# STRATEGY IN ENVIRONMENTS OF HIGH UNCERTAINTY: THE EXAMPLE OF IRAN'S OIL AND GAS INDUSTRY

**by**

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# Abstract

This paper is intended as an analysis of strategy implications when operating in an environment of Level Four Uncertainty as defined by Courtney *et al* (1997) in "Strategy Under Uncertainty". Specifically, it examines the Oil and Gas Industry in Iran as an example of such an environment, and the consequences to strategic planning this has for International Oil Companies (IOCs) wishing to enter the Iranian market.

The paper will begin with a discussion of the literature on strategic planning under high levels of uncertainty, and the options available to managers. It continues with an overview of the Oil and Gas Industry in Iran in its current state, and the factors which make this a level four uncertainty environment. The paper will conclude with an application of relevant solutions suggested by Courtney *et al* (1997) for scenario planning for International Oil Companies in Iran.



**Keywords:** Iran; Oil Industry; Strategy; High Uncertainty; Four Levels of Uncertainty; Scenario Planning; Scenario models.

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# Glossary

| | |
|---|---|
| **Barrel** | Unit of measurement for oil. One barrel equals 42 US Gallons |
| **bcm** | Billion Cubic Meters |
| **Downstream** | Refining, petroleum product distribution, retail |
| **IOC** | International Oil Company |
| **NOC** | National Oil Company |
| **Shia** | Second largest Muslim denomination, after Sunni Islam |
| **Upstream** | Exploration, recovery and production of crude oil and natural gas |

# 1: Strategic Planning under High Uncertainty

In their 1997 article "Strategy Under Uncertainty", Courtney, Kirkland and Viguerie outline a differentiation of uncertainty as a key factor for strategic planning. They target the pervasive problem posed by a binary view of the future: either certain, and thus easily and meticulously to be planned for, or completely uncertain, forcing the manager to rely on the less-than-scientific method of 'gut instinct' or become afflicted with decision paralysis. Either way, not realising the degree of uncertainty involved can lead managers to miss both key threats and opportunities posed by their environment, thus resulting in a less than optimal strategy. Courtney *et al*'s framework is based on four levels, each of which comes with a set of analytical tools and recommendations for strategic planning methods best suited to that particular environment. The four levels are as follows:

- **Level One: A Clear-Enough Future**

  One very likely future is forecast with enough precision to make uncertainty irrelevant to strategic decisions

- **Level Two: Alternate Futures**

  A small number of discreet scenarios can be identified; which one will occur cannot be identified with accuracy

- **Level Three: A Range of Futures**

A range of possible futures exists which depend on a number of variables; eventual outcome lies on a continuum within that range

- **Level Four: True Ambiguity**

Multiple factors (not all of which may be identifiable) interact within an entirely unpredictable environment - a range of outcomes cannot be identified

(Courtney *et al,* 1997)

Level Four Uncertainty differs from the other three in more than just the degree of uncertainty the manager faces. It is unique in that it is frequently transitory, eventually stabilising to a somewhat more evenly predictable environment. Company success in such an environment consequently depends on a high degree of flexibility, as well as the ability to identify trends and their implications very early on. An environment with this degree of uncertainty is also quite rare (the example cited is of post-Communist Russia in the early 1990s), making it all the more difficult to recognize the fundamentally different strategy implications to be found here. None-the-less, when it does occur, as with Russia, it can present a great deal of opportunity (as well as cause global turbulence or at least confusion), thus not automatically making it an undesirable environment for a multi-national company seeking to expand into new markets. This is certainly the case for the Oil and Gas sector in Iran in the aftermath of the election on June 12th, 2009, to be discussed below. The long-term opportunity especially for natural gas recovery here is too great for the generally risk-friendly IOCs (International Oil and Gas Companies such as Royal Dutch Shell, BP, and Elf Total) to ignore, in spite of the significant barriers and limitations currently in place.

## 1.1 Postures and Actions

Identifying the level of uncertainty (as well as the relevant internal factors of the company in question and the consequences drawn from this combination) will then ideally lead to decisions on the strategic posture the company should take, and the kinds of actions used to implement them. Postures outlined by Courtney *et al* (1997) are *shaping*, wherein the company actively takes on a leadership role in defining industry operations; *adapting*, where industry structure and development are taken as given but companies gain advantage through flexibility and speedy reactions to market opportunities; and *reserving the right to play*, where a range of investments are made, allowing the company to postpone creating a definitive strategy until there is more certainty about the environment. Actions available to companies range from Big Bets (focused strategies which will either yield major payoffs or losses) over Options (which may bring major payoffs in best-case scenarios while limiting loss for less favourable outcomes) to No-Regrets moves (which may have positive payoffs under any scenario). These choices are not made, however, until the environment has been analysed according to the level of uncertainty, and combined with an internal analysis of the individual company.

## 1.2 Analysing Level Four Uncertainty

Since a Level Four environment frequently lacks the option of even identifying the variables that will influence the possible outcomes, more conventional tools for strategic analysis, such as Porter's Five Forces, are of little use. Instead, Courtney *et al* (1997) propose a range of methods allowing for a more comprehensive approach. The

most relevant for the Oil and Gas Industry of Iran is Scenario Planning, but the list also includes Game Theory, System Dynamics, and Real Options and Agent-based models.

### 1.2.1 Real Options and Agent-Based Models

Real Options valuation models, according to Courtney *et al* (1997), are used to correctly value a company's investments (and thus go beyond the scope of this paper). Agent-based computer simulation models as presented by Casti (1997) may be used to study uncertain, complex systems such as the stock market or geopolitical environment by creating 'artificial worlds' in computer models. Though some scenario planning literature (van der Heijden, 1996) also suggests the use of computer models at later stages of analysis, Casti's models too go beyond the scope of this paper.

### 1.2.2 Systems Dynamics

Game theory and Systems dynamics both supplement scenario analysis well when analysing a Level Four Uncertainty environment. As shown by Arie De Geus'(1988) early article on "Planning as Learning", system dynamics may work as a natural extension/complement of scenario planning in helping to understand complex market interactions (Courtney *et al* 1997). Based on the example of Royal Dutch Shell and the incorporation of strategic scenario planning into corporate culture, De Geus (1988) shows how scenario planning will aid institutional learning and allow a company to operate more successfully in an environment of high uncertainty.

Based on the argument that strategic success depends on decision makers' ability to absorb and correctly identify what is happening in the business environment, De Geus (1988) states that use of scenario planning and mental models will facilitate learning,

which in turn will lead to better ability in this area. His main criticism of institutional learning in general is that it is most often linked to crisis management, and therefore ineffectual. Successful companies (where success is measured in longevity, i.e. the ability to survive uncertain times) "recognize and react to environmental change before the pain of a crisis" (De Geus, 1988, p.71). Scenario planning is stated to be an efficient method for achieving this, though making the approach part of company culture is in itself a leaning process. The approach needs to become part of the "mental model of business" (De Geus, 1988, p.71) for key decision-makers before it can be a successful element of the whole company's culture, and it does so through the steps of "hearing, digesting, confirmation, action" (De Geus, 1988, p.71). This is the case both when managers are learning to use scenario planning, and later for the acceptance of different scenarios created for various projects.

### 1.2.3 Game Theory

Game Theory completes the list of tools which may supplement scenario planning. In "The Right Game", in what may be interpreted as definite encouragement for shaper strategy as outlined by Courtney, Brandenburger and Nalebuff state that "successful business strategy is about actively shaping the game you play, not just playing the game you find" (Brandenburger and Nalebuff, 1995, p.58). Courtney *et al* suggest the use of game theory to help "understand uncertainties based on competitors' conduct" (Courtney *et al, 1997,* p.182). Given the impossibility of prediction in a Level Four Uncertainty environment, Game Theory has limited use in strategic planning. This is true at least for an environment such as Iran in its current state, where more is dependent on the political situation than on immediate actions by competitors, who have

equally limited power to change the rules within the state-monopolized environment. Analysing environment and competitors according to the 'rules-based game' described by Brandenburger and Nalebuff, where it is implied one must have the ability to predict the future with a degree of certainty, or "look forward far into the game" (Brandenburger & Nalebuff, 1995, p. 58), according to the 'rules of engagement' (which, in Iran today, may change overnight) thus appears largely futile.

Given the global outlook of IOC giants such as Shell or Total, of course, there is still room within the analysis of key players for the search for cooperative/competitive options for changing the game, as outlined by Brandenburger and Nalebuff (1995, p.58, 60). Within the context of creating scenarios, of course, there is room for game theory.

### 1.2.4 Scenario Planning

#### 1.2.4.1 Overview

Scenario planning, as defined by Schoemaker (1995), is "a disciplined method for imagining possible futures" (Schoemaker, 1995, p.25). A business environment is analysed according to a number of factors such as economic and political issues, key players and major uncertainties. Subsequently, a number of 'visions' of the future are constructed accordingly. As a method for dealing with increasingly uncertain environments, it has become progressively more popular not just for dealing with strategies for Emerging Markets. As stated by Keogh and Shanahan (2008), it provides "a systematic yet highly flexible approach that is highly participative" (Keogh & Shanahan, 2008, p.168) – not suited to every organizational culture, but invaluable when dealing with the multitude of unpredictable (or even unknowable) factors frequently presented in developing economies. Much pioneering in this area has been done by Royal Dutch

Shell, which began using this technique in the 1970s, and as a consequence suffered far less during the 1973 oil crisis, and later oil price declines, than did its competitors.

In his frequently cited comprehensive book on the subject, van der Heijden (1996) uses the example of Shell to sum up the central objectives of scenario planning that have emerged. Briefly outlined, these objectives are as follows:

- To generate projects and decisions which are robust for a number of alternative future outcomes
- To lead to better/more substantial thinking about the future
- To allow management to be more perceptive, and recognize events as part of a pattern or trend, thus realizing their implications for the company more quickly
- To set the context in which decisions are made (not just by top management)
- To help management provide leadership on issues affecting the entire organisation

(van der Heijden, 1996)

According to van der Heijden (1996) then, scenario planning is more than a strategic tool. To truly fulfil the objectives exemplified by Shell, it must become a central part of company culture. It can be used when considering individual projects such as entering the Iranian market, or when determining the big-picture strategy for the future course of a company, such as BP's image transformation in the 1990s from 'British

Petroleum', one oil and gas giant amongst many, to a sunflower-logoed New Energy proponent one almost forgets also produces oil.

As with Courtney *et al* (1997), a distinction of the kinds of uncertainty to be found is also made by van der Heijden (1996). His focus, however, is not on classifying the environment, but rather on the scope of uncertainty within the environment the company operates/plans to operate in. van der Heijden (1996) defines it as "the degree to which we can make useful statements about the future"( van der Heijden, 1996, p.83) and distinguishes between *Risks* (where historical precedent allows for parallels to be drawn), *Structural Uncertainties* (where the possible event is so unique as to render any form of likelihood-estimation useless), and *Unknowables* (where even imagining the form of the event is not possible). Scenario planning is most effective when faced with structural uncertainties. Unpredictability of likelihood happens because the patterns which may lead to the event can be variously interpreted (the 'Basic Trends' defined by Shoemaker below), and it is the challenge of scenario planning, according to van der Heijden (1996), in "entirely new and uncharted territory [to work] through the consequences of the different ways the business environment may change" (van der Heijden, 1996, p.84).

