In 2008 Iran celebrated the centennial of the first discovery of oil at Masjed-e-Suleiman situated in the southwestern foothills of the Zagros Mountains. The 100-year old history of the Iranian oil industry has been extensively chronicled by many authors\(^1\) and it is a fascinating tale of a nation struggling initially to obtain its rightful and contractual royalty and share of the income from a concessionary regime, and later, to win control of an industry that is the lifeblood of its economy. It, therefore, twists and turns through the cancellation of the concession agreement with the Anglo-Persian Oil Company in 1933, enters into another agreement with the same concessionaire on different terms and, eventually opts for nationalization in 1951 when a wave of nationalistic sentiments demands it and at a time when the concessionaire fails to offer Iran terms that had become the norm in the industry.

Once the dust settled, Iran found itself forced by events to agree to another quasi-concession type contract that left all controls in the hands of the Consortium—a group consisting of all major international oil companies and several independents. Never forgetting the dream, it set itself the task of learning by practice the intricacies of the industry with the hope of one day managing all its facets. And so in the process, it pioneered the so-called 75/25 joint-venture type agreements and then moved to Agency and later Risk Service Contracts. And eventually, in an opportune moment, it wrested control and management of its major oil operations from the Consortium. By 1974, the process is completed when the decision-making power, especially in setting production levels and prices, shifted completely from the international oil companies to the members of the Organization of Petroleum Exporting Countries (OPEC).

A pre-revolutionary snapshot of the Iranian petroleum industry

The revolutionary turmoil that started in mid-1978 had a paralyzing effect on the oil and gas industry of Iran, especially during the fourth quarter. Strikes by the employees of the industry brought the production of crude oil and all refining operations to a standstill, thus interrupting supplies of products to the domestic market and all export operations. These stoppages also affected the export of natural gas to the former Soviet Union and the fledgling domestic gas industry.
A picture of the Iranian oil and gas industry during the period 1973–78 can be gleaned from the data shown in Table 19.1. Throughout this period, close to 90% of total crude oil output came from onshore fields under the management of National Iranian Oil Company (NIOC) and the remaining 10% was produced by four joint venture companies operating in the offshore region of the Persian Gulf.2

Onshore crude oil production came mainly from four giant oilfields (Aghajari, Gachsaran, Ahwaz and Marun) which accounted for a combined output of around 4mbpd. A second tier group of four large fields (Bibi Hakimeh, Karanj, Parsi and Rag-e-Sefid) produced nearly 1mbpd combined and the other 20 or so oilfields produced the remaining 0.5mbpd. Declining reservoir pressure, especially in the older fields such as Aghajari and Gachsaran, had made it necessary to constantly add replacement capacity through drilling new producing wells; though work-over wells, desalting facilities and secondary recovery (artificial lift systems, water and gas injection) projects also provided significant volumes. In the offshore region of the Persian Gulf, crude oil production had begun an upward trend and was planned to reach some 0.8mbpd by the end of the decade through the expansion of IPAC’s output and the start of production at SIRRI C and D oilfields.

Prior to 1970, gas consumption in Iran was limited to some small usages in the southern oilfields and further quantities that were pipelined to the city of Shiraz for a fertilizer plant and other industrial units. After 1970, however, many factors contributed to the rapid entry of gas into the energy consumption picture. To begin with, the export trunkline to the former Soviet Union had a built-in excess capacity of 7bn cubic metres (bcm) for domestic market and once that pipeline became operational distribution also started in the cities along the route of the

Table 19.1  Iranian oil and gas statistics (1973–78)

<table>
<thead>
<tr>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Proven Oil Reserves  (billion barrels)</td>
<td>58</td>
<td>60</td>
<td>62</td>
<td>63</td>
<td>63</td>
<td>60</td>
</tr>
<tr>
<td>Proven Gas Reserves  (billion cubic metres (bcm))</td>
<td>7,647</td>
<td>9,346</td>
<td>9,332</td>
<td>9,346</td>
<td>14,160</td>
<td>14,160</td>
</tr>
<tr>
<td>Crude Oil Production (thousand barrels per day) (kb/d)</td>
<td>5,861</td>
<td>6,022</td>
<td>5,350</td>
<td>5,883</td>
<td>5,663</td>
<td>5,242</td>
</tr>
<tr>
<td>Export of Crude Oil (kb/d)</td>
<td>5,277</td>
<td>5,369</td>
<td>4,671</td>
<td>5,214</td>
<td>4,867</td>
<td>4,447</td>
</tr>
<tr>
<td>Cumulative Production of Crude Oil (billion barrels)</td>
<td>18.0</td>
<td>20.2</td>
<td>22.1</td>
<td>24.3</td>
<td>26.4</td>
<td>28.3</td>
</tr>
<tr>
<td>Gas Production (bcm)</td>
<td>48.2</td>
<td>50.0</td>
<td>45.4</td>
<td>50.7</td>
<td>56.7</td>
<td>55.1</td>
</tr>
<tr>
<td>Gas Exports (bcm)</td>
<td>8.7</td>
<td>9.1</td>
<td>9.6</td>
<td>9.3</td>
<td>9.3</td>
<td>7.2</td>
</tr>
<tr>
<td>Gas Rejection (bcm)</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Flared (bcm)</td>
<td>28.4</td>
<td>27.7</td>
<td>23.6</td>
<td>27.9</td>
<td>26.4</td>
<td>25.8</td>
</tr>
<tr>
<td>Domestic Consumption (bcm)</td>
<td>11.0</td>
<td>13.2</td>
<td>12.7</td>
<td>12.6</td>
<td>11.7</td>
<td>12.2</td>
</tr>
<tr>
<td>Active Rigs</td>
<td>26</td>
<td>34</td>
<td>45</td>
<td>45</td>
<td>46</td>
<td>50</td>
</tr>
<tr>
<td>Wells Completed</td>
<td>74</td>
<td>94</td>
<td>153</td>
<td>146</td>
<td>165</td>
<td>140</td>
</tr>
<tr>
<td>Producing Wells</td>
<td>378</td>
<td>380</td>
<td>395</td>
<td>500</td>
<td>533</td>
<td>551</td>
</tr>
<tr>
<td>Refining Capacity (thousand barrels per day) (kb/d)</td>
<td>660</td>
<td>690</td>
<td>810</td>
<td>810</td>
<td>1,050</td>
<td>1,080</td>
</tr>
<tr>
<td>Product Output (kb/d)</td>
<td>555</td>
<td>592</td>
<td>644</td>
<td>652</td>
<td>725</td>
<td>670</td>
</tr>
<tr>
<td>Domestic Consumption (kb/d)</td>
<td>259</td>
<td>296</td>
<td>352</td>
<td>431</td>
<td>511</td>
<td>517</td>
</tr>
<tr>
<td>Export of Products (kb/d)</td>
<td>295</td>
<td>295</td>
<td>313</td>
<td>216</td>
<td>208</td>
<td>188</td>
</tr>
</tbody>
</table>

pipeline, notably in Tehran. In addition, the discovery of gas resources at Khangiran, a field located in north eastern border areas with Turkmenistan, made it possible to supply gas to the city of Mashhad while more of the associated gas and gas liquids in the southern oilfields were being supplied to the fertilizer and petrochemical industries and the Abadan refinery. More importantly, starting at the end of 1976, nearly 10bcm of gas was being re-injected annually into three oilfields (Haftkel, Gachsaran and Lab-e-Sefid).

