or are likely to affect the financial position and results of the reporting enterprise.

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The Recommendation, also, identifies the type of environmental information that is appropriate to be disclosed in the annual financial statements with regard to the company’s attitude towards the environment and the enterprise’s environmental performance, to the extent that they may have consequences for the financial health of the company.

4.2.4.4. Environmental Reporting

Environmental reporting consists of two main functions as far as reporting of environmental performance is concerned, viz, by physical and monetary units. This performance helps to refine and develop financial audit.

As the process becomes more common, the techniques for measuring these often hidden costs will become more refined and could therefore be developed to form part of the financial audit. International guidelines for public environmental reports have existed since the early 1990s, with some governments now insisting on public ‘green’ accounts and mandatory reporting.

In preparing this environmental accounting report, companies should make an effort to determine both the costs and benefits of efforts to protect the environment, keeping in mind the unique characteristics of the petroleum industry. One characteristic is that substances causing environmental impacts are generated by combustion when customers use the product.

For example, the Cosmo Oil Co. has been made huge investments over many years to mitigate environmental impacts, because the company produces petroleum products

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34 PricewaterhouseCoopers “Financial Reporting in the Mining Industry for the 21st Century”
from Middle East crude oil, which is high in sulfur content. In addition, the company prepared Environmental accounting reports separately\textsuperscript{35}.

The production volume has increased, the environmental burden of products also increased. Environmental productivity improved in the business area, but declined in the product area, with the outcome being a net decline. A major reason for this was that, while the sulfur content of products declined, the proportion of heavy fuel oil C\textsubscript{10} production (which has high CO\textsubscript{2} emissions per unit) increased due to an increase in demand for this fuel for electricity generation\textsuperscript{36}.

\textsuperscript{35}www.cosmo-oil.co.jp/eng/envi/2003/index.html
\textsuperscript{36}Ibid.
4.3. ACCOUNTING METHODS IN PETROLEUM COMPANIES:

In this section, the researcher will pursue in brief the petroleum companies’ history and petroleum production sharing, before discussion the accounting petroleum methods.

4.3.1. Hint about Petroleum Companies:

The petroleum companies were born in 1859 with discovering the first petroleum wells at Pennsylvania State, USA; the American companies hold the world petroleum markets because the United State of America was the first country produced and consumed the petrol in the world\textsuperscript{37}.

The history of oil exploration and exploitation in all of the OPEC and OAPEC countries was originally associated with either foreign occupation or some kind of foreign protection, intervention, or influence. Foreign oil companies and their powerful governments quickly spread their influence in the Middle East and North Africa in search of economic fortunes, strategic advantages, and political power. Oil was their chief target. From oil and geography, the colonial powers gained what they sought in the Arab world following the collapse of the Ottoman Empire\textsuperscript{38}.

This was a transitional period during which the governments of oil – exporting countries were able to prepare themselves to assume full responsibility for the management of their oil industries.

In several OPEC countries, even the management of the upstream operations (exploration and production) had to be entrusted to the former concession-holding companies. Through either management contracts or partnership agreements.

The globalization petroleum companies’ history before 1914 joined with investments the petroleum wealth in Middle East, especially after Iranian leader, granted the petrol exploring concession to the British Petroleum Group, and discovered important petrol fields in 1908.

After that new petroleum group, i.e. France petroleum group entered Middle East in 1920, which established France Petroleum Company in 1924, occupies the eighth rank between the seven great petroleum companies in the world: Standard Oil, Mobil, Standard Oil of California, Gulf, Texaco, Anglo Persian, and Shell.³⁹

The oil and petrochemicals leading companies, which are the largest seven companies known as ‘Seven Sisters’ had each developed into large scale internationally vertically integrated organizations, partially based on foreign direct leading companies had effectively become Transnational Corporations (TNCs) by the beginning of the 1960s, some two decades before many globalization theorists believe TNCs developed more generally. By this time, most of the Seven Sisters were economically larger than many of the nations in which their operations were based, and they had grown both in self-confidence and in their disdain for the desires and policies of national governments. They had played opposite roles against the local governments to achieve maximum profits, were effectively not accountable to many national regulatory bodies, and at this time there were no effective transnational regulatory authorities which could hold them to account. Their home governments granted them many privileges (including beneficial tax regulations) as they contributed vast amounts to the balance of payments, and were an effective tool in some sensitive areas of foreign policy. Five of the Seven

Sisters were US based, one was British (BP), and one was Anglo-Dutch. That company was called The Royal Dutch/Shell Group (hereafter: Shell) which had, since the 1940s, been the second largest of the Seven Sisters.  