Scenario planning, it must be stressed, is not intended as a tool to predict the future, merely as a way to provide guidance and help prepare for a variety of outcomes, allowing managers to take calculated risks. As van der Heijden (1996) states, "the scenarios themselves are not the decision calculus indicating whether or not to go ahead with a project, they are a mechanism for producing information that is relevant to the decision" (van der Heijden, 1996, p.16) – information about what the future may hold. Managers must then decide whether and how to act on it, based on their own opinions

about the future as much as internal capabilities of their company. The concept of calculated risks in the context of scenario planning is especially valid for the oil and gas industry, as the example of Royal Dutch Shell has shown. In an industry where windfall profits can more than make up for a string of unsuccessful projects, a 'Can't win them all' attitude is prevalent (van der Heijden, 1996). Thus, scenario planning allows energy companies to incorporate decisions concerning relatively high levels of risk into the flow of projects, and companies can readily accept the limitations (i.e. non-prediction nature) of scenarios in return for the benefits this method provides the company as a whole.

#### 1.2.4.2 Creating Scenarios

It has been noted (Keogh and Shanahan, 2008) that most models for building scenarios follow a similar framework – a definition of issue and scope of the scenario story, followed by systematic compilation of relevant material regarding stakeholders, trends, constraints and other factors. These are then ranked or categorized in a variety of ways and ultimately used to create a set of scenarios suitable to the company's needs. Shoemaker's 10-Step model is frequently cited (Keogh 2008, Crossan *et al* 2005) and, when combined with van der Heijden's (1996) framework provides a suitable model for this paper. The ten steps suggested by Schoemaker (1995) are as follows:

1. Define the Scope
2. Identify the Major Stakeholders
3. Identify Basic Trends
4. Identify Key Uncertainties
5. Construct Initial Scenario Themes

6. Check for Consistency and Plausibility
7. Develop Learning Scenarios
8. Identify Research Needs
9. Develop Quantitative Models
10. Evolve towards Decision Scenarios

(Schoemaker, 1995, p.28-30)

The first five steps are practically identical to other models (such as Schwartz' 8-Steps and Alvin's 12-Steps, as presented by Keough & Shanahan, 2008), with slight variations in what to do after initial scenarios have been considered. Options include simply providing decision makers with the scenarios to aid further planning, or creating signposts based on the scenarios as early-warning signals of which way events are heading (Keough & Shanahan, 2008).

#### 1.2.4.3 Identifying Basic Trends

One factor of particular importance to the success of the scenario models is identifying basic trends. van der Heijden (1996) focuses on an 'Iceberg' analysis for this, which divides knowledge into visible events, discernable patterns, and hidden structure that must be discovered. Schoemaker (1995) merely suggests examining those "political, economic, societal, technological, legal and industry trends" which are certain to influence the market. This idea is echoed by Walsh (2005), who cites numerous examples of PESTEL analysis (political, economic, social, technological, environmental and legal factors) used in this context. In combination with internal resource analysis and the

resulting scenarios, Walsh maintains, these lead to improved understanding of the link between company performance and changing environment.

### *Iceberg Method*

As mentioned above, the Iceberg model used by van der Heijden (1996) divides knowledge into the categories of events, pattern and structure, of which only events are visible and knowable to the manager. Patterns are the equivalent of Schoemaker's (1995) Basic Trends, and can be understood better by examining the interrelatedness of the trends which form the structure (van der Heijden, 1996). van der Heijden (1996) suggests influence diagrams as a means for gaining detailed understanding about how underlying structure may shape patterns and ultimately events. Much here is obviously subject to individuals' interpretation of significance (see MacKay & McKiernan (2006) criticism of scenario planning discussed below), but is still the best starting point for understanding the causal relationships beneath van der Heijden's (1996) *Structural Uncertainties*.

### *Environmental Analysis Framework*

A variation of PESTEL analysis, perhaps particularly suited to understanding uncertainty in an emerging market context, is provided by Austin (1991) in *Managing in Developing Countries*. In his 'Environmental Analysis Framework' he suggests an analysis of four environmental factors (economic, political, cultural and demographic) within the four levels of business environment: International (interactions between countries), National (government strategy and policy), Industry (a company's competitive

environment), and Company (a company's strategy and operations) (Austin, 1991). Each Environmental Factor can also be divided into sub-categories (see Figure 1), and is linked by causal relationships to the other. Identifying the most relevant factors and relationships (the driving forces) will yield a similar (perhaps more thorough) result to van der Heijden's (1996) influence diagrams.

***Figure 1:*** **Austin's Environmental Factors**

| **Economic** | **Political** |
|---|---|
| Natural Resources<br>Labour<br>Capital<br>Infrastructure<br>Technology | Stability<br>Ideology<br>Institutions<br>Geopolitical Links |
| **Cultural** | **Demographic** |
| Social Structure and Dynamics<br>Human Nature Perspective<br>Time and Space Orientation<br>Religion<br>Gender Roles<br>Language | Population Growth<br>Age Structure<br>Urbanization<br>Migration<br>Health Status |

(Austin 1991, p.32)

Not much guidance is given by any source discussed on how to determine which factors are most significant (i.e. the ranking of trends and issues suggested by Schoemaker 1995). This varies significantly from case to case, and is very much a

question of interpretation by whomever is creating the scenarios – different people and different perspectives will value different criteria.

#### 1.2.4.4 Developing the 'Story'

In terms of the form the scenarios should take, van der Heijden (1996) is quite specific. To truly have an impact, it must go beyond a bare-bones outline of the future and be fleshed out so as to be "provocative, memorable, [and] eliciting a rich imagery" (van der Heijden, 1996, p.213). Essentially, each scenario must provide a plausible link between the known past and the uncertain future, based on interpretations of perceived trends. It must also be kept simple (minor trends and issues can be neglected) yet unified, i.e. focusing on a limited number of factors known or assumed to have a central impact on the future. In Iran, for example, these factors would encompass middle- to long-term outcome of the election, and global oil and gas price and demand. As a final point, van der Heijden (1996) recommends quantifying key variables and listing the leading indicators for the scenario.

Both Schoemaker (1995) and van der Heijden (1996) also make a distinction between the kinds of scenarios which may be constructed, depending on need. Schoemaker (1995) suggests identifying the extreme ends of the key issues (all-positive/all-negative), and combining them to provide a clearer idea of the range of outcomes possible. Alternatively, he proposes 'clustering' scenarios around such factors as high/low continuity from the past or how prepared the company may be to face a certain outcome. van der Heijden (1996) takes his scenario recommendations further, in a bid to tackle the problem of *unknowable* factors. While he thus also has the option of "Surprise-free" scenarios, he also highlights the use that "Challenge"- and "Phantom-

scenarios" (where a seemingly unlikely, even random future is described) have had in the past (van der Heijden, 1996). Royal Dutch Shell's scenario preparation for a steep drop in oil price from US$28 to as low as US$10/barrel in 1986, an event thought almost impossible at the time, serves as an example of the success of scenarios which require the suspension of disbelief to be plausible (De Geus, 1988).

#### 1.2.4.5 Scenario Follow-Up

Few of the scenario planning approaches suggested by relevant literature leave the model with only first generation scenarios, of course. Both van der Heijden (1996) and Schoemaker (1995) (as well as other models reviewed by Walsh 2005) recommend testing the scenarios against a number of criteria and subsequently narrowing them down further. van der Heijden suggests two to four scenarios as adequate for the decision making process further down the line (van der Heijden 1996).

As far as testing for internal consistency goes, van der Heijden (1996) focuses on 'actor-testing' as central to determining a scenario's plausibility. Based on the actor/stakeholder matrix, which distinguishes between 'Subjects', 'Players', 'Crowd' and 'Referees' (van der Heijden, 1996, p.215), key actors of the scenario are identified. The scenario is subsequently examined from these actors' perspective to determine if behaviour is indeed consistent, and the story's logic is valid. Schoemaker's Step Six also demands testing for consistency. He distinguishes three necessary tests, concerned with the trends, outcome combinations, and stakeholder reactions (Schoemaker 1995). According to Schoemaker (1995), the first scenarios provide future boundaries, but after the most strategically relevant themes have been identified, they must evolve. Schoemaker's (1995) criteria for determining if a final scenario is useful, finally are the

factors of relevance (the scenario must be consistent with users' mental maps), internal consistency, and archetype (i.e., the scenarios are not variations of one theme, but portray fundamentally different futures).

#### 1.2.4.6 Criticism

Chermack (2005) points out that, in spite of its ever-increasing popularity, there have been no empirical studies to prove scenario planning's effectiveness. Other criticism of the scenario planning method, however, does not focus on the use of these kinds of models themselves, or on their general effectiveness. Instead, valid criticism can be made about scenario models susceptibility to cognitive bias or cognitive inertia of their creators - essentially people's unwillingness or inability to move away from their usual thought patterns. This places considerable limitations on the range of possibilities a set of given scenarios may explore – it is particularly vulnerable to overlooking weak signals (MacKay & McKiernan, 2006).

MacKay and McKiernan (2006) examine the significance of causal fields in this context. Following Mackie in their definition of causal field -"the context against which factors contributing to a certain effect are deemed causally relevant in the diagnostic process, particularly after experiencing certainty" (MacKay & McKiernan, 2006, p.95) – they highlight the importance of perception of past events when 'rating' trends/events for scenarios. This may be done involuntarily when assessing environmental context even if dealing with what van der Heijden (1996) would term the result of structural uncertainty (i.e. no parallel can be drawn). Awareness of the social construct that is environmental context, and the link to history in what they deem "cues-to-causality" (MacKay &

McKiernan, 2006, p.101) is an important factor in avoiding the pitfalls of overly subjective models.

To demonstrate, the circumstances leading up to the war in Iraq are used as an example (the Neo-conservative think-school of the Bush Administration having been rather prone to allowing their worldview to influence its analysis of international environment and its potential.) Advocates of war in Iraq had deemed Saddam Hussein a threat based (partly) on their knowledge and interpretation of past events. As MacKay and McKiernan state, they "used their knowledge of the past and present to justify their position through the *generation* of an environmental context" (MacKay & McKiernan, 2006, p.101). It should be noted of course that opponents of the war also generated an environmental context, but one invoking an alternate causal field: "Advocates and opponents of war selectively emphasized cues-to-causality that corresponded to their respective biases, while [] deemphasizing or ignoring others" (MacKay & McKiernan, 2006, p.102). To exemplify the context created by the 'Hawks': "They included such facts as Hussein has invaded his neighbours, [he] has gassed his political and racial enemies and tortured and brutalized his own people, the United Nations is proving as ineffectual as the League of Nations was after Poland was invaded, and [Rumsfeld] seems to think that Churchill advocated a 'pre-emptive' war against Hitler" (MacKay & McKiernan, 2006, p.101). To simplify – this reasoning led to a scenario where Iraq and its leader were considered a clear threat, prompting the conflict. Incidentally, one can see potential parallels for this in Iran after the election. In attempts to predict what Iran's political future may look like and what the implications of the election will be, many are identifying current events either with the Islamic Revolution of 1979 (thereby pointing

towards the possibility of a second revolution and new political order in the Islamic Republic), or with the student uprising in Tiananmen Square 1989, which was completely quenched by state authority.