Planning and policy in the pre-revolutionary years

The Iranian pre-revolution Fifth Economic and Social Development Plan (1973–78) was prepared at a time when the world’s petroleum consumption was rising at an average annual rate of 7% and OPEC members had already won a significant victory in February of 1971 whereby the two sides had signed a 5-year agreement for an immediate increase of around 21% in the posted price of Persian Gulf crude oils, and other annual increases thereafter including one to compensate for inflation and the fall in the purchasing power of the Dollar. The overarching policy in the Plan aimed at speeding up exploration programmes in order to replace reserves that were being depleted at a rate in excess of 2bn barrels per year and using secondary recovery and conservation techniques to enhance ultimate recovery from the Iranian reservoirs. Furthermore, the Plan called on NIOC to penetrate the international markets directly by selling its share of crude oil from the joint venture operations and by participating in refining, marketing, distribution and sales operations abroad. The National Iranian Gas Company (NIGC) was also called on to enter into contracts with international firms for the export of LNG to supplement export of piped gas to the former Soviet Union. There were, of course, the customary boiler-plate objectives of supplying the domestic needs of a fast growing economy with petroleum products and enhancing the refining sector economics through substitution of natural gas for middle distillate products. Policy, therefore, called for the rapid expansion of natural gas network domestically.

The year 1971 proved to be a pivotal one in the relationship between the international oil companies and the producing countries. A few months after the signing of the Tehran Agreement, OPEC passed its 135th Resolution to the effect that “member countries shall take immediate steps towards the effective implementation of the principle of Participation in the existing oil concessions.” This started a flurry of negotiations that, in short order, resulted in the transfer of control to the producing countries by the end of 1973. This was achieved through nationalization in Libya, Algeria and Iraq; participation in all Arab countries of the Middle East and by simple abrogation of some of the companies’ key contractual rights elsewhere.

In Iran, however, since the oil industry had already been nationalized in 1951, the passing of control meant the wholesale replacement of the Consortium Agreement by a new contract entitled the Sale and Purchase Agreement for a duration of 20 years. The agreement provided for NIOC to exercise the right of full and complete ownership, operation management and control in respect of all hydrocarbon resources, assets and administration of petroleum industry in the Agreement Area. Other clauses provided for the complete transfer of Abadan Refinery management to NIOC and the formation of a non-profit service company by the Consortium, incorporated in Iran and named Oil Services Company of Iran (OSCO) to carry out services as assigned to it by NIOC in the southern oilfields. Furthermore, NIOC accepted to shoulder the investment required for the expansion of production (with special arrangements for the first five years) and committed itself to take stated quantities of crude oil each year for export starting at 200,000 barrels per day in 1973 and increasing to 1.5mbpd by 1981. The agreement also
provided for a new regime for gas utilization whereby NIOC’s requirements for reinjection, internal consumption and pipeline exports were given preferential status with the remaining available for sale to the Consortium.

With the operational management and control secured, NIOC did not waste any time in embarking on a set of comprehensive and far-reaching policies which had not, hitherto, received the enthusiastic support of the Consortium, though they were strongly recommended by the Plan such as enhanced exploration and drilling activities for the discovery and delineation of crude oil and gas reserves in the Agreement area; and implementation of a comprehensive scheme for conservation and gas reinjection into the oilfield for enhanced recovery. Thus, based on the prevailing forecast for global demand, NIOC directed OSCO to aim at reaching a production capacity of some 7.5mbpd by 1975, thereby increasing the combined onshore and offshore capacity to around 8mbpd. In the process, the flaring of associated gas was also expected to stop by 1978.

In practice, as OPEC production stagnated at about the 1973 level of 30.6mbpd, the average annual demand for Iranian crude oil from the Southern Agreement Area never exceeded 5.6mbpd and the crude oil capacity never went much beyond 6mbpd. The intensive exploratory and drilling activities, however, resulted in some two dozen new oil and gas field discoveries, a few of which such as Dehluran and Chillingar were quickly brought on stream.

By 1978 the overambitious plans of the early 1970s had somewhat been tempered by the escalation of costs, the changes in the global energy picture and the demand for OPEC oil. While the emphasis remained on resource development, conservation and enhanced recovery, the production capacity target was reduced to a plateau of 7mbpd—onshore 6.25mbpd and offshore 0.75mbpd—to be maintained for an extended period through additional drilling and recovery techniques and gas reinjection. Thus the Plan for the following five years (1979–83) called for the drilling of some 280 oil, gas, and reinjection wells; and the injection of gas into some 14 large and medium-sized oilfields (Bibi-Hakimeh, Binak, Dehluran, Gachsaran, Haftkel, Karanj, Kuh-e-kaki, Kupal, Lab-e-Sefid, Marun, Parsi, Qaleh Nar, Ramshir and Sarkan) at a rate of 33bcm in 1979 and building up to 66.5bcm in 1983 (Table 19.2). This reinjection plan was to be expanded to Ahwaz, Aghajari and Rag-e-Sefid in later years for a total annual injection rate of 92bcm. NIOC’s brief also included the expansion of its own crude oil marketing already at a level of 1.5mbpd, and participation in upstream and downstream activities throughout the world beyond its joint exploration activity with BP in the North Sea and its shareholdings in India’s Madras, South Africa’s Sasolberg, South Korea’s Kipco and Senegal refineries. The domestic refining industry was also to expand to meet the internal demand as well as the policy of maintaining Iran’s position in the international markets.