4.3.2. Petroleum Production Sharing:

Petroleum production sharing depends on the producing countries or its national companies with the foreign company for exploring and utilizing the petrol, the partnership between them is equally in obligations and rights, and the host country has two peculiarities, the partner and the contract granted.  

The sharing contracts traced before the exploration of the petrol in commercial quantities in Arab East, which mentioned in San Remo in 1920, should give a chance to the producing countries to have a percentage in the foreign companies’ capital no more than 25% of the company shares.  

The petroleum production-sharing concept means the sharing in different petroleum operations, whether the sharing in the first stage in management or in management and marketing, but the foreign companies burden the financial responsibilities. Until explore the petroleum or the partnership in the specific stage of the production stages extents to the downstream (sell and delivery).  

In 2000 International Accounting Standards Committee (IASC) issued “Summary of Issues: Extractive Industries” and defined Production-sharing contract is a contract between a national oil company of a host country and a contracting enterprise to carry

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out oil and gas exploration and production activities in accordance with the terms of the contract, with the two parties sharing mineral output\textsuperscript{42}.

According to these agreements, the producing countries have given the right to contribute in the capital of petroleum companies. Sharing agreements has become a new kind of petroleum agreements, which part of the petroleum return its property to the host country and the concession part return its property to companies. The host countries became able to sell that part in the world petroleum market. The national companies of the members’ countries in OPEC play an important role in the world arena.

The Accounting Standards Board (ASB) London, by the Oil Industry Accounting Committee (OIAC) issued The Statement of Recommended Practice Accounting for Oil in 2000 and updated in June 2001, specified the production contract as follow\textsuperscript{43}:

1. Production Sharing Contracts (PSCs) are generally between oil companies and the governments (or national oil companies) of oil producing countries. Typically, the contractor (the Oil Company or group of oil companies) agrees to pay and bear the risk of all exploration, development, and production costs, in respect of the contract area. If there is production, the contractor receives a share of the production for recovery of its costs ‘cost oil’. The remainder of the production ‘profit oil’ is shared between the contractor and the government in agreed ratios, the share of the profit oil taken by the government representing a form of taxation.

2. In some PSCs the government (or national oil company) not only receives a share of production as a form of taxation but will also be a participant. As participant, it will pay

\textsuperscript{42}International Accounting Standards Committee (IASC). Op.Cit. p.373.
\textsuperscript{43}(SORP) Statement of Recommended Practice .Op.Cit.
its share of costs (or be carried by the other participants) and will receive its participant share of oil cost and oil profit. Each arrangement tends to be unique and requires careful analysis in order to determine the most appropriate way to account for any carried interest.

3. The commercial effect is generally that the contractor enters into such arrangements not as a ‘banker’ but primarily to gain access to additional future production. If there are any carried costs under the PSC terms, they would form an integral part of the overall project investment. Similarly, the contractor's anticipated production revenues, from both the “cost oil” and the “profit oil” elements, are combined in their evaluation of the project economics. It follows that the reporting company, in accounting for the PSC transactions, would draw no distinction between the costs attributable to its own share of production and those attributable to the share taken by the government.

4. The following principles may therefore be appropriate in accounting for production sharing contracts:

A) The oil company’s turnover and cost of sales should include revenues and operating costs associated with the oil company's interest including any cost oil and the government interest as appropriate.

B) Unit-of-production calculations should include the expenditures, oil and gas reserves and production associated with the company’s interest including any cost oil. Capitalized costs related to any carry of the government interest should be amortized over the life of the field as a whole, rather than just over the period during which “cost oil” reimbursement occurs.
4.3.3. Historical Cost Concepts of Accounting for Upstream Activities:

Companies often discover oil and gas assets with substantial value at relatively nominal cost, so the cost of obtaining these assets is often not a fair measure of the value obtained at the time of acquisition. Critics argue that this violation of the fundamental premise underlying historical cost accounting renders historical cost inappropriate.