The solution for the problem of cognitive bias offered by MacKay and McKiernan (2006) seems rather simple: beyond aiming for a clearer understanding of how history is constructed (which may not always be practical in the context of private enterprise), combining causal fields from various different viewpoints in order to pre-empt oversimplification and encourage more thorough analysis when constructing scenarios is the most immediate solution. While this may not always be practical (or desirable) with regard to world politics, it can boil down to as simple a solution as having diverse teams when building scenarios within a company.

## 1.3 Conclusion

Scenario analysis, as has been shown, is an effective tool when a company is making strategic decisions about operating in a highly uncertain emerging market environment. The remainder of this paper will consequently be an attempt to apply the principles outlined above to such an environment. It will analyse the situation for the Oil and Gas Industry in Iran. After providing an industry overview, it will follow the first six steps of Schoemaker's (1995) Ten-Step model, incorporating Austin and van der Heijden's (1996) recommendations for environmental analysis into the evaluation of Basic Trends to create a learning scenario. It will conclude with strategic recommendations for a company entering this environment.

# 2: Oil and Gas Industry Overview

## 2.1 Global Industry

### 2.1.1 Overview

The oil industry has been one of the defining industries of the 20th Century. In spite of increased awareness of and action about the environmental impact of fossil fuels, it will in all likelihood continue to play a significant role well into the 21st, as demand for oil and, increasingly natural gas, continues to fuel our lives. Since its beginnings in the United States in the mid-nineteenth century, it has shaped not only the energy industry, but global business as a whole, exemplifying the rise of huge corporations (and conglomerates) with John Rockefeller's Standard Oil (Yergin, 1991). The oil and gas industry today is enormous, and energy and politics, as the most recent war in Iraq has once again shown, are intrinsically linked.

Hundreds of players make up this industry, dealing with all aspects from exploration (upstream) to refining (downstream). Many of the largest players, such as Royal Dutch Shell, BP, or Esso are integrated companies concerned with all aspects of the business. Others (EnCana, for example) handle only individual aspects such as exploration or refining. One of the main distinctions which can be made is between International Oil Companies (IOCs), which are private enterprises, and National Oil Companies, state-run companies with control over their nations often enormous natural resource assets (Petrobras of Brazil and NIOC of Iran are two examples here). Together with national governments, international organisations (such as OPEC), enterprises

involved in various steps along the supply chain, and finally the industries and organization who require oil and its products, IOCs and NOCs form a complex system whose influence on modern life can hardly be underestimated.

### 2.1.2 Forecasts

During the period from 1999 to 2007, global oil demand increased by 12.8 percent, or 9.65 million barrels per day. This slightly exceeded the supply growth (12.7 percent/ 9.16 million barrels/day), which resulted in the great increase in oil prices up to 2008. More than half of the supply increases (5.25 million barrels/day) were met by Russia, the remainder by OPEC member countries. The figures for 2009-2018 are expected to be significantly lower, both in terms of demand and supply. According to Business Monitor International (2009) forecasts, demand is set to increase by only 1.17% annually up to 2013, and 1.42% for 2013-2018. Output expansion is set to be 1.52% per year up to 2013, and only 1.37% annually for 2013-2018. Output growth for OPEC countries, however, is expected to be higher, with annual growth rates of 2.61% up to 2013, and 2.46% between 2013 and 2018. OPEC is thus predicted to maintain its powerful position in the oil and gas market.

Business Monitor International (2009) forecasts for global oil and gas demand in the next ten years show considerable increases in the Middle East and Asia Pacific regions in particular, as well as in Latin America and Eastern Europe. Oil demand in developed countries in North America and Western Europe, on the other hand, is predicted to be stagnant if not actually go down by the year 2018.

The situation is somewhat different for global gas supply and demand. Natural gas is becoming an increasingly popular fuel source worldwide (driven primarily by Asia and the Middle East), and demand has been rising rapidly. Growth rates are expected to remain high (3.87 percent per annum) until 2013, with less dramatic increases of approximately 3 percent between 2013 and 2018 (Business Monitor International 2009). Gas supply will almost certainly mirror demand. Due to the difficulty in storing natural gas, new projects are unlikely to be developed unless there are secure demand deals in place. Natural gas supply is thus expected to increase from 2834 bcm in 2008 to 4076 bcm in 2018. (WoodsMacKenzie, 2008)

According to Business Monitor International's (2009) Oil and Gas Report, excessively low investment levels are currently having an adverse effect on the industry's future. Both international and national oil companies have been forced to decrease spending as a result of the global recession. This is of particular concern given the increased ratio of high-cost investment projects in many companies' portfolios (such as the North Alberta Tar sands projects) – Business Monitor International (2009) expects cancellations or delays here to increase, further lessening the industry's ability to meet oil demand. Additionally, low oil prices continue to be a threat to the industry. Business Monitor Complete (2009) expects that continued low prices in 2009 (under US$50 per barrel) will further decrease companies' ability and willingness to invest, and may actually lead to several companies failing. Given the long-term nature of most oil and gas projects, of course, failure to invest now may well lead to severe supply shortages in the next decade.

Recession effects on oil demand have been severe, and can be expected to continue in the near future. While this has been more the case in developed nations than emerging markets, the repercussions for the oil and gas industry as a whole are none-the-less expected to be strong. Of particular consequence are the automobile industry and related sectors, where developments have a close effect on the oil industry (Business Monitor Complete, 2009). This goes for both the dire state of the American automobile producers as for Japanese and European companies.

## 2.2 Iranian Industry

### 2.2.1 Overview

May 25th, 2008 marked the one hundredth anniversary of oil discovery in Iran, thanks to the persistence of British engineer George Reynolds and the ingenuity of financier William Knox D'Arcy. Their discovery ultimately led to the creation of Anglo-Persian, which would evolve into one of the giants of the oil industry, British Petroleum (Yergin, 1991). Much of Iran's history since 1908 can be directly linked to the industry, and the consequences have rarely been peaceful. Historically, British and American involvement was the strongest amongst the international players - the interplay between the autocratic Shah, CIA and Oil Industry up to the Islamic Revolution are well documented. The heydays of the Iranian Oil Industry were the 1970s, when relations to the West were significantly better than those of most Middle Eastern countries, and most major international oil companies were represented in Iran. With the Islamic Revolution, this changed practically overnight, and nationalisation of the industry forced foreign companies out (at significant loss). Not until the mid-1990s did this change.

The oil and gas industry in Iran today is entirely state-run. As such, it is controlled by the Ministry of Petroleum, one of the most powerful ministries in the Islamic Republic. According to Wood Mackenzie, the Ministry "holds ultimate approval for licensing of oil and gas projects and exerts ultimate management responsibility for all Iranian state companies involved in the industry" (Wood Mackenzie, 2008, p.44). The Ministry of Petroleum was set up in 1981, and has four main subsidiaries: NIOC, NIGC, NIPC, and NIORDC. The Chief Executive Officer of each Ministry of Petroleum subsidiary also holds the title of Undersecretary (to the Minister of Petroleum). Each company in turn has a number of smaller subsidiaries, primarily for geographical division of its industry sector.

Private foreign International Oil Companies (IOCs) or state-run National Oil Companies (NOCs) are permitted into the sector as investors and on a sub-contractor level. The most extensive involvement is currently by the Iranian branches of three of the largest European multi-nationals: Italy's Eni, France's Elf Total, and British-Dutch Royal-Dutch Shell. Increasingly, however, national oil companies of developing countries are showing interest in the Iranian oil and gas industry, in attempts to meet the growing demands of their economies. Predominant here are Russia and China, but India, Thailand, and others have also shown interest or started involvement.

### 2.2.2 Resources

#### 2.2.2.1 Oil

The most recent estimates by Business Monitor International's (2009) Iran Oil and Gas Report (for the Second Quarter 2009) rank Iran's total fossil fuel reserves in the top three worldwide. Iran's total reserves of crude oil make up approximately ten percent

of global reserves. At an estimated total of 136.2 billion barrels as of January 2009, this gives the Islamic Republic of Iran OPEC's second largest reserves, after Saudi Arabia. (Energy Information Administration, 2009).

The greater part of Iran's oil is to be found in onshore fields, primarily in Khuzestan, the south-western part of the country and close to the Iraqi border. There are currently forty oil-producing fields, twenty-seven of which are onshore. Total production capacity was estimated by the Energy Information Administration (2009) as being four million barrels per day, with actual output being 3.88 million barrels/day – compared to 8.45 million barrels/day for Saudi Arabia (the top producer of the region) and 2.87 million barrels/day for the United Arab Emirates (the third largest producer). This is down considerably from peak output before the Islamic revolution: 6.6 million barrels/day in 1976 (Library of Congress, 2008). Compared to the other top producers in the region, Iran's oil fields suffer from an exceedingly low recovery rate of under thirty percent (Library of Congress, 2008). Combined with the natural decline rate of up to thirteen percent (Library of Congress, 2008), there is evidently a great need for modernisation and upgrading in order to maintain or increase oil production. Iran's Ministry of Petroleum stated in 2008 that a minimum of US$500 billion of mostly foreign investment would be needed over the next fifteen years. The ability to obtain this amount in order to maintain and expand the oil and gas sector will be highly dependent on the political situation of the Islamic Republic, as well as the international economic situation and global trends in the industry.

#### 2.2.2.2 Natural Gas

As of January 2009, Iran's estimated natural gas resources amount to 28 000 bcm (Energy Information Administration, 2009). This is approximately fifteen percent of the world total, giving Iran the largest gas resources in the Middle East, second only to Russia in global comparison. Over two thirds of the gas resources have thus far gone untapped, providing tremendous opportunity, especially as the global importance of natural gas is projected to surpass oil in future years.

Iran's gas reserves are primarily offshore. The South Pars field in the Persian Gulf, shared with Qatar, accounts for about forty percent of Iran's total reserves (Energy Information Administration, 2009). Development of the field, however, is moving very slowly, and more involvement of international partners is needed in order to utilize this enormous resource for both the domestic market and export. Several International Oil Companies are currently involved in various Phases of South Pars development, but the combined effect of international sanctions and erratic national policy makes re-investment as well as new investment unpredictable and risky, thus leading to considerable delays in the field's development to date.

### 2.2.3 Infrastructure

The infrastructure for Iran's oil and gas industry is long-established and quite well developed, though like upstream exploration and field development, suffers from aging technology and lack of investment. The first crude oil pipeline, which linked Gachsaran oil field to Abadan refinery, was built in 1909 and had a capacity of under 8000 barrels per day. The pipeline network expanded rapidly over the next few decades, though a significant portion was destroyed during the years of the Iran-Iraq war in the 1980s.

Capacity now exceeds pre-war volume, however. An extensive network consisting of 13,500 km crude oil trunk pipelines is now in place, enough to meet the current crude oil production (Wood Mackenzie 2008). The nine oil refineries have a capacity of over 1.6 billion barrels per day. In addition, there exist five export terminals and three import terminals (the latter located on the coast of the Caspian Sea, in northern Iran). Kharg Island is the largest export terminal, servicing practically all of Iran's onshore oil fields as well as the offshore fields in the northern Persian Gulf. Its capacity currently lies at about four million barrels per day.