Table 19.2 Gas Reinjection Programme in bcm/year

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<tbody>
<tr>
<td>Bibi Hakimeh</td>
<td>3rd quarter 1980</td>
<td>2.6</td>
<td>2.3</td>
<td>4.5</td>
<td>4.5</td>
<td></td>
</tr>
<tr>
<td>Gachsaran</td>
<td>2nd quarter 1977</td>
<td>17.9</td>
<td>18.2</td>
<td>18.5</td>
<td>17.0</td>
<td>17.4</td>
</tr>
<tr>
<td>Karanj</td>
<td>2nd quarter 1980</td>
<td>2.2</td>
<td>5.0</td>
<td>5.0</td>
<td>5.0</td>
<td></td>
</tr>
<tr>
<td>Marun</td>
<td>3rd quarter 1979</td>
<td>13.0</td>
<td>13.0</td>
<td>26.0</td>
<td>26.0</td>
<td>26.0</td>
</tr>
<tr>
<td>Parsi</td>
<td>1st quarter 1982</td>
<td></td>
<td>4.5</td>
<td>4.5</td>
<td>4.5</td>
<td></td>
</tr>
<tr>
<td>All Others</td>
<td>Various Dates</td>
<td>2.3</td>
<td>1.8</td>
<td>4.1</td>
<td>9.2</td>
<td>9.1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>33.2</td>
<td>37.8</td>
<td>60.4</td>
<td>66.2</td>
<td>66.5</td>
</tr>
</tbody>
</table>

Source: NIOC internal memos 1978.
only required to develop and expand distribution of gas throughout the country, it was specifically directed to go beyond the export of gas to the Soviet Union via a second Trunkline (under construction) and enter the LNG market through the implementation of the Kalingas project to Japan and the Columbia Gas project to USA. All this was to be complemented with the expansion of domestic transportation facilities via pipelines as well as maritime tanker capacity.

**The early post-revolutionary period until the end of the Iran-Iraq war**

Almost immediately after the take-over and long before the ratification of the New Constitution, the Revolutionary Government cancelled the oil exploration and production agreements ostensibly on the grounds that they did not sufficiently safeguard the interests of Iran and were imposed by the West and placed a ceiling of 4mbpd on the production of crude oil. At a later date, a dispute with the Soviet Union on the price of gas led to the annulment of the IGAT1 and IGAT2 agreements. Iran also withdrew its shareholding in the Korean, South African and Senegalese refineries. Meanwhile, articles 43 and 44 of the Constitution which was ratified in mid-1979 forbade the government to enter into agreements that led to the “foreign domination of the country’s economy” and provided for all the large enterprises (commanding heights) to remain in the hands of the government.

The events of the first two years after the revolution (the hostage crisis and the start of war with Iraq) conspired to keep the Iranian production below the announced ceiling at 3.2mbpd and 1.6mbpd in 1979 and 1980, respectively. Subsequently, the damage sustained by all the oil industry facilities onshore and offshore such as oilfields, pipelines, refineries, export terminals, etc., resulted in crude oil production remaining between 2 and 2.4mbpd throughout the eight year period before the cease-fire in 1988 (Table 19.3).

It will be remembered that during this period the price of Persian Gulf crudes initially almost tripled to US$36 per barrel ushering in several years of diminishing demand for OPEC oil and the start of pro-rationing by OPEC. Initially Saudi Arabia chose the role of the swing producer, but as discipline could not be maintained among the others and demand for OPEC oil sank to around 15mbpd and prices collapsed in 1985/86 Saudi Arabia decided to relinquish that role and opted for netback pricing forcing other members of OPEC to discard their adherence to the posted price regime and accept a policy of regaining market share.

Although the OPEC quota did not allow Iran to produce above 2.4mbpd during the period 1983 to 1988, the producing capacity at some point had, according to the NIOC’s Director of Production, dropped to a low of between 2.19mbpd and 2.15mbpd onshore and 36,000 barrels per day offshore.9 Undoubtedly, the eight-year war had inflicted serious damage on the oil facilities and much of the country’s revenue was reallocated to support the war efforts and the maintenance of capital stocks was deferred. But some of the damage to the oil producing capacity can also be traced to the period of turmoil and neglect between the Revolution in early 1979 and the start of hostilities with Iraq in September 1980. The cancellation of Consortium and other joint-venture agreements had resulted in the rapid exit of the expatriate technical specialists, the departure of many Iranian high and middle managers and the non-availability of high quality foreign technical services. The situation was exacerbated by the managerial appointments that were based on ideological and Islamic credentials rather than technical and operational knowledge with the result that much of the capacity maintenance activities such as new development drilling, work-over wells and secondary recovery projects had been all but stopped. These difficulties were compounded during the war years by the paucity of investment funds, the dearness of the national technical talent and the reluctance to
engage expatriate experts or to contract for up-to-date technical consultancy. Given Iranian reservoirs’ natural annual depletion rate of 5–7% and the reduced level of activity throughout the period up to 1988, it is not surprising that Iran’s production capacity had sunk to around 2.2mbpd at some point during the mid-1980s. As a further example of this situation, the reinjection facilities that were completed and ready for the start of gas injection into the Marun reservoir in early 1979 also remained unutilized until the end of the 1990s. Nonetheless, in 1987, NIOC increased its estimate of proven crude oil reserves to 92.85bn barrels which included some 3.26bn barrels of condensate.\(^7\)

Abadan refinery also became an early casualty of the war. The largest refinery in the world with a distillation capacity in excess of 700,000 barrels per day, it was bombarded at the beginning of the war and was shut down until the end. Thus the total refining capacity dropped to around 600,000 barrels per day in 1981, which was insufficient to satisfy the domestic demand especially for the middle distillate products. Consequently, as demand for petroleum products outpaced refinery outputs, import of middle distillates, kerosene and gasoil, and later gasoline and LPG rose to around 180,000 barrels per day by 1988.\(^8\) However, NIGC