Because of this limitation, the SEC in 1978 sought to replace historical cost accounting for oil and gas activities with reserve recognition accounting (SEC 1978) based on present value rather than historical cost asset measurement. The SEC, facing rigid opposition based on concerns that the present value measure lacked reliability, eventually abandoned the proposal (SEC 1981).44

The term concept is used in “Issues Paper Extractive Industries” an Issues Paper issued for comment by the IASC Steering Committee on Extractive Industries, November 2000, because a variety of methods for implementing each concept is found in practice.

Nevertheless, the researcher will use both terms i.e. concept or method, because method is a popular name between accountants in petroleum accounting, and majority of authors have used method term. The four accounting methods are:

4.3.3.1. Successful Efforts Accounting:

Used by most large petroleum enterprises and many small ones, and by some mining enterprises. Under successful efforts concept, upstream costs that lead to finding, acquiring, and developing mineral reserves are capitalized, costs that do not lead

directly to finding, acquiring, and developing mineral reserves are charged to expense, and costs whose outcome is unknown may be capitalized or expensed. In addition, a number of different methods of applying this concept have developed, so there is no single successful efforts “method” of accounting. While the same is true for the area-of-interest and full cost concepts, the variety of alternatives is somewhat less for those concepts than for successful efforts.\textsuperscript{45}

The successful efforts method, like the area-of-interest method, the successful efforts method bases the cost center on the mineral resource. The difference is that, while the area-of-interest method uses a full-cost approach to the resource, the successful efforts method expenses any costs that are not directly related to the mineral resource, e.g. the costs of drilling activity that does not find any resources, and all costs incurred before discovery.\textsuperscript{46}

4.3.3.2. Area-of-Interest Accounting:

The ‘area-of-interest’ method is the most commonly used way to account for costs. Other less commonly used methods include the ‘successful efforts’ and ‘full-cost’ methods.\textsuperscript{47}

Area of interest used by many mining enterprises and some petroleum enterprises. Under the area-of-interest concept, costs are accumulated for individual geological areas that have characteristics conducive to containing a mineral deposit toward which exploration efforts are directed. If the area of interest is found to contain commercial reserves, the accumulated costs are capitalized. If the area is found not to contain

\textsuperscript{46}PricewaterhouseCoopers . Op.Cit.
\textsuperscript{47}Ibid.
commercial reserves, the accumulated costs are charged to expense. Mining enterprises often use an accounting approach that is a hybrid between area-of-interest accounting and successful efforts accounting, charging all prospecting and exploration costs to expense up to the point that commercial reserves are found in an area of interest and capitalizing such costs after that point\textsuperscript{48}. During exploration, you may not be able to allocate costs to specific mineral resources, and may use just one cost center. If other distinct mineral resources are later identified, or the area of interest is reduced, you will probably want to create a separate cost center for each mineral resource or area.

If you have accumulated all costs into one cost center, and distinct areas of interest are determined, you may have to allocate the costs already accumulated between the various cost centers on some equitable basis. The most common ways to do this are by using anticipated tonnages or future value of the saleable products.

The timing of later discoveries may change the allocation, particularly if the earlier costs are not relevant to the new mineral resource, or the viability of the resource is established only after significant changes in market conditions. In this case, it may not be appropriate to allocate the costs of exploration or evaluation to the new area of interest.

4.3.3.3. Full Cost Accounting:

The full-cost method includes all costs attributable to the cost center, but does not use a separate cost center based on a particular mineral resource. Instead, it uses a much larger geographical area (such as a whole country or continent) as its cost center.

Full cost accounting used by many mid-size to small petroleum enterprises, but rarely by mining enterprises. Under the full cost accounting concept, all costs incurred in

searching for acquiring and developing mineral reserves in a large cost center such as a
country or group of countries are capitalized, even though a specific cost in a cost center
may have resulted from an effort that was clearly a failure\textsuperscript{49}.