Iran's gas infrastructure, especially for the domestic sector, is less well developed. Supply for all major urban areas is covered, and in total the network currently exceeds 44 000km of trunk and local supply lines. The network is dominated by four regional transmission lines, and several new pipelines (linking South Pars to the domestic market) are in planning or currently being constructed (Wood Mackenzie, 2008).

Capacity of existing gas processing facilities is currently one of the major weak points of the developing gas sector, and one of the main reasons for the country's continued need to import much of its gas. A number of gas export pipelines do exist, however.

In terms of infrastructure not directly related to oil and natural gas, Iran has an extensive road and rail network, as well as 331 airports (129 of which have paved runways). The country also has a total of fourteen ports, which shipped 30 million tons of cargo (numbers for 2004) and unloaded 53 million tons (Library of Congress, 2008).

### 2.2.4 Market

#### 2.2.4.1 Domestic Market

According to Energy Information Administration (2009) figures for 2006, Iran's domestic energy consumption breaks down as follows: 53 percent from natural gas (steadily increasing); 45 percent from oil; two percent hydro, and one percent coal. Significantly, even though the country has the second largest reserves of natural gas worldwide, a large portion must be imported to cover domestic needs. Primarily, gas is currently imported from Turkmenistan, though the exact volume is not known.

Energy demand is exceedingly high in Iran, due to aging and inefficient technology and high fuel subsidies, brought about by the country's wealth of natural resources. Gas consumption for 2008 was approximately 119bcm, with forecasts for 2009 peaking at 130bcm, steadily increasing to 167 bcm in 2013. Oil consumption for 2007 was at 1.7 million barrels per day, with the main demand being for gasoline and diesel. BMI projections for 2013 show an increase up to 1.86 million barrels/day. Gasoline products are still mostly imported, due to limitations on refining capacity. Domestic demand for other oil products is slowly being replaced by demand for natural gas, and is thus decreasing.

#### 2.2.4.2 Export

Energy Information Administration (2009) numbers show oil exports of 2.4 million barrels per day of oil, primarily Iranian Heavy Crude as well as Light Crude. Export revenues were US$57 billion, accounting for one third of government revenues. Gas export, though still minimal, is expected to grow rapidly in the next five years, if development of Iran's natural gas resources takes off. Business Monitor International's

(2009) export figures for 2008 lie at only 11bcm, projected to more than double (25bcm) in 2009, and expand to almost 48bcm by 2013.

#### 2.2.4.3 Legal Factor for foreign Oil Companies: Buyback Contracts

Throughout the history of the petroleum industry in the country, Iran's wealth in fossil fuels has attracted considerable attention from International Oil Companies (IOCs). Entry into the market is not, however, as simple as in other parts of the region. Current Iranian law prohibits foreign corporations from owning any part of the country's resources. Naturally, this has had great impact on the structure and development of the oil and gas industry, and may be considered one of the primary causes for the current difficulty in acquiring sufficient investment in all sectors.

In order to develop the country's oil and gas resources, it is absolutely necessary to have foreign investment and technical know-how beyond what NIOC possess. To circumvent the ban on direct ownership, a system of Buyback Contracts has thus been developed over the last three decades.

Though no two contracts between NIOC and an IOC are the same, the system itself is fairly simple. The IOC agrees to undertake exploration and development of an oil or gas field, or part of an oil or gas field. Essentially, it is acting as a technology service company (van Groenendaal, 2006), providing the necessary engineering, procurement, and construction services. Once the IOC has completed exploration and development as outlined in the contract, production is handed over entirely to NIOC. In return, NIOC pays the IOC a set price from sales revenue of the developed project.

Four main elements make up a typical buyback contract (van Groenendaal, 2006). The expected capital expenditures for the IOC during the investment period (usually several years) are agreed upon, as are the expected bank charges/interest rates. Beyond this, the remuneration to be given the IOC for its services is agreed upon, plus a rate of return (of about twelve to fifteen percent, depending on the production schedule and initial investment). The remuneration, to be paid back by NIOC over an agreed-upon period of usually seven to twelve years, includes coverage of the expenses initially laid out in the contract. However, should the actual expenses exceed these initial estimates, NIOC's buyback contracts do not cover the additional expense. Nor does remuneration include a share in the profits.

While profits can still be considerable for the IOC, the buyback contracts clearly favour NIOC. Several drawbacks exist for the IOCs. Since they are only paid for the expenses outlined in the contract, they bear considerable risks should expenses exceed the projections. This can happen frequently, of course, in an industry which is by nature high-risk. In addition, should the field prove less plentiful than expected once production has started, NIOC is likely to postpone or slow down the remuneration payments. This is also the case should oil (or gas) prices fall below the agreed-upon projected threshold of the contract, if there is a cut in production due to accidents, or if operation and maintenance costs exceed projections (van Groenendaal, 2006). While the IOCs are thus technically protected from losing their investments completely, they are by no means insulated from the production process. Perhaps the greatest drawback to the payback contracts, however, is the lack of any kind of profit sharing agreement. Given the wealth of oil and gas resources in the untapped fields, this is of particular consequence. One final

factor which makes buyback contracts sub-optimal for IOCs is that the nature of service contract does not allow them to include their Iranian operations as resource-assets on their balance sheets, which has a significant negative impact on company value.

# 3: Scenario Model

## 3.1 Scope

Operating in Iran currently means operating under conditions of level four uncertainty, and it appears unrealistic, given the political cause of this, to expect a stabilized situation with predictable future in less than a year. The scope of the scenario predictions should in fact be extended quite a bit further. Two main factors play a role here. The first is, obviously, the political situation in Iran. Considering events of the last decade, it would be very accurate to say that political change happens very slowly in the Islamic Republic (if at all) – hence the failed attempts by the previous president, Khatami, to reform the system and create a more liberal government less intent on antagonising the international community. On the other hand, we have the possibility of revolution, or at least rapid, radical change, if the protestors do in fact prevail. Either way, it will take several years before the impact and permanence of a new line of government has becomes evident.

The other factor which plays a significant role is the nature of the oil industry. Given the long history of the industry, the scope of financial investment, and the amount of assets generally involved in oil and gas projects, even if we are just dealing with IOC exploration (as in Iran), then it is not surprising that International Oil Companies tend to think in years, even decades when considering project involvement – this is especially true given the percentage of untapped and underdeveloped fields in Iran. It makes no

sense, therefore, to have the time scope of the scenario projections cover less than several years.

Long-term predictions in the oil industry are difficult, however, especially in the current global economic downturn, and the increased interest in the last few years in shifting to renewable/ non-fossil fuel energy sources. Predictions for longer than the next ten years are therefore likely to be extremely uncertain themselves. Taking all these factors into account, it thus seems best to limit the scope of the scenarios to a ten-year time frame, expecting a relatively stable situation in the next five to ten years. This is the option chosen for this analysis.

It should also be noted, finally, that this analysis will focus on the perspective of large IOCs who have either already established a foothold in Iran (as have Eni, Total and Shell) or rival corporations who are likely to be interested in entering the market, under the right conditions (such as ConocoPhillips).

## 3.2 Stakeholders

### 3.2.1 Iranian Government

The principle stakeholder in the Iranian oil and gas industry is the government. As yet, all oil and gas resources in Iran are state property, and state-run NIOC has all development and production rights. Since oil and gas are the most substantial part of the Iranian economy as well as direct government revenue, changes and/or developments here have a tremendous impact. Its fossil fuel wealth is also the main source of power for Iran on the international stage, opening up options for alliances with many emerging markets as well as the oil-dependent West. This makes it extremely likely that the

government will continue to maintain as much control over the sector as possible – not only through the Ministry of Petroleum and NIOC, but also through direct talks with interested parties (primarily national oil companies of other emerging markets), and through regulatory measures.

While the industry will remain relevant no matter who is ruling the country, government action ultimately depends on the result of the power struggle currently underway in the highest ranks of the mullah-regime as well as the streets of Teheran. How and in which direction government will influence the industry in the years to come is thus one of the least certain factors of this analysis.

### 3.2.2 NIOC and Subsidiaries

***NIOC***

The state-run National Iranian Oil Company (NIOC), established in 1948, is the only oil company permitted to go forward with oil and gas production in the Islamic Republic of Iran. It has had sole control over all Iran's upstream operations since the nationalisation of the country's oil and gas reserves in 1980, the year after the Islamic Revolution (Business Monitor International, 2009). Given the Islamic Republic's vast wealth in fossil fuels, this makes NIOC one of the world's largest oil companies in terms of production, if not geographically. All Iran's developed fields and rights to reserves, onshore and offshore, belong to NIOC or its subsidiaries. The company thus possesses reserves of over 137 billon barrels of crude oil (Business Monitor International, 2009).

NIOC is severely limited in its financial and operational freedom, being dependent on Government direction. It is not permitted to undergo joint ventures (only

sub-contractor contracts) with International Oil Companies, and has had increasing difficulty in covering its rising investment requirement.

The situation has worsened recently due to the drop in oil prices. These have resulted in a budget slash of over thirty percent for the fiscal year beginning March 2009. None-the-less, NIOC continues to be sought after by numerous companies considering entering the market – if there will be enough to meet the needed US$24 billion for investments this year remains to be seen (Business Monitor International 2009).

***NIGC***

The National Iranian Gas Company (NIGC), established in 1965, is responsible for the treatment, transmission, and delivery of natural gas to the domestic, industrial, and commercial sectors and power generation plants. As outlined earlier, there is much growth potential in this segment of the industry, given that NIGC can overcome the current weakness of its underdeveloped network (Business Monitor International, 2009).

***NIORDC***

The National Iranian Oil Refining and Distribution Company (NIORDC) is one of the Ministry of Petroleum's most powerful subsidiaries, having full responsibility for downstream operations in the Iranian oil industry (Business Monitor International 2009). Separated from NIOC in 1992, NIORDC now holds a national refining monopoly, also controlling the extensive pipeline infrastructure and the fuel distribution segment. NIORDC owns nine out of ten crude oil refineries in Iran, located in Teheran, Tabriz, Isfahan, Abadan, Kermanshah, Shiraz Bandar Abbas, Shazand e Arak, and Lavan Island – the largest refinery, with a capacity of 350 000 barrels/day, is Abadan. In addition,

NIORDC also manages 14 000km of transfer pipelines. According to Business Monitor International (2009), NIORDC distributes 190 million litres of petroleum products daily, with an additional 60 million litres being exported. The largest importers of Iranian petroleum products are Japan, China, Turkey, Italy, South Korea and the Netherlands.

NIORDC shares the same strengths and weaknesses as other Ministry of Petroleum subsidiaries. While it has a clear advantage thanks to its government-protected near-monopoly status, the bureaucratic apparatus of the Ministry considerably hampers operational freedom. There is a strong influence of political manoeuvring, which means choices are not always based on the best economic interests (of either company or the Ministry).While the increased energy demands of the Iranian population (as well as international) is steadily increasing the market for NIORDC's products, the company is in dire need of further (international) investment and considerable technological upgrades (Business Monitor International, 2009). Meeting the demands of growing domestic fuel requirements is clearly going to be a challenge, especially with the difficulty in attracting international partners (as with NIOC).