}\n
\begin{table}[h]
\centering
\caption{Iranian oil and gas statistics (1980–88)}
\begin{tabular}{lcccccccc}
\hline
\hline
Proven Oil Reserves (billion barrels) & 58.0 & 57.0 & 56.1 & 55.2 & 58.8 & 59.0 & 92.8 & 92.8 & 92.8 \\
Proven Gas Reserves (billion cubic metres) (bcm) & 14101 & 14085 & 14069 & 14045 & 14016 & 13986 & 13955 & 13922 & 14280 \\
Crude Oil Production (thousand barrels per day) (kb/d) & 1817 & 1565 & 2421 & 2442 & 2032 & 2192 & 2037 & 2298 & 2478 \\
Export of Crude Oil (kb/d) & 797 & 715 & 1623 & 1719 & 1522 & 1568 & 1454 & 1710 & 2095 \\
Cumulative Production of Crude Oil (billion barrels) & 30.0 & 30.4 & 31.3 & 32.2 & 32.9 & 33.7 & 34.4 & 35.3 & 36.2 \\
Gas Production (bcm) & 20.1 & 16.8 & 24.5 & 29.2 & 30.5 & 31.6 & 33.3 & 36.7 & 40.5 \\
Gas Exports (bcm) & - & - & - & - & 22.2 & 25.0 & - & - & - \\
Gas Reinjection (bcm) & 2.3 & 1.9 & 2.7 & 8.5 & 70.0 & 11.0 & 12.2 & 15.0 & 15.0 \\
Flared (bcm) & 10.6 & 8.4 & 14.5 & 9.7 & 7.0 & 6.0 & 5.9 & 5.7 & 5.5 \\
Domestic Consumption (bcm) & 7.1 & 5.7 & 7.2 & 11.0 & 13.5 & 14.6 & 15.2 & 16.0 & 20.0 \\
Active Rigs & NA & NA & 11 & 14 & 16 & 18 & 17 & 18 & 18 \\
Wells Completed & 25 & NA & NA & 15 & 28 & 50 & 48 & 29 & 23 \\
Producers Wells & NA & NA & 530 & NA & 230 & 237 & 361 & 650 & 645 \\
Refining Capacity (thousand barrels per day) (kb/d) & 1320 & 670 & 670 & 670 & 615 & 615 & 615 & 615 & 615 \\
Product Output (kb/d) & 582 & 627 & 659 & 624 & 618 & 647 & 558 & 541 & 614 \\
Domestic Consumption (kb/d) & 562 & 568 & 578 & 578 & 589 & 812 & 851 & 579 & 882 \\
\hline
\end{tabular}
\end{table}

managed to expand its distribution network in the country’s northern cities and domestic gas consumption rose to 16bcm by the end of the war.

**Policy in the Islamic Republic’s first Five Year Plan (1989–93)**

The war with Iraq had wreaked havoc with the Iranian economy. With destruction and devastation in many parts of the country, GDP per capita had fallen to around 60% of its level before the Revolution. To reach a more perfect, just Islamic society, the planners emphasized two imperatives: first, the need to implement a family planning scheme to slow the growth rate of the population, which had exploded from 35.4m. in 1978 to 52.8m. in 1988; and, second, the need to grow the economy as fast as possible by putting to work the excess capacity made idle during the war years while carrying out, in line with the recommendations of the IMF and the World Bank, a policy of structural adjustment. The cornerstone of the Plan was a 55% increase in oil exports from around 1.5mbpd in 1988 to 2.3mbpd in 1993 (corresponding to a production of nearly 3.8mbpd) resulting in a total of some $82bn income from the export of crude oil, petroleum products, gas liquids and natural gas during the five years. The Plan also envisaged the rehabilitation of the Abadan refinery, the construction of a refinery at Arak with a capacity of 135,000 barrels per day and a rapid expansion of the gas distribution network in the country. Recognizing the subsidies embedded in the price of all energy products, the Plan prescribed long-term marginal cost pricing for most goods and services by the Government, so that the related enterprises would be capable of raising funds from their own cash flow for investment. The Plan Act provided for a total investment of around $27bn in the oil and gas industry.

Having secured support and financing, NIOC embarked immediately on a programme of expanded rehabilitation and reconstruction of the damaged facilities using its own equipment and technical resources together with turn-key contracts with foreign firms for drilling and other technical and engineering services, especially in the case of offshore platforms and loading terminals. This resulted in a gradual increase in the production capacity from both onshore and offshore fields. This period also coincided with a resurgence in the demand for OPEC oil from 18.8mbpd in 1988 to 24.2mbpd in 1993, along with a firming of crude oil prices which made it possible for all OPEC member countries to receive enhanced production allocations. However, since the end of the hostilities, Iraq had insisted on quota parity with Iran and by July 1990 both countries had an allocation of 3.14mbpd, while Saudi Arabia’s quota had risen to 5.38mbpd. Under the prevailing circumstances and given its limited producing capacity, Iran could do little to rebuff this challenge to its traditional ranking within OPEC. The inability to quickly ramp up production became more agonizing for Iran when, in the wake of Iraq’s invasion of Kuwait and the virtual stoppage of export from both countries, Saudi Arabia received the lion’s share of the quota reallocation in April 1991. In the event, while Saudi Arabia’s quota had increased from 5.38 to 8.03mbpd, Iran had only received a puny increase of 80,000 barrels per day raising its quota to 3.22mbpd which was commensurate with its production capability. While the Iraqi challenge had at least disappeared for a time, the reality was not lost on the Iranians that their position within OPEC and their general clout in the Middle East were being seriously threatened for as long as Iran’s producing capacity remained around 3 to 3.5mbpd or even the 4mbpd adopted as the ceiling just after the Revolution. It was, therefore, at this juncture that they changed course and decided to aim at a total capacity of 5mbpd by 1993, thereby making it possible to have a sustained production level of between 4 and 4.5mbpd from the onshore and 0.5mbpd from the offshore fields. This decision was made at a time of financial and budgetary crisis in the country and the situation forced the Ministry of Petroleum to seek...
parliamentary approval to attract foreign financing and technical assistance both of which were badly needed if the country was serious in developing its oil and gas resources on a sound basis. Nonetheless, NIOC claimed at the time that its resources were adequate to take care of the onshore development and flatly rejected rumours that the international oil companies (IOCs) would be invited to explore and develop onshore oilfields.10

Discussions had, however, started with the international oil companies (IOCs) for the rehabilitation of some of the fields already in production and the development of offshore producing and discovered oil and gas fields. These fields consisted of those already producing: Soroush, Nowruz and Bahregansar; those discovered but not yet developed: Sirri-E, Sirri-A, Balal and Hormuz structures; and the North and the South Pars gas fields. Out of these discussions gradually emerged the contours of a service type agreement called “buy-back,” which ostensibly satisfied the constitutional and ideological strictures of the Islamic Republic. This type of contract was similar in many respects to the Risk Service Agreements implemented by NIOC before the Revolution. Thus, for example, the developed field would be handed over to NIOC for operation and the foreign entity would be remunerated for the exploration and development expenditures out of the production of the field in question. But in many other respects NIOC’s financial take was inferior: for example, there was no signature bonus, the rates of return on investment were very generous, there were no real oversight by NIOC on the expenditure and the NIOC was obligated to reimburse the foreign company for exploration expenditures even if the exploratory activities did not result in commercial discoveries. NIOC had foregone all these advantages for not allowing the foreign entity to purchase a part of the output of the field in question for a maximum period of 15 years and replacing it with a commitment to reimburse the investment including a high rate of return and fees with the sale of the output for a period of 3 to 5 years and, in any case, until all its financial obligations were repaid.