**4.3.3.4. Appropriation Accounting:**

Used primarily by some mining enterprises in South Africa. Costs are capitalized
under rules similar to those under successful efforts accounting. However, no
depreciation is recorded on capitalized costs, on the basis that mines have a finite life,
so that the retention of funds to finance the replacement of the mining facility is
unnecessary and ongoing capital expenditures to maintain existing production capacity
are charged to expense. This method was designed primarily for enterprises with only
one mine.\textsuperscript{50}

**4.3.4. Accounting for Income Taxes:**

The Accounting Principles Board APB Opinion No.11 in December 1967,
Accounting for Income Tax supersedes by SFAS No.96 in December 1987, the
Statement No. 109, supersedes Statement No. 96, Accounting for Income Taxes.

In this part, the basic principles of the FASB statement No.109 will be mentioned.
Further, accounting for income accounting methods e.g. successful efforts, full cost
methods will be explained during tax paying. In addition, a figure to illustrate these
methods will be added for comparative study.

**4.3.4.1. Objectives of Accounting for Income Taxes:**

The objectives of accounting for income taxes are to recognize (a) the amount of
taxes payable or refundable for the current year and (b) deferred tax liabilities and assets


\textsuperscript{50}Ibid.
for the future tax consequences of events that have been recognized in an enterprise's financial statements or tax returns.

The following basic principles are applied in accounting for income taxes at the date of the financial statements:\(^5\)

1. A current tax liability or asset is recognized for the estimated taxes payable or refundable on tax returns for the current year.
2. A deferred tax liability or asset is recognized for the estimated future tax effects attributable to temporary differences and carry forwards.
3. The measurement of current and deferred tax liabilities and assets is based on provisions of the enacted tax law; the effects of future changes in tax laws or rates are not anticipated.
4. The measurement of deferred tax assets is reduced, if necessary, by the amount of any tax benefits that based on available evidence, are not expected to be realized.

**4.3.4.2. Accounting Methods during Taxpayer**

When auditing, a taxpayer in the oil and gas industry, it is important to determine the method of accounting used for book and tax purposes. An individual landowner/lessor usually uses the cash method of accounting for income and expenses. The working interest owner/lessee will use either the cash or accrual method. In conjunction with either method, the taxpayer may also use any of extracting industry methods of accounting for financial statement purposes. The researcher here will discuss in brief, the popular use methods. i.e. Successful Efforts (SE) Method, and Full Cost (FC) Method.

1. Successful Efforts (SE) Method

The Financial Accounting Standards Board (FASB) has issued FASB Statement No. 19 dealing with the successful efforts method. The various types of costs are treated under the SE method as follows:\(^{52}\):

1. Acquisition Costs: They are capitalized to unproven property until proved reserves are found or until the property is abandoned or impaired (a partial abandonment). If adequate reserves are discovered, the property is reclassified from unproven property to proven property. For tax purposes, acquisition costs are handled the same way except the cost cannot be partially written off as an impairment expense. The property must be abandoned before any cost maybe written off.

2. Exploration Costs: They are recorded in two different ways, depending upon the type of costs incurred:
   1. No drilling Costs; the examples of these type of costs are geological and geophysical (G & G) costs, costs of carrying and retaining undeveloped properties, and dry hole and bottom hole contributions. These types of costs are expensed as they are incurred. For tax purposes, no drilling costs are capitalized to the applicable property.
   2. Drilling Costs: the drilling costs are treated differently depending on whether the well drilled is classified as an exploratory well or a developmental well. An exploratory well is a well drilled in an unproven area. A developmental well is a well drilled to produce from a proven reservoir:

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\(^{52}\)Market Segment Specialization Program (MSSP), oil and gas industry, Department of the Treasury Internal Revenue Service, Training 3148-125(5/96) TPDS No.842212C,USA.
1) If an exploratory well is a dry hole, the costs incurred in drilling the well are expensed. If the exploratory well is successful, the costs incurred in drilling the well are capitalized to wells and related equipment and facilities.