As state-run enterprises, the actions of all Ministry of Petroleum subsidiaries are highly dependent on who has government power and what national policy on the industry will be. Since oil revenue is likely to be key to any government, it would be logical to have a high degree of continuity. However, a restructuring of the industry cannot be ruled out in the future.

### 3.2.3 IOCs currently in Iran

The IOCs and NOCs which are currently in Iran have braved considerable risks in order to establish a presence in this market. Barriers to the Iranian market are extremely high, yet the abundant fossil fuel resources are becoming increasingly appealing as options for new exploration and development shrink elsewhere. It is to be expected that most current IOCs will attempt to expand their influence and broaden their access to the huge resources should current constraints become less significant.

***Eni***

Eni Iran is the Iranian branch of Italian oil company Eni. Established in 1957, it is one of the foreign companies with the longest-standing ties to Iran. It had originally entered the country on a joint venture with NIOC, but its Iranian interests were nationalised after the revolution, and the company did not re-enter the Islamic Republic until 1999 (Business Monitor International, 2009). Together with Total, Eni Iran is now developing the offshore Dorood field. The company also has considerable involvement in development of the South Pars field, and the onshore Darkhovin oil field. It appears clear that Eni is keen to retain its current strong and well-established position (compared to other IOCs) in the Iranian market, as well as its generally positive relationship with NIOC. However, due to the sanctions and national situation, like all IOCs in the market it is operating in a volatile political environment.

Eni Iran's oil production for 2007 was at 26 000 barrels per day (Business Monitor International, 2009). However, it is expected that the company will shift its focus towards the gas sector in the near future, as the potential of this fast-growing global market is more financially rewarding in the long term.

### *Total*

The French company Total Iran is operating under similar circumstances to Eni Iran, and is involved both in the oil and natural gas sector. The company is operating on a somewhat smaller scale than Eni (15 000 barrels/day), and is currently having problems with NIOC due to plans to freeze gas export involvement (the result of US sanctions pressure, but also, technical concerns) (Business Monitor International, 2009). Total too was present in pre-revolution Iran's oil industry, and re-entered the market in 1995 with its first buyback contract (completed in 2000). Currently, the company's involvement primarily lies in several development Phases of the South Pars gas field.

### *Shell*

The third major IOC involved in the Iranian oil and gas sector is Shell, which has partnered with NIOC for gas field development and LNG/GTL projects (Business Monitor International, 2009). Shell's venture into the Iranian market has been considerably limited by the US sanctions, however, and there is some question over whether the limited gains to be made from buyback contracts will prove enough motivation for the company to expand its operation in the country. Its investment in South Pars Development Phases 13 and 14 is currently on hold. Outside buyback contracts, Shell is also participating in a joint venture with refining company Pars Oil Company (a NIOC subsidiary) to produce industrial lubricants.

### *Other Players*

Several IOCs and NOCs are currently involved to varying degrees in the Iranian market (see Exhibit 3). Other companies are StatoilHydro, Lukoil, OMV, Gazprom., Inpex, CNCP, CNOOC, PTTEP, ONGC/OVL, and Sinopec.

*Figure 2: Other IOC/NOCs in Iran*

| Company/Country | Involvement in Iran Oil and Gas Sector |
|---|---|
| **StatoilHydro (Norway)** | StatoilHydro holds a 37 percent stake in Phase 6, 7 and 8 of the South Pars gas field, with additional agreements to do studies in improved recovery from three south-Iranian oil fields (Ahwaz, Marun and Bibi Hakime).<br>As of August 2008, StatoilHydro has frozen further investment in South Pars development, the result a US probe as to whether the company had exceeded the US$20 million investment permitted under the Iran Sanctions Act. |
| **Lukoil (Russia)** | Lukoil received permission to develop North Azadegan, Kushk and Hosseinieh oil fields in 2004. Prior to that, the company was also given approval for oil exploration in the Anaran block (a project currently being handled by StatoilHydro). |
| **OMV (Austria)** | OMV signed a US$18 billion Memorandum of Understanding with NIOC in 2007, for Phase 12 of the South Pars LNG project – OMV's first venture in Iran. |
| **Gazprom (Russia)** | Gazprom is currently involved in Phase 2 and 3 of South Pars development (30% interest). There is also the possibility of Gazprom's involvement in the planned gas pipeline to India and Pakistan, and help in improving development and recovery rates for North Azadegan and Caspian Sea oil fields. Gazprom Neft (the gas company's oil branch) also signed a Memorandum of Understanding in December 2008 for development of the Central Zargos Fields (estimated reserves: 274 million barrels) |
| **Inpex (Japan)** | After failed talks in 2006 regarding development of the Azadegan oilfield development (26 billion barrel crude oil reserves), Inpex now is a junior partner in the project, with a 10% stake. |
| **CNCP (China)** | NIOC had been looking for a foreign partner to develop North Azadegan oil field, and in January 2009 signed a buyback deal with Chinese company CNCP. The company also has some involvement in Kouh-Dasht concession and the Pars LNG project. |
| **CNOOC (China)** | CNOOC signed a development plan with NIOC in November 2008 for the North Pars gas field, after initial negotiations (for a US$16 billion deal) in February failed. |
| **PTTEP (Thailand)** | PTTEP signed a buyback contract in 2005 for exploration and development of Saveh in North-West Iran. Minimum investment pledged was US$ 14.5 million. |

| | |
|---|---|
| **ONGC/OVL (India)** | ONGC/OVL, the overseas branch of the Indian national oil company ONGC submitted a feasibility report for oil discoveries in the offshore Farsi Block. |
| **Sinopec (China)** | In December 2007, the oil refiner signed a US$2 billion agreement to develop Yadaveran oil field (3.2 billion barrels recoverable oil and 76 bcm recoverable gas). |

(Business Monitor International,2009)

### 3.2.4 Other IOCs/NOCs

It is highly likely that some international oil companies not currently operating in Iran will attempt to enter the market once the political situation stabilizes, particularly if the current US sanctions change. Several companies have had to limit their involvement due to current conditions – the most recent example would be the Norwegian state company StatoilHydro (see above), which decided in August 2008 to freeze investment in the South Pars gas projects. Most affected by the sanctions are, of course, American companies. It is thus to be expected that ConocoPhillips, ExxonMobil, Esso, and others will consider entering the market as soon as sanctions are lifted. On the other hand, if Iranian leadership remains in the hand of conservative hard-liners, it seems doubtful that these companies will be able to enter the market. It also remains possible that further NOCs will seek to become involved with NIOC – again, much here depends on the strength of American deterrence, and the availability of alternatives.

### 3.2.5 Other Industry Players

The oil and gas industry of course encompasses far more players than just International and National Oil Companies, and governments controlling resources. A number of other kinds of companies play key roles, and many would enter the Iranian sector given the right circumstances.

A major industry branch is made up of engineering companies. Three of the largest competitors here, all with ties to the energy sector, are General Electric (United States), Siemens (Germany), and ABB (Switzerland). Each already has a well established presence in the Middle East, and extensive operating experience in the oil and gas sector, ranging from upstream services (both onshore and offshore production) over midstream all the way to downstream (refining, pipelines, distribution). None of the three major competitors has thus far set up operations in Iran (though some subsidiaries and/or recently acquired companies have previous project experience with NIOC and others). Given the growth potential of the domestic energy system (due to population growth and badly-needed technology upgrading) as well as the oil and gas industry itself, all three have a lot to gain by entering the Iranian market, should conditions permit it.

Other companies which are not classified as IOCs, yet play a significant role in the industry are oilfield service companies. Two of the largest, both with significant interests already in the Middle East, are Schlumberger and Halliburton.

### 3.2.6 OPEC

Twelve countries, eight of which are in the Middle East, make up the Organization of the Petroleum Exporting Countries (OPEC). These are Nigeria, Angola, Ecuador, Venezuela, Iraq, Kuwait, Libya, Algeria, Qatar, Saudi Arabia, the United Arab Emirates, and Iran. Previous members also include Indonesia (which suspended its membership in 2009 when it became a net importer), and Gabon (1975-94). The organization was founded in 1960, the officially stated purpose being to “co-ordinate and unify petroleum policies among Member Countries, in order to secure fair and stable prices for petroleum producers; an efficient, economic and regular supply of petroleum to

consuming nations; and a fair return on capital to those investing in the industry." ("OPEC: About Us", n.d.) The organisation controls seventy-eight percent of world crude oil reserves (the greatest non-OPEC reserves are held by Russia and Norway). OPEC thus functions as a powerful oil cartel, with the ability to significantly influence global energy policy, oil and gas supply, and petroleum prices. This was most evident in the Energy Crisis of 1973, when OPEC's refusal to sell oil to countries who had supported Israel in the Yom Kippur War lead to a quadrupling of crude oil prices. Repeatedly under criticism primarily by Western countries dependent on OPEC's oil supplies, the organization uses a system of quotas in order to maintain beneficial price stability. Though the organization is no longer as powerful as it was, it still plays a significant role, and will take a very strong interest in major shifts in one of its member countries.

Iran is one of the founding members of OPEC (along with Saudi Arabia, Iraq, Kuwait and Venezuela). Its history with the organization has not always been smooth, and the country is not known for adhering to its OPEC quotas. Most recent figures show that the Islamic Republic tends to produce slightly above its quota, closer to its actual capacity – just under four million barrels/ day of crude oil in 2007 compared to the permitted 3.86. It is to be expected that OPEC countries will continue to take a strong interest in the developments in Iran, both political and, consequently, the effects on the oil and gas industry.

### 3.2.7 International Community

Iran's political and economic situation can have a significant impact both regionally and internationally. The Islamic Republic is a significant power in the Middle East and is especially influential in Iraq's ethnic/religious conflict. Western powers are

most likely to feel threatened by an Iran which continues on its hard-line nationalistic course (including its current nuclear energy policy), along with increased economic importance resulting from expansion primarily of the natural gas sector. Of growing relevance is also Iran's relationship with the emerging markets of China, Russia and India. It seems likely that these countries will demonstrate less concern over Iran's internal politics (and nuclear ambitions), being less affected by the US sanctions, provided the Islamic Republic is able to guaranty a dependable energy supply.

## 3.3 Basic Trends

### 3.3.1 Overview of Environment

As outlined by Austin and others, factors from a number of different areas come together to shape the environment of a given country and industry. For the purpose of determining key trends and influences in Iran's oil and gas industry, it is thus essential to map these factors in order to determine the driving forces which are likely to shape the environment over the next years. This analysis will follow Austin's framework of Political, Economic, Social/Cultural and Demographic factors. It will also include a map of key drivers and influences as determined by the environmental analysis.

### 3.3.2 Political Factors

#### 3.3.2.1 Current System and Leaders

Officially named the 'Islamic Republic of Iran' since the revolution of 1979 which toppled the very pro-Western (and American-supported) autocratic ruler Shah Mohammed Reza Pahlavi, Iran is a now a theocratic republic dominated by the Shia faith. The system of government is based on the Constitution ratified by referendum in

December 1979. The Constitution itself was created by the first Assembly of Experts, which convened under the first Supreme Leader and founder of the Islamic Republic, the Ayatollah Ruhollah Musavi Khomeini.