There were other problems with the buy-back agreements. The IOCs found a clause that provided for a separation between the exploration and development phases of the contract particularly objectionable, because according to this clause, the foreign entity would, in the event of an oil or gas field discovery, have to compete with others that NIOC invited to bid for the development phase. NIOC, too, had denied itself an ongoing relationship that would ensure access to the latest technology during the production period, a need that it had admitted to, albeit grudgingly. Given the inherent complications of the buy-back type agreement and even though none of the fields under negotiations required any exploratory investments, no contract had been concluded by the end of the First Plan in 1993. NIOC had, however, issued a letter of intent in September 1992 to a consortium led by TPL (Technologie Progetti Lavori) and Saipem of Italy in co-operation with Mitsubishi Corporation of Japan and Machinoimport of Russia in respect of a $1.7bn contract for the development of the first phase of the South Pars gas and condensate field (this field is a shared reservoir straddling the median line and called the North Dome in Qatar).

Since the end of the war, further drilling and reinjection activities had allowed NIOC to reach a production capacity in excess of its OPEC quota. Although Iran no longer feared a challenge to its position from Iraq, at least for a few years, after the first Gulf War, it was intent on avoiding a repeat of what had happened at the early 1991 Conference. The petroleum minister, therefore, ordered NIOC to increase production to an average of 3.8mbpd during the whole month of October 1992. He then invited several petroleum industry reporters to Iran and presented them with the test results which were duly advertised. The minister argued that a sustained production level of 3.8mbpd signified a production capacity of some 4.2mbpd and claimed that the capacity was slated to reach 5mbpd by March of 1993.11 "These tactics went a
long way to strengthen Iran’s claim to a higher production quota and, consequently, Iran received an increase of 300,000 barrels per day compared to Saudi Arabia’s 500,000 barrels per day at the next OPEC Meeting. In practice, however, the limitations on Iran’s production capacity kept actual production well in line with the OPEC allocations, making a virtue out of necessity.

During the Plan, NIOC succeeded in constructing a 135,000 barrels per day refinery at Arak along with the rehabilitation of the Abadan refinery to a capacity of 230,000 barrels per day. These refineries helped supply the needs of the country for petroleum products which grew at an average annual rate of around 6%. With more gas replacing middle distillates, imports of these products and gasoline dropped to 124,000 barrels per day by the end of the Plan. The commissioning of a gas treatment plant at Pazanan oil and gas field, which was ready to go on stream in 1979, made more gas available for reinjection, albeit at a rate far below that envisaged in the original reinjection plans. As for the projected gradual increase in petroleum product prices for domestic consumption, little was achieved. Despite repeated attempts by the Government to increase prices annually at the time of budget debate, the price of gasoline remained untouched and there was only one increase in the price of the other major products in the third year of the Plan.

Petroleum policy during the second Five Year Plan (1994–99)

Having run into a serious financial crisis towards the end of the first Plan, the Iranian government opted for a more measured average annual GDP growth of 6% during the second Plan, along with a set of policies aimed at reducing the economic imbalances and at increasing efficiency. This was particularly relevant to the energy sector in that the government, for the first time, recognized the comparatively high energy-intensive nature of the economy the subsidies that were at the heart of that problem. There was also an explicit acknowledgement to the effect that, left unchecked, this profligacy could reduce Iran’s petroleum export capability with its attendant problems. The Plan, therefore, recommended a set of policies which addressed all the issues in the oil and gas industry in a comprehensive manner and included:

1. the maintenance of Iran’s position in the global oil markets through the diversification of energy supply to the domestic economy by expansion of the natural gas network and development of nuclear, renewable and hydroelectric power sources;
2. the reduction in the annual rate of growth of energy consumption to that of GDP through reform in energy pricing;
3. the conservation of petroleum resources through expanded injection of gas into oilfields and reduction of gas flaring;
4. the exploitation of the oil and gas fields located on Iran’s territorial and offshore boundaries shared with neighbouring countries and rapid development of offshore fields;
5. the construction of new gas treatment plants, commensurate with the production of associate and dome gas, and rehabilitation of refineries with the latest technologies to reduce loss and in-plant fuel consumption;
6. the construction of a new refinery at Bandar Abbas with a capacity of 230,000 barrels per day;
7. the expansion of exploration activities with the objective of discovering new oil and gas resources;
8. studying the advisability of natural gas exports given Iran’s medium- and long-term need for gas as a source of energy and a base for energy-intensive industries; and,
9. to be mindful of environmental issues in all such developments.12

270
The Plan envisaged a constant level of oil production at 4.5mbpd throughout the period with around 1.4mbpd dedicated for domestic consumption and 3.1mbpd destined for exports. To sustain crude production at this level, NIOC aimed at investing $20.4bn from the Government budget allocations and $9bn from foreign resources in the oil and gas sectors. This targeted production level was obviously unrealistic given the actual production of around 3.4mbpd in 1993 and a projected two to three year period of stagnant demand for OPEC oil.

Prior to the beginning of the second Plan, the Iranian government had already accepted the need for financial and technical assistance from foreign companies in the development of its oil and gas resources both in the onshore and offshore regions of the country, though priority was given initially to the offshore. By the beginning of 1994 it was becoming clear that reaching buy-back agreements with IOCs on the terms offered by Iran had proved very difficult. Thus, in January 1994, NIOC formally cancelled the letter of intent that it had issued two years earlier to a consortium led by TPL of Italy for the development of the first phase of South Pars gas field, because the foreign entities involved in those negotiations failed to agree to a suitable financial package. Unable to find any other interested foreign company, the project was later entrusted to Petroleum Engineering and Development Company (PEDEC), a subsidiary of NIOC. In the same month, the managing director of the Iranian Offshore Oil Company (IOOC) speaking at the second Middle East Petroleum and Gas Conference at Bahrain announced that, despite some western countries’ efforts aimed at isolating Iran and blocking finance, NIOC was currently continuing its negotiations with the IOCs in respect of Sirri A, Sirri E, Balal, Hengam, North Pars and South Pars projects. He further indicated that according to a recently enacted law, work representing at least 30% of the value of major contracts such as those related to the development of the South Pars gas field should be awarded to Iranian sub-contractors.13

Throughout 1994, NIOC strived to keep its sustainable capacity at around 3.8mbpd without much help from foreign partners. This meant an onshore sustainable rate of 3.35mbpd together with an offshore rate of 0.45mbpd. The buy-back contract negotiations, however, continued as Iran reluctantly decided to partially overcome the unwillingness of the IOCs by offering them an acceptable return on investment. One such deal came to fruition with Conoco in March 1995 for the development of the two Sirri oil fields. This project was particularly attractive to Conoco because, in addition to producing 120,000 barrels per day of oil, it would also produce a substantial volume of gas which had a ready market in the neighbouring Emirate of Dubai for an enhanced recovery injection scheme that was being operated by Conoco. A week later, Conoco was forced to withdraw from this contract when the US President issued an executive order banning investment in Iran’s energy sector. This order was followed two months later by another banning US trade and investment in Iran.