2) The costs incurred in drilling developmental wells are capitalized to related equipment and facilities even if a dry hole is drilled. For tax purposes, there is no distinction made between exploratory and developmental wells. Intangible Drilling Costs (IDC) for either type of well are capitalized unless an election is made to expense them. It should be noted that only domestic IDC can be expensed.

Foreign IDC is capitalized and amortized over a 10-year period. Integrated oil companies which elect to expense domestic IDC may only expense 70 percent of the IDC incurred. The remaining domestic IDC, 30 percent, must be capitalized and amortized over a 5-year period. Dry hole costs for either type of well may be expensed unless the taxpayer capitalizes IDC.

The costs associated with tangible well equipment and facilities are capitalized, regardless of the type of well drilled. For tax purposes, certain costs associated with such equipment are eligible for treatment as deductible IDC. Tax depreciation methods usually allow a more accelerated rate of depreciation than book or financial depreciation. Also, book depreciation will be computed on the developmental dry holes and IDC which are capitalized for book purposes but expensed for tax purposes.

3. Production Costs: These costs are expensed as incurred, which is the same treatment used for tax purposes. It should be noted, however, that many taxpayers erroneously expense overhead attributable to either acquisition or exploration activities as
production costs. Overhead attributable to acquisition and exploration costs must be capitalized.

4. Depletion: the cost depletion formula is the same for book and tax purposes, the amount for the basis used in the computation of cost depletion will vary due to the difference in capitalization. In addition, many taxpayers will be allowed to use a larger percentage depletion deduction.

2. Full Cost (FC) Method

Under the FC method, all costs incurred in exploring, acquiring, and developing oil and gas reserves in a cost center are capitalized.

1. Geological and geophysical (G & G) studies, successful and unsuccessful, are capitalized for book and financial purposes. For tax purposes, successful G & G costs are capitalized and unsuccessful G & G costs are expensed. An M-1 adjustment is required for the amount of unsuccessful G & G costs expensed.

2. Delay rental costs are capitalized for book and financial purposes.

3. Exploratory dry hole costs are capitalized for book and financial purposes. For tax purposes, all dry hole costs (exploratory or developmental) are capitalized unless the taxpayer elects to expense them.

4. Impaired or abandoned property costs remain capitalized in the cost center for book and financial purposes. For tax purposes, no deduction is allowed unless a property is totally worthless.

5. General and administrative costs which are not associated with acquisition, exploration, and development activities are expensed. However, overhead that can be associated with acquisition, exploration, and development activities is capitalized. The
costs are handled the same way for tax purposes\textsuperscript{53}. The table No 4.3 provides a comparison of the Successful Efforts, Full Cost, and Tax.

**Table No 4.3 illustrates a Comparison of the Successful Efforts, Full Cost, and Tax**

<table>
<thead>
<tr>
<th>Types of Cost</th>
<th>SE</th>
<th>FC</th>
<th>Tax</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geological and Geophysical</td>
<td>E</td>
<td>C</td>
<td>C (Successful)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>E ( Unsuccessful)</td>
</tr>
<tr>
<td>Acquisition</td>
<td>C</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>Exploratory Dry Hole</td>
<td>E</td>
<td>C</td>
<td>E</td>
</tr>
<tr>
<td>Exploratory Well, Successful</td>
<td>C</td>
<td>C</td>
<td>E*</td>
</tr>
<tr>
<td>Developmental Dry Hole</td>
<td>C</td>
<td>C</td>
<td>E</td>
</tr>
<tr>
<td>Developmental Well, Successful</td>
<td>C</td>
<td>C</td>
<td>E*</td>
</tr>
<tr>
<td>Production</td>
<td>E</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>Amortization Cost Center</td>
<td>**</td>
<td>***</td>
<td>**</td>
</tr>
</tbody>
</table>

Note: E = Expense and C = Capitalize
* - Taxpayers may elect to expense IDC. Although IDC is capital in nature, most taxpayers elect to expense IDC. The tangible portion is capitalized and depreciated. The typical well is usually two-thirds IDC and one-third tangible well equipment and facilities.
** - Property, Field, or Reservoir
*** - Country


\textsuperscript{53} Market Segment Specialization Program (MSSP). Op.Cit.