The system of governance in Iran is complex, comprising a combination of elected officials (Parliament, the President, and the Assembly of Experts) and unelected, controlling roles – headed by the Supreme Leader. As a Shia-faith based theocracy, religion, law and government are intrinsically linked in Iran. In order to ensure continuation of Islamic principles in accordance with the Leadership's interpretation and definition of Shia faith, a complex control system has been established. Essentially, through the control he has over choices of Presidential and Parliamentary candidates, the Guardian Council, and the Judiciary, the Supreme Leader is in a position to significantly shape the political actions of Iran. In practice, this has lead to a strong conservative, even fundamentalist trend in Iranian politics, with the reformist movement of the opposition considerably dominated by the mullah regime.

The Islamic Republic of Iran is the only country in the world governed by the system of theocratic democracy. It has become increasingly isolated in the thirty years since the revolution. This is true not only for its relationship with the West, but also other countries of Middle East, where the Republic's radical leadership style is considered a dangerous precedent by the (monarchic) powers that be.

#### 3.3.2.2 Legal Situation

Iran's legal system is grounded on Sharia (Islamic Law). The highest authority of the Judicial branch of government is held by the Supreme Court, whose members are appointed by the Head of the Judiciary, who in turn is appointed by the Supreme Leader.

The Supreme Court has thirty-three regional branches, thirty-one of which are situated in Teheran. The role of the Supreme Court is "enforcement of the laws by lower courts, [setting] judicial precedent, and [acting] as a court of appeals" (Library of Congress, 2008, p.15).

The greater part of Iran's commercial laws have been in place since well before 1979. According to a Wood Mackenzie study, this covers "laws dealing with the protection of foreign investment, contracts, trademarks, patents, property and securities, […] in conjunction with a well-established Napoleonic commercial and civil code which defines various corporations, agencies, pledges, contracts, etc" (WoodMackenzie, 2008, p. 42). Two laws which are of particular relevance are the Petroleum Act from 1974, and the Oil Act from 1987. It is due to the Petroleum Act that ownership rights of natural resources are not permissible for foreign companies. As a result, all IOC involvement in Iran is limited to what are, in effect, service contracts. The Oil Act of 1987 initially ended all foreign investment in the industry, nationalising it entirely and giving the Ministry of Petroleum complete control over the industry. However, by the mid-1990s, the industry found itself in dire need both of foreign capital and updated technology. Consequently, the option of service contracts was re-opened, and several IOCs eventually returned to the Islamic Republic.

In spite of its thorough legal structure, Iran does not present a favourable legal environment for foreign companies to invest in. There are significant concerns over corruption, as well as the Iranian legal system in general. According to the Business Management International (2009), Iran's commercial legal code is complicated and inadequately enforced, which significantly weakens the effectiveness of the judicial

system as a whole. Corruption is rife, with political interference in the judiciary commonplace, and political and business interests being pursued by senior officials. Iran ranks fifteenth out of eighteen in Transparency International's *Corruption Perception Index* for the Middle East alone (ahead only of Yemen, Syria and Iraq), and 141st out of 180 worldwide (Corruption Perception Index, 2006). In essence, there is little or no use in reliance on a speedy court system, or written contracts without other connections. Consequently, a number of negotiations between NIOC or the Ministry of Petroleum on the one hand, and foreign investors, IOCs or NOCs on the other hand, are delayed or fail.

In terms of taxes, the Islamic Republic presents a relatively positive picture for IOCs with its favourable corporate tax system. The corporate tax rate was recently capped at 25%, and most companies pay significantly less.

#### 3.3.2.3 Geopolitical Links

***Memberships***

Iran is a member of several regional and global organizations. It has been a member of the United Nations since 1945. It is also a member UNESCAP, UNIDO, UNCTAD, UNESCO, UNHCR, and has observer status for the WTO. Two of Iran's most significant memberships are with OPEC and OIC, however. Iran is a founding member of OPEC, and, as its second largest oil-exporter, quite powerful. It is also a member of the Organisation of the Islamic Conference (OIC), an intergovernmental organisation of fifty-seven Muslim countries, founded to promote Muslim principles in political, economic and social contexts worldwide (including the creation of a 'Declaration of Human Rights in Islam to rival the U.N.'s Universal Declaration of Human Rights).

Regarding significant international treaties, Iran is a signatory to the Kyoto Protocol, the Comprehensive Nuclear Test Ban Treaty, Biological Weapons Convention, Chemical Weapons Convention, International Atomic Energy Agency Safeguards Agreement, Partial Test Ban Treaty, and Treaty on the Non-Proliferation of Nuclear Weapons. In spite of this, concern over Iran's nuclear activities continues to be one of the greatest concerns over Iran in the international community.

### *International Relations*

#### *United States*

In a speech from January 2002, then US President Bush coined the term 'Axis of Evil', denoting those countries perceived by the White House as being active in state-sponsored terrorism. The three countries thus labelled were, of course, North Korea, Iraq, and the Islamic Republic of Iran. The statement by Bush was just one further low point in a relationship which has been extremely tense for thirty years, since the Islamic Revolution toppled the US-backed Shah (and the diplomatic crisis surrounding the US Embassy hostages the following year).

The history between the US and Iran goes back considerably further, however, and has rarely been positive. This is evidenced by the general negative opinion of the US displayed not just by regime hardliners. Key episodes of US intervention were CIA involvement in the overthrow of Mossadegh's government in 1953, after the prime minister attempted to nationalise the oil industry; support for the Shah, who guaranteed US oil interests in Iran; and support for Saddam Hussein in the Iran-Iraq war of 1980-1988 (Klein, 2005).

The election of Barack Obama as President, and thus the expected reversal of neo-conservatively dominated US foreign policy, seems to have eased tensions somewhat. However, it is as yet unclear what direction future relations will take. The appointment of Hilary Clinton as Secretary of State was not taken as a positive sign by the regime in Teheran – Ms. Clinton has been exceedingly unpopular since her statement during the 2008 presidential primary election that appropriate US reaction to an Iranian nuclear attack on Israel would be to totally obliterate (Pilkington, 2008) the country.

There has continued to be strong undertone of hostility towards the US and other foreign powers by Ahmadinejad. In this populist attitude, the President has considerable support, both of the conservative elements in the government as well as in large parts of the population**.** None-the-less, he did send a letter of congratulation to the President-elect in November. There have since been no indications, however, that the current regime will actively seek to improve relations. The *Economist*'s *Country Report* from December 2008 speculates that the Obama administration, in turn, may be delaying concrete positive dialogue/ reaching out until the outcome of the Presidential election is clear. Most recently, repeated accusations of Western meddling have also been made in the aftermath of the election on June 12$^{th}$. This does not bode well for future US/Iranian relations should Ahmadinejad indeed emerge as victor in the country's current political crisis.

The problem of Iran's nuclear activity remains, with Ahmadinejad's government (evidently supported by the Supreme Leader) continuing to follow a course of non-coorporation regarding its nuclear industry. In spite of the 2007 report by sixteen US government agencies that Iran ceased its quest for nuclear weapons in 2003, a cooling off

between Iran and all Western powers could be seen, even before the additional trouble caused by the election. Iran is reportedly eighty percent on the way to developing nuclear arms – it is thus probable that the US will seek to take relative quick action (whatever form that action may take) once the consequences of the Iranian election have become more apparent.

***Israel***

Relations between Israel and Iran continue to be extremely volatile, with the threat of armed engagement by either side not to be dismissed. Iran's attitude towards the Jewish state continues to be hostile, and the possibility of a military strike by either side remains.

The two countries had relatively positive relations during the reign of the Shah, sharing the bond of being the only two non-Arabic nations in the Middle East. However, since the Islamic Revolution, the official creed of the Iranian government has been to deny Israel the right to nationhood, considering it an enemy to Islam, and the 'Little Satan' to the United States' 'Great Satan'. While relations were somewhat calmer under previous reformist president Khatami, Ahmadinejad has publically denied the Holocaust, thereby re-affirming Iran's hostile and threatening stance towards the Jewish state. There have also been repeated statements by the President to "wipe Israel off the map" (Goldberg, 2009).

On the Israeli side, the re-election of conservative leader Benjamin Netanyahu as Prime Minister this year indicates a hard-line course against the Islamic Republic. In order to combat the threat of a nuclear attack, Netanyahu has made clear there is no willingness to compromise. As stated soon after his election, the leaderships current view

is that the U.S. "must stop Iran from acquiring nuclear weapons—and quickly—or an imperilled Israel may be forced to attack Iran's nuclear facilities itself." (Goldberg, 2009, para. 1). The Prime Minister's view on Iran could not be more explicit than in his comment that "You don't want a messianic apocalyptic cult controlling atomic bombs. When the wide-eyed believer gets hold of the reins of power and the weapons of mass death, then the entire world should start worrying, and that is what is happening in Iran" (Goldberg, 2009, para. 2).

### *Middle East*

Iran's position in the Middle East is unique. With the exception of Israel, it is the only non-Arab state in the region. It is also the only country worldwide with a Shia majority in the population. People of Shia faith are a minority in the Muslim community, and most Sunni-dominated countries (particularly Saudi Arabia), tend to view their own Shia minorities with suspicion – a rift which dates back to the time of the Caliphates after the Prophet Muhammad's death. Traditional mistrust between Sunni and Shia thus causes a considerable amount of tension between Iran and its neighbours. This is of particular consequence in Iraq, which has a sizeable Shia population (some estimate a majority) of its own. There has been some speculation recently, as the Islamic Republic becomes more isolated, that the regime's attitude is becoming increasingly imperialistic. Iran is already a regional superpower, and the populist rhetoric of the current president certainly implies intentions to increase this status.

Iran's involvement in Iraqi politics has been considerable since the fall of Saddam Hussein's regime in 2003. This involvement is viewed with suspicion and trepidation

both by Western powers (most notably, of course, the US) and by its Middle Eastern neighbours. The Islamic Republic has repeatedly been accused by other powers of meddling in the Iraqi power struggle, supporting terrorist activities and Shia leader Sadr. With regard to its other conflict-stricken neighbour, Afghanistan, Iranian involvement is apparently more limited (there is no significant Shia population in Afghanistan). Religiously and politically, there is no affiliation between Iran's leadership and the warring Sunni factions (government and Taliban) in Afghanistan.

### 3.3.3 Economic Factors

Approximately 80% of Iran's export revenue comes from the oil and gas industry. Though the political leadership of the country has thus touted its enforced economic isolation due to sanctions isolation as an advantage, a buffer against global recession, the reality is that global energy and other economic trends have a severe impact on the Islamic Republic.

Iran's GDP in 2007 was an estimated US$278.1 billion, with purchasing power parity at US$ 12 300 per capita. The estimated GDP growth rate at the time was 4.3 percent, though this has since dropped to 2.4 percent for 2009/10 (Business Monitor International, 2009) due to the impact of the global recession on Iran's economy.

The Iranian economy is dominated by the state-run oil industry. There are several other significant industries both in the state and private sector, however. Industries in the private sector include automobile, textile, metal-manufacturing and food processing, and a multitude of small-scale enterprises (Library of Congress, 2008). Others include Agriculture, some forestry, fishing, and mining industries.