Immediately after the issue of the Second Executive Order, the Iranian petroleum minister again ordered NIOC to run a week-long test of Iran’s sustainable oil production capacity at 4.1mbpd. This coincided with a field trip by an invited group of journalists. Then, in a wide-ranging interview with the journalists, while regretting the break-up of the Conoco deal, he went on to emphasize: a) that “technically speaking, NIOC did not have any problem in respect of its various operations” and “did not need foreign companies to develop its oilfields”; b) that negotiations about the development of the Sirri oilfields were continuing with other IOCs and the results would be announced shortly; c) that Iran would obviously insist on a higher quota allocation from OPEC at the next occasion; and, d) that other OPEC members were on notice not to take advantage of Iran’s predicament in respect of US sanctions on oil purchases by American companies.14 In discussing the sustainable producing capacity, the
Farrokh Najmabadi

minister admitted that productivity of certain fields such as Parsi and Karanj had dropped precipitously and that continued production without gas injection might cause irreparable damage.

Hardly two months had passed when in July 1995 a buy-back contract was accorded by NIOC to France’s Total for the development of the two Sirri fields for a combined total production of 120,000 barrels per day to come on stream within less than three years. A month later, NIOC received approval from the Parliament to announce a tender for 10 projects: four for development of offshore oil and gas production (Soroush, Balal, South Pars phase 2 and Khuff gas reservoir in the Salman field); two for refinery construction and expansion (a condensate refinery and expansion of Shiraz refinery); and, four for gas gathering and treatment plants. This announcement, coming on the heels of the buy-back contract with Total set in motion a flurry of activities in the US Congress which resulted in the passage of the Iran-Libya Sanctions Act (ILSA) signed into law on 5 August 1996. This law required the President of the USA to impose at least two out of a menu of six sanctions on foreign companies that made an investment of more than $20m. in one year in Iran’s energy sector. With US pressure mounting, the initial somewhat enthusiastic response to the 10-project tender began to wane throughout 1996 and, despite NIOC’s efforts in improving the financial terms of the buy-back model contracts, no new agreements were reached for nearly two years, although the negotiations were not completely broken off.

In June 1997, with the election of Mohammad Khatami as President, a new administration came into office in Iran on a platform of economic reform and the rule of law. Three months later, in a clear rebuff to the US extraterritoriality sanctions for a second time, France’s Total signed a ground-breaking contract with NIOC for the development of phases 2 and 3 of the huge South Pars gas field. According to the information published in petroleum journals, the total capital investment amounted to $2bn to be expended in five years building a facility, offshore and onshore, capable of producing and treating 20bcm of gas and 80,000 barrels per day of condensate. Partial production of the system was to start in mid-2001 with full capacity reached a year later. Total would be compensated for its financial commitments and services by a remuneration fee of $1.4bn in addition to the associated interest charges estimated at $600m. The contract envisaged a seven-year repayment period for the investment and interest charges and five-and-a-half years for the remuneration fee. In trying to clinch this deal, NIOC had introduced two new features that were outside the initial buy-back model: 1) it agreed to maintain the level of remuneration fee if the project were completed under budget; and, 2) it agreed to tap into alternative oil sources should the quantity of condensate be insufficient to support the repayment schedule. In defending this bold move, the head of Total explained that, as a major entity on the international petroleum scene, Total needed to sustain its portfolio through involvement in Iran, a world player possessing some 10% of global oil reserves and 20% of the global gas reserves. This contract was immediately farmed out to Russia’s Gazprom and Malaysia’s Petronas, each receiving 30% of the shareholding.15

Encouraged by the momentum created as the result of the Total contract, the petroleum minister embarked on a revision of policy and new course of action. By November 1997, he announced that not only would foreign companies soon be invited to participate in the onshore oilfield remedial and enhanced recovery projects, but that onshore areas would also be opened for exploration and development to foreign participants.16 Furthermore, NIOC indicated that the enhanced features of the buy-back contract signed with Total would henceforth become an integral part of the future contracts. These policy changes were hastened by the deterioration in the international oil market and the rapid decline of prices, following an erroneous decision by OPEC to increase output by 10% at the time of the Asian financial crisis.
Suddenly, Iran’s ability to finance oil industry projects was curtailed as the specter of US sanctions and the unfavourable international atmosphere still loomed large. Facing strong opposition to its unilateral and extraterritorial action, the US government found it necessary to waive ILSA sanctions on European companies in May 1998. Two months later, NIOC offered 42 projects (16 onshore and offshore exploration and development; 15 onshore rehabilitation, enhanced oil recovery and new oil and gas field development; 7 offshore oil and gas fields; and, 4 to upgrade and expand the Abadan refinery) for international bidding which was received with enthusiasm by many foreign firms.17

It took another year before three buy-back contracts were signed by NIOC in quick succession. Thus, in March 1999, France’s ELF joined forces with ENI of Italy on a 55%:45% shareholding basis to sign a contract with NIOC for the enhanced recovery and rehabilitation of the Doroud field, a reservoir situated under Kharg island in the Persian Gulf. This project that required an investment of $540m. would increase production of oil from 150,000 to 220,000 barrels per day through the drilling of more wells and the injection of gas and water into the reservoir. The investors were to be repaid a total of $1bn during a period of 9 years from the start of additional production. The second contract was signed for the development of the Balal field with the Canadian Bow Valley and France’s ELF in April 1999. This was a fairly small discovered but undeveloped oilfield near Lavan Island requiring around $169m. for a production of 40,000 barrels per day by the year 2002. In November 1999, Shell became the signatory to a third agreement for an enhanced recovery scheme in the Souroush and Nowruz fields, in order to increase production from 50,000 barrels per day to a combined 190,000 barrels per day through the drilling of new wells and gas and water injection. The investment was estimated at $800m. and Shell would be compensated for a total of $1,455m. through off-take of oil for a period of 10 years from the start of additional production.