The financial sector is dominated by the nationalized banking system – private banks (primarily small credit unions) have only been allowed to reopen since the early 2000s. The banking system is controlled by the Central Bank of Iran (Bank Markazi). According to Library of Congress (2008), accounts in state-owned banks consist primarily of loans to state enterprises and large private firms, while many wealthy Iranians prefer to use foreign banks when possible.

There have been considerable problems between President Ahmadinejad and senior officials of Bank Markazi over the last few years. The former is known for implementing populist fiscal policy without regard for long-term effects on the national economy, and has repeatedly dismissed financial leaders who attempted to oppose this strategy.

#### 3.3.3.1 Sanctions

The Iranian economy has been subjected to crippling international sanctions, which have considerably impeded foreign investment (primarily from US companies) and continue to contribute to the uncertainty and risk of doing business in Iran. The history of US sanctions against Iran begins with the United States Embassy hostage crisis of 1979, which resulted in President Carter initiating an embargo against all Iranian imports and exports (except for food and medicine), as well as prohibiting aid and military assistance. US-led sanctions have been in place against Iran in one form or another ever since (Torbat, 2005).

The official reason given under President Reagan (to the effect of the new import embargo of 1987) was that the sanctions were a response to the country's support of international terrorists and its aggression towards shipping in the Persian Gulf (Torbat,

2005). A similar reason was cited in 1995, when President Clinton issued sanctions against all bilateral trade and investment in response to the claim of Iran's sponsorship of international terrorism and attempts to obtain weapons of mass destruction (Torbat, 2005). The following year, 1996, saw the establishment of extra-territorial sanctions: the Iran-Libya Sanctions Act (ILSA). Extended by President Bush in 2002, ILSA in effect penalises foreign (non-US) companies which invest more than US$20 million in Iran's oil and gas industry (Torbat, 2005). The most recent effect of ILSA on Iran's industry was to be seen in August 2008, when the Norwegian state oil company StatoilHydro was forced to freeze investment in South Pars gas projects under U.S. pressure.

Beyond ILSA, US sanctions in relation to oil and gas involvement forbid US citizens from trading in Iranian oil or petroleum products refined in Iran, as well as from financing these actions. There is thus far no indication of whether or how policy on sanctions against Iran will change under President Obama.

### 3.3.4 Social/Cultural Factors

Culturally, Iran is different in many ways from other countries of the Middle East. Apart from the majority of the population following a different variation of Islam than most of the region, the most relevant factor here is probably language. Iranians are not Arabic but Persian, with a long and glorious history pre-dating the Arab invasion and introduction of Islam. Unlike other countries of the Middle East, where some variation of Arabic is spoken, the official language of Iran is Farsi. Farsi is an Indo-European language closely related to Hindi, and is generally far easier for most Westerners to learn than Arabic, which is a Semitic language. It should be noted, however, that knowledge of Arabic, the official language of Islam, is widespread.

No aspect of life in Iran remains untouched by religion. The influence of Shia faith has been pervasive not just over the last thirty years. Though there is increasingly visible opposition amongst the population against doctrine enforced by the mullah regime, with demands of greater freedom of choice regarding lifestyle, Islam is a central element of Iranian culture and will remain so even in the event of new leadership. Currently, social structure can be described as very conservative, with traditional gender roles and conservative values in most areas. How great a number of the population wish to see change here, or how deep this change should be is difficult to gauge given the restrictions placed on media and freedom of expression. The aftermath of the election, however, which brought millions to the street to protest the ultra-conservative government's claimed vote-fraud is a clear indication of how deep the rift in Iranian society runs. No matter who will ultimately win the current power-struggle, they will be faced with a divided nation – the consequences of which are impossible to predict at this point.

### 3.3.5 Demographic Factors

Iran currently has a population of 72.2 million, two-thirds of whom live in urban areas – a steady increase from less than fifty percent urbanisation before the revolution. The annual population growth rate is less than one percent, but the majority of the population is under thirty. The median age is 26.4, and only 5.4 percent are over sixty-five (Library of Congress, 2008). The dominant ethnic groups are Persians (65 percent), Azerbaijani Turk (16 percent) and Kurds (7 percent). Two-thirds of the population have Persian (or Farsi) as their mother tongue, and it is a second language for much of the remainder. While Shia Islam is by far the dominant religion (and key government figures

must adhere to this faith), there is more diversity than is generally known in the West. Sunni Muslims are the largest religious minority, making up about eight percent. Other *recognized* religious minorities ("People of the Book") are Christians (300 000), Zoroastrians (32 000) and Jews (30 000). While all of the above minorities are expected to follow the dictates of Shia law, they are guaranteed some protection of religious freedom, and a degree of representation – five seats in total in national government. A fifth major faith, the Baha'i, a community of approximately 250 000 members, are not considered a legitimate religion, and have suffered repeated persecution since the revolution. In total, emigration percentages from religious minorities are much higher than the national average.

The literacy rate in Iran is above the regional average: 85.6 percent for men, 73 percent for women, 79.4 percent in general (Library of Congress, 2008). Official enrolment rates for elementary education up to age ten (which is compulsory), are at 98 percent. Numbers go down to 70 percent for high school, even though education is free (with the exception of private schools and universities).

The Iranian labour force amounts to approximately 28.7 million (numbers for 2007). Both unemployment (estimated at fourteen percent) and underemployment are a considerable problem, however. This is especially true for younger workers (Library of Congress, 2008). Recent initiatives as outlined by the Fourth Economic Development Plan (the Islamic Republic's fourth five-year plan) have had little effect here. Wages are quite low (minimum wage was US$120/month in 2005). There has been a history of unrest due to negative labour conditions in the last few years – beyond low wages, there is also widespread dissatisfaction over employment contracts. These have considerable

drawbacks for both sides, with employees on the one hand frequently forced to sign blank contracts, the terms of which a later filled in by the employer, and the employer often having to keep on employees because of high settlement costs.

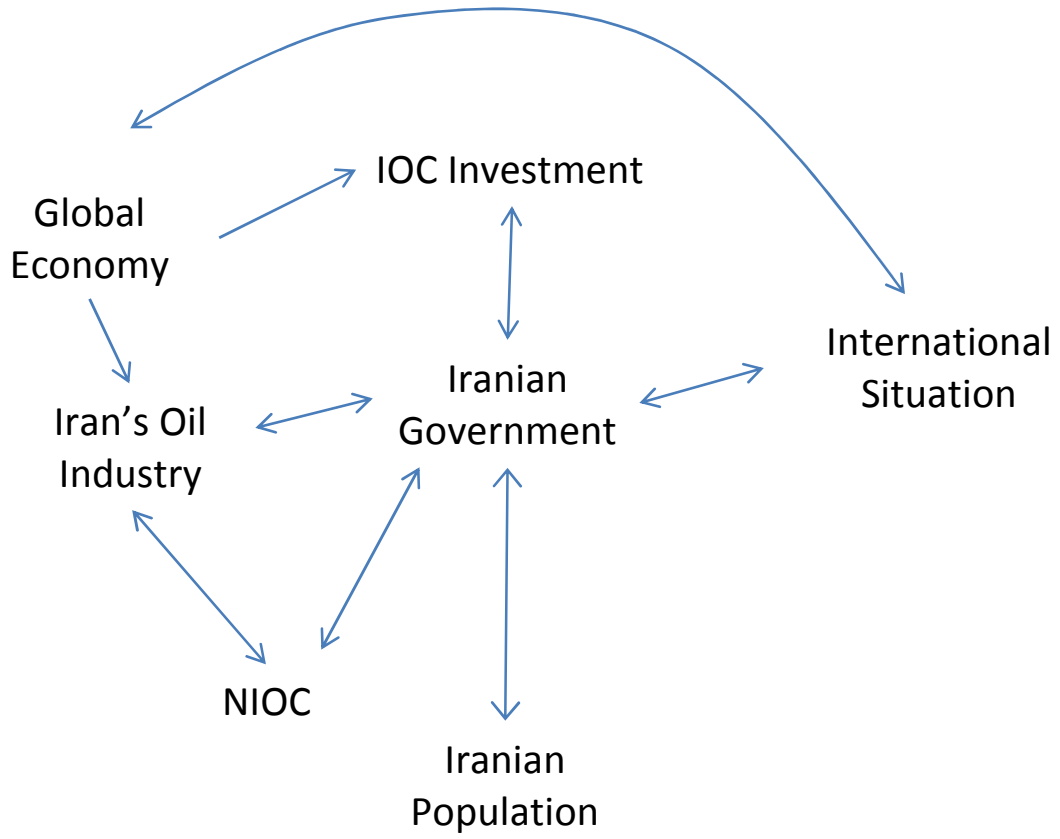
### 3.3.6 Trend Map/ Key Drivers

Based on the environmental factors above, it is evident that the two main driving/shaping forces for the future of the Iranian oil and gas industry are the nature of national government, and Iran's ability to export oil. These two factors are central in a number of ways, exerting influence on all other areas. Since the industry is centred around a state-run enterprise, NIOC, and international involvement is strictly limited, changes in political leadership are likely to have an immediate impact. This can concern not only changes in policy, but key personnel as well. Furthermore, in spite of being dominated by NIOC, the oil and gas sector is actively seeking foreign investment and IOC/NOC involvement, which will be vital in modernising and developing the industry. The political leadership's actions, as well as posturing on the international stage (in particular with regard to the Islamic Republic's nuclear ambitions), will have far-reaching consequences for both IOC willingness to invest, and the barriers to do so. These barriers come both from the outside, as with US sanctions, and are created internally, as with the restrictive buyback contacts. An additional twist, beyond the factor of who is running the country, is added by the ethnic tensions (Shia versus Sunni Islam) and Iran's involvement in conflicts in the region, particularly in Iraq.

Iran's ability to export oil is thus also highly dependent on the political leadership, and the Ministry of Petroleum and NIOC's ability to secure foreign investment in future years. However, there is the equally important factor of world demand for oil and gas,

and IOCs ability to make significant investments, both of which in turn are naturally heavily influenced by the global economy – particularly relevant since Iran is increasingly doing business with developing economies in Asia.

***Figure 3*: Drivers Map**




## 3.4 Key Uncertainties

The main reason for Iran's Level Four Uncertainty is the fact that the key drivers outlined in the previous section are also the key areas of uncertainty. The most significant factor by far here is the question of political leadership. Even a month after the Presidential election, officially won by Ahmadinejad but contested by his rival Mousavi and the millions of protesters who claim election fraud, consequences for Iran remain

unclear. Protests have been violently suppressed for now, and media reporting on the matter severely censored. Much is being speculated (and practically nothing is known) of a power struggle behind the scenes, between the Supreme Leader Khamenei, and the Chairman of the Assembly of Experts, Rafsanjani. Predictions for Iran's future range from a Velvet Revolution in the works to a totalitarian theocratic dictatorship, civil war, or eventual 'business as usual' – all without indication as yet on which way the country is heading. All that is known with some certainty is that the country is deeply divided, with both conservative hard-liners and opposition having strong support.