The lack of success in finalizing many buy-back contracts dealing with rehabilitation and enhanced oil recovery until 1999, coupled with little advance in gas injection quantities and the shortages in investment funds resulting from the oil price collapse to around $11 per barrel in 1998 hindered Iran in reaching its objective of producing an average of 4.5mbpd and reaching a capacity of 5mbpd. Nonetheless, Iran managed to maintain its capacity at around 4mbpd, to produce an average of nearly 3.6mbpd and to export 2.5mbpd during the Plan, very much in line with Iran’s OPEC quota. On other issues, however, Iran managed to put in place many of its policies in the oil and gas sectors and realize much of its objectives during the second Plan. To begin with, consistent and bold increases in the price of petroleum and other energy products (both in nominal and real terms) along with a rapid increase in natural gas distribution, dampened demand for petroleum products keeping its annual rate of growth to around 1–2%. The completion of the Bandar Abbas refinery and its coming on stream in mid-1997 combined with the expansion of Abadan refinery’s capacity to 350,000 barrels per day resulted in a sharp drop in import of white products to 33,000 barrels per day by 1999 while exports of petroleum products, mainly fuel oil and some middle distillates had risen to 376,000 barrels per day. As noted earlier, average annual gas consumption increased sharply from 37bcm in 1994 to 57bcm in 1999, though the annual rate of gas injection into the oilfields rose only marginally, from 15bcm to 18bcm during the same period.

The second post-revolutionary, socio-economic plan of the Islamic Republic coincided with the adoption of a serious containment policy by the USA vis à vis Iran, including the passage of the ILSA. Opposition was voiced to any talk of the Iranian territory being used for the pipeline transit of oil or gas from the Central Asian Republics or Azerbaijan. Despite political pressures on the countries of the region, Iran and Kazakhstan agreed on a swap arrangement whereby Kazakh oil would be delivered to an Iranian port on the Caspian Sea to be used in
internal refineries for a similar quantity exported from the southern terminals for Kazakh accounts. This arrangement was later joined by Turkmenistan. In addition, Iran started importing Turkmen gas to supplement its gas distribution to the northeastern provinces as from 1997. Towards the end of this decade, while sanctions and political pressures remained intact, a certain change of tone and rhetoric by the US Administration became discernible when import restrictions on some Iranian traditional exports to the USA were lifted and a halting dialogue started through the back channels.

**Petroleum policies during the third Five Year Plan (2000–2005)**

Iran entered the 21st century on a wave of optimism. Demand for OPEC oil was on the rise and oil prices had rebounded from their lows during 1998. It seemed that, despite its drawbacks, the buy-back model was receiving grudging acceptance by the IOCs. Amongst the four major petroleum exporters of the Middle East (Iran, Saudi Arabia, Kuwait and Iraq) Iran was the only country offering acreages for exploration and development that made it possible for the IOCs to have a semblance of access to some quantities of crude oil or condensate and gas. Since 1998 ILSA had become ineffectual, at least for the European companies as Iran’s international isolation appeared to be on the mend. The third Five Year Plan document attested to a realism hitherto absent from the Islamic Republic’s pronouncements. None other than the President of the Republic himself was on record to say that “the economy was sick.”  

The Plan had set out to reduce the size and increase the efficiency of the bloated government through wholesale reforms. It called for the adoption of policies in order to provide incentives for the private sector to reengage with the economic activities of the country. It also called for measures to rout our monopolies and to increase competition through extensive privatization of state entities and considerably increased foreign investment. In the oil and gas sector, it prescribed not only more reliance on foreign financial and technical assistance in all phases, but permitted both Iranian and foreign private sectors to enter into down-stream operations such as refining and product distribution while calling for measures that would help rationalize the excessive energy consumption through demand management policies including better energy pricing. This optimism turned into euphoria when early in 2000 a majority of reformers were elected to the Iranian parliament, allegedly providing support for the government’s reform programme.

Reflecting this new mood, Iranian Petroleum Industry representatives expounded on their plans at the Iranian Oil, Gas and Petrochemical Forum held in London in July 2000. The Forum was told that given the forecast for OPEC’s production in 2020, Iran expects to have to build its capacity to around 7.3mbpd if it wished to maintain its historical share at about 13 to 14%. In any case, Iran intended to raise its oil producing capacity to 5mbpd in the next five years and that would require the serious involvement of international oil companies in investment and technology transfer. Such assistance would be needed especially in exploration of new areas in order to add to the oil and gas reserve base of the country as well as the implementation of development and enhanced recovery projects in the existing producing fields. At that time NIOC had already awarded an exploration and development buy-back contract for Anaran Block, situated on the Iraqi border areas, to Norway’s Norsk Hydro and other buy-back contracts in advanced negotiations were: phases 4 and 5 of the South Pars gas field; development of Bangestan reservoirs in the Ahwaz, Ab Teimur and Mansouri fields; and, the development of Azadegan, Darquain and Cheshmeh Khosh oilfields. As for the refining sector, with capacity standing at around 1.34mbpd no new capacity was needed until 2005 except for some upgrading and debottlenecking, especially in the Abadan refinery.
Shortly after this forum NIOC awarded the development of phases 4 and 5 of the South Pars gas field to ENI of Italy in participation with Iranian Petropars on a 60:40 basis. The project was for an annual gas production of 20bcm together with 80,000 barrels per day of condensate. The total cost of investment plus interest and remuneration was estimated at $3.8bn to be recovered during a period of 7 to 10 years. The gas from this project which was expected to flow in 54 months was earmarked for internal consumption with nothing planned for reinjection. With no interest shown by the IOCs in the Salman field rehabilitation, NIOC decided to finance that project from its own resources and carry it out on engineering, procurement and construction (EPC) basis.

Just when some momentum was building for the conclusion of new buy-back contracts as referred to previously, a controversy erupted in the Iranian Parliament by the conservative members who claimed such contracts enabled international companies to have too much control of Iranian assets. Following this debate, the Guardian Council which has oversight power over legislation had advocated a freeze on buy-back contracts pending further deliberations. Upon referral, the Expediency Council which acts as Iran’s highest legislative court of appeal had voted in favour of continuing with the current model, effectively removing a potentially debilitating and serious obstacle, at least for a while. Around this time NIOC awarded two onshore blocks for exploration to: a) Italy’s Edison Gas for the Munir tract, which lies east-southeast of the Gachsaran oilfield; and, b) China’s SINOPEC for the Zavareh-Kashan area. These two exploration contracts were followed by a third in April 2001 with Austria’s OMV for the Mehr block which lies northwest of Ahwaz oilfield close to the Iran/Iraq border.