Even knowing who will emerge as leader of what may or may not remain the 'Islamic Republic' would not necessarily indicate the effects on the oil and gas industry, in particular with regards to international relations. The opposition is generally considered more willing to enter dialogue with the West, and be less antagonistic towards Israel in particular than the hard-liners around President Ahmadinejad. However, this does not mean by far that they would in fact behave entirely favourably towards Western powers – especially if this would mean sacrificing national unity even further. Consequently, there is also uncertainty about the effects on international relations, and about how the international community (primarily the US and Israel) will react.

The other main uncertainty remains, of course, the global economy. It is not clear yet how deep and far-reaching the global recession will be, and what impact it will have on oil and gas demand. It is possible that the situation will have improved considerably by 2010 (and it is likely though not certain that this will have a positive impact on need for oil and gas). This is by no means certain however, and a scenario with a long-drawn out deep recession is just as plausible.

## 3.5 Map of Scenario Themes

Both Schoemaker (1995) and van der Heijden (1996) suggest limiting themes/issues to a few central topics and developments. For Iran, these could be as follows (see Exhibit 4). Note that for the sake of maintaining overview, political developments have been limited to only two of the options mentioned earlier.

***Figure 4: Key Issues and Possible Developments***

| Key Issues | Possible Developments |
|---|---|
| Political Situation | • Ahmadinejad remains President<br>Opposition is completely suppressed<br>Conservative rule of the country becomes increasingly repressive in order to maintain control<br>Power of the Military within Iran increases<br>• Rafsanjani emerges as new leader after a Velvet Revolution<br>Upheaval on all government levels<br>Tension continues between conservative and more liberal elements |
| Economy | • Global economy picks up by the end of 2010<br>Demand for oil (and increasingly natural gas) is strong, particularly in developing nations<br>IOCs seek to invest in as yet undeveloped oil/gas fields<br>• The Global Recession intensifies<br>demand for fossil fuels is low because of production cuts<br>IOCs have limited ability to invest in new projects |
| International Relations | • Iran continues to pursue nuclear power, leading to worsening relations with the West and Israel<br>• Iran becomes more open to dialogue with the West, leading eventually to lightening of sanctions |

Following Schoemaker (1995), a good first step for creating plausible scenarios is to map out the various possible combinations of key issues and examine them for

plausibility. Schoemaker suggests taking two central uncertainties and 'crossing' them – this works well for Iran and the issues of political leadership and global recession. Since international relations are also going to play a considerable role in determining the future shape of the oil and gas industry, but are somewhat more dependent on the other factors, they can be added in as a third element to create a more complete initial scenario structure (see Exhibit 5).

***Figure 5:*** **Scenario Combinations**

| **Scenario 1** | **Scenario 2** | **Scenario 3** |
|---|---|---|
| • Ahmadinejad remains President<br>• Global Economy significantly improves by 2010<br>• Increase in International Tension | • Ahmadinejad remains President<br>• Global Economy significantly improves by 2010<br>• More Dialogue with Western Powers | • Ahmadinejad remains President<br>• Global Recession continues to impact energy demand<br>• Increase in International Tension |
| **Scenario 4** | **Scenario 5** | **Scenario 6** |
| • Mousavi is new leader<br>• Global Economy significantly improves by 2010<br>• More Dialogue with Western Powers | • Mousavi is new leader<br>• Global Recession continues to impact energy demand<br>• Increase in International Tension | • Mousavi is new leader<br>• Global Recession continues to impact energy demand<br>• More Dialogue with Western Powers |

## 3.6 Consistency and Plausibility

The first and second issue of each scenario outlined above are relatively independent, although of course economic conditions in Iran will affect the leadership's

ability to retain control. Generally, however, all of the above combinations are plausible options, though some scenarios are potentially more stable than others. Thus, whoever is leading the country will have a much easier time if the global economy (and therefore probably the Iranian economy, most notably the energy sector) improves sooner rather than later.

The third issue so important to developments in Iran's energy sector, International Relations, is more directly linked, particularly to the outcome of the power struggle. While no option outlined above can be completely discounted, Ahmadinejad's past actions do not at all indicate that he is willing to give up his past stance regarding nuclear ambitions, or his inflammatory rhetoric about Israel. On the contrary, it seems that much of his support is based on his ability to project a 'strong man' image for both himself and the country as a significant power within the region that will not take orders. Mousavi and his allies, on the other hand, have indicated that they are at least open to dialogue and a less than confrontational course, and generally would seem to be the political leaders preferred by the West. This is far from a foregone conclusion, however.

## 3.7 Two Possible Scenarios for Iran's Oil and Gas Industry by 2019

### 3.7.1 Scenario 1

The status-quo of both country and region remain essentially unchanged for this scenario, though there is a radicalization of the regime in response to opposition's attempts to challenge the official election outcome. The radicalization leads to an increasingly totalitarian system. Ahmadinejad retains his power, thanks to the support of the Supreme Leader Khamenei and, increasingly, his extensive ties to the Military and

support from militia groups. He has millions of supporters in the country who agree with his general worldview. Main figures of the opposition, most notably Presidential candidate Mousavi, and former President Khatami are pressured into silence for the sake of unity in the country – the opportunity for radical reform in the wake of the election has passed. What remains is an increased sense of threat for the regime from the opposition. Thus, increasingly severe censorship after the election remains in place, clerics who had voiced support for the opposition lose authority, and within the state-apparatus there is a 'clean-up' to ensure only supporters of the President hold key positions. This includes the Ministry of Petroleum and its subsidiaries.

Relations to the West remain bad. Particularly cool are the relations to those European countries which had called for a stop of violence against protestors. Great Britain continues to be singled out by the regime as agitator and a threat. In response, diplomatic ties between Britain and Iran break off. While the European Union does not impose sanctions on Iran, it thus becomes more difficult even for European IOCs such as Shell to remain in the country. American sanctions stand.

The deadline of year-end 2009 expressed by the Obama administration regarding dialogue on nuclear issues passes without too great a change. With the election out of the way and concerned about the rift a home, Ahmadinejad has somewhat toned down on Iran's nuclear projects, buying time. The Obama administration, in turn, is not inclined towards a military strike and instead intensifies the sanctions, choosing to focus its efforts on stabilizing the situation in Afghanistan and Iraq. Rumours abound, however, of increased American support for the opposition. This in fact strengthens Ahmadinejad's position at home.

The global economy has found itself in a considerable upswing since 2010, and this has had a positive impact on the Iranian oil and gas sector. Growing demand for natural gas has made Iran attractive to a number of NOCs, despite the country's growing pariah status. In order to obtain the considerable investments needed by the sector, the government has strengthened ties to China in particular. Russia too is not too daunted by American Sanctions and EU disapproval. Focus and eventual dependency on NOCs from these emerging economies, however, make the government and Ministry of Petroleum vulnerable to pressure. They are eventually forced to modify the buyback system, which significantly decreases profits. As the heavy sanctions have made Iran even more reliant on its oil and gas revenue, this means that while there is some improvement in the country's economy, tensions remain.

### 3.7.2 Scenario 6

Current leaders Khamenei and Ahmadinejad sought to continue business as usual, violently suppressing increased calls for reform. Ultimately they proved too out of touch with the population, and the opposition prevailed. The result was a Velvet Revolution, which left Rafsanjani the new Supreme Leader and Mousavi President. While the country is still officially the 'Islamic Republic of Iran', much has changed. Apart from a general liberalisation of society (for example, it is no longer compulsory for women to wear hijab), there have been far-reaching consequences within government. Most key positions have been filled by reformists. This includes the Ministry of Petroleum, which consequently slowed development down temporarily.

The new leadership is still treading carefully however, mindful of the deep rift in Iranian society. Changes in the actual system have thus been slow, and Sharia law is still

in place. President Mousavi is taking care not to appear overly friendly or make too many concessions to Western powers regarding nuclear talks. In general, however, the new leadership is staying low key on the international stage, trying to antagonize neither conservative elements within the country nor foreign powers. Communication channels to both Europe and the US are open, but there remains tension about the nuclear ambitions, which the Reformers are disinclined to abandon. One result of this is that the sanctions remain untouched.

Mousavi's already tenuous position is weakened by the troubled state of the economy. As the global recession continues, both oil and gas demand are not increasing as rapidly as predicted. NIOC and the Ministry of Petroleum do not succeed in securing the new investments they had hoped for, and the sector continues to grow only slowly. To encourage IOC investment, the buyback contracts are modified, allowing for joint venture options and shares in profit. However, they still do not allow for foreign ownership of resources. Investment picks up somewhat, both amongst IOCs and NOCs from Asia.

# 4: Conclusion

As stated repeatedly in literature on scenario-building (van der Heijden 1996, Schoemaker 1995), the scenarios are neither a prediction of the future, nor the only tool on which a company operating, seeking to operate in an environment of Level Four Uncertainty, should base its strategy. It provides one plausible vision of what the future may hold, and it is up to decision makers if and how to use that vision. The two brief scenarios outlined above are no more or less likely than any of the other four mapped out earlier, or any number of others that use different variables. Nor do they mark the extreme ends of any kind of 'range' of futures (Iran being, after all, an environment of true ambiguity for the time being).

The two scenarios do provide some basis for early thoughts on which direction company strategy might best take. Thus, going back to the initial postures and actions outlined by Courtney *et al* (1997), and summarized in chapter one, it does not seem like either scenario allows for a shaping strategy – there is simply too much dependent on the outside factors of political crisis, government control, and global recession. Both scenarios, however, leave room for adaptation or reserving the right to play, depending on company ability and preference. In terms of actions, it may be possible to differentiate more between the two scenarios. Risk is very high in both, with an uncertain future – be it because of increasingly totalitarian government style, as in Scenario 1, or because of barely-hidden, ongoing power struggle as in Scenario 6. This makes any no-regrets move a company might undertake when entering the Iranian Oil and Gas Sector rather difficult.

However, given the higher volatility of Scenario 6, it seems that a big bets action here is more likely to pay off, especially for IOCs, who are anticipated to have a diminished role in Scenario 1. It is quite possible that a risk-friendly major IOC such as Royal Dutch Shell would be willing to take a gamble on major involvement under new government, which could pay off if and when buyback contracts are removed for IOCs. For Scenario 1, on the other hand, where the rules of the game appear more clear-cut and stable (though not at all in favour of IOCs), the likelihood of dramatic change paying off seems diminished, making a Big Bet strategy less appealing. This again, however, depends to a great extent on the individual company. Coming to an arrangement with what can be assumed to be the long-term ruling power, and adapting to the fact of lesser profits, would make more sense here. Both options are of course dependent on whether the company chooses to enter the sector at all under either scenario – far from established fact.

Further use of the scenarios needs to be company-specific. A useful next step for an IOC using scenarios would be to incorporate internal analysis and evaluate the scenarios further, according to, amongst other things, van der Heijden's (1996) actor-stakeholder matrix. Decisions ultimately need to be made on how these particular scenarios are to affect company strategy at this point – something merely to be kept in mind, or already actively planned for? Does the company have the ability (and desire) to become a significant player in Iran's oil and gas industry in the future? Should attempts be made to enter the market at all? Are there elements of each scenario which might be addressed by the same actions? According to these factors then, a company can choose its

actions, be they big bets on a favourable environment and the disappearance of buyback contracts, or a less risky turn to options, as most have been doing so far.

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