By mid-year, not only was the buy-back debate raging again in the Iranian Parliament, the ILSA was also well on its way to being tightened and extended. At the same time, NIOC had introduced a revision of the buy-back terms especially for the post-development operational period. It insisted that NIOC should be solely in charge of field operations once development is completed, meaning that the revenues of the IOCs would be entirely dependent on NIOC’s performance without having any chance of even recommending improvement for field management. Sensing renewed reluctance on the part of IOCs to vigorously pursue negotiations and in order to placate the critics in the Parliament, NIOC decided not to wait any longer and to develop 16 oilfields including eight buy-back projects that had been rejected by foreign companies, under standard engineering, procurement and construction (EPC) contracts, using its own resources. Shortly after this decision, NIOC finally signed an agreement with Italy’s ENI for the development of the Darquain oilfield with ENI acting as the operator in a 60:40 partnership with NIOC’s marketing subsidiary Naftiran Intertrade Company (NICO). This agreement which was for a total investment of $550m. in two phases would increase capacity initially to 50,000 barrels per day and later to 160,000 barrels per day in five years. It caused some consternation in the international petroleum community as it appeared that ENI had accepted NIOC’s new terms regarding the operational phase. The irony of this solitary act was not lost on the observers who remembered the signing of an agreement by the late Enrico Mattei with NIOC on a 75:25 basis some five decades earlier in the face of fierce opposition by the Seven Sisters.

The recurrent buy-back debate in the parliament was joined in July 2001 by the Iranian judiciary investigating allegations of corruption in allocation of buy-back contracts to IOCs by Petropars, a subsidiary of NIOC entrusted with the development of the giant South Pars gas field. Ironically, just at a time when NIOC had announced that oil producing capacity was diminishing by 300,000 barrels per day each year, and that Iran’s existing technology was inadequate to maintain the country’s current capacity at 4mbpd and, therefore, it had invited
bids from international and local consultants or joint ventures to provide management services to its Oil Production Capacity Enhancement Plan, a parliamentary commission was hard at work trying to determine whether or not the buy-back deals served the national interests and whether the job entrusted to the foreign firms could not be done by the Iranian experts.22

It should be noted that the productivity of the Iranian oil fields had already diminished considerably because the enhanced recovery plans had not been fully implemented (Table 19.4).

The landslide re-election of President Khatami did not seem to have any effect on the opposition to his reform agenda by a strong group of conservative members of the Iranian Parliament. However, following the 11 September attacks in the USA and the Iranian government’s helpfulness in Afghanistan, hopes were raised, at least for a short while, that relations between the two countries might be on a conciliatory course. Any such hopes were soon dashed when the US President took the rostrum on 29 January 2002 and stated that Iran was part of an “Axis of Evil” in his State of the Union message. The effect of this statement, though potentially devastating, was slow to come. Throughout 2002 and before the invasion of Iraq, Iran still managed to reach buy-back agreements with a few European and Asian companies which could not turn away from the lucrative business with Iran. Thus, Norway’s Statoil replaced Britain’s Enterprise Oil in negotiating for the development of phases 6, 7 and 8 of the South Pars gas field; Korea’s Lucky Goldstar (LG) joined POGC for the development of phases 9 and 10 of the South Pars gas field; rehabilitation of Masjed-e-Suleyman was awarded to Canada’s Sheer Energy Company; exploration of Farsi Block in the Persian was given to a group of Indian companies; and, development and rehabilitation of Forouzan and Esfadiar oil fields were entrusted to Petro Iran Development Company (PEDCO).

In the aftermath of Iraq’s invasion, Iran became progressively embroiled, on the one hand, with the insurgency and other events in Iraq, and on the other, with the IAEA and the major western countries on its nuclear programme and proliferation issues. The referral of Iran to the UN Security Council over its nuclear programme created serious doubts for the international companies in respect of their continued involvement in Iran. The spectre of confrontation with the USA and talk of military strikes were received with trepidation in the IOCs’ boardrooms. Consequently, even a last ditch effort by the NIOC to offer revised buy-back terms at a tender conference held in the Hague in early 2004 for 16 exploration and development licences did little to entice the international companies that were most in demand by NIOC for their up-to-date technology. These revisions were both a reversal of the previous demands as well as the giving-in to the IOCs’ demands. They included the bundling of the exploration and

| Table 19.4 Productivity of major Iranian oil fields (`000 barrels per day) |
|-----------------------------|-----------------|-----------------|-----------------|
| Aghajari                    | 634  | 278  | 270  | 200  |
| Ahwaz Asmari                | 1087 | 847  | 850  | 700  |
| Ahwaz Bangestan             | 37   | 132  | 180  | 155  |
| Bibi Hakimeh                | 220  | 149  | 150  | 130  |
| Gachsaran                   | 743  | 579  | 650  | 560  |
| Karanj                      | 252  | 196  | 225  | 150  |
| Marun                       | 1288 | 560  | 600  | 520  |
| Parsi                       | 241  | 80   | 200  | 100  |
| Rag-e Sefid                 | 149  | 165  | 160  | 190  |

Source: Internal NIOC memos; Production tests as reported in Middle East Economic Survey.
development phases under the same contract, the extension of the licence terms to as much as 25 years and the inclusion of the IOCs in the decision-making process during the operational phase.23

Just as Iran’s access to international finance and technology was slipping away the market for OPEC oil and crude oil prices were firming up. Already Iran’s revenue from the export of petroleum had increased from around $19bn in 2002 to more than $26bn in 2003 making it relatively easier for NIOC to finance some projects from its own resources. There were also talks of allocating far larger funds in the order of $100bn for the petroleum sector in the next five year plan, starting in 2005.24 In January 2004 NIOC broke off negotiations with Spain’s Cepsa and Austria’s OMV and decided to assign its subsidiary, Iranian Central Oil Fields Company (ICOFC), to undertake the Cheshmeh Khosh gas injection project. NIOC then set up a consortium of companies, consisting of BP, Statoil, Petronas, Norsk Hydro and Total, to study improved oil recovery (IOR) prospects of Iranian oilfields. As oil revenue topped $34bn in 2004 NIOC moved farther away from the European IOCs and opted for implementing projects through its own subsidiaries or awarding buy-back deals to the national firms and Asian petroleum companies. Thus, in March of 2005 (just before the end of the Iranian budget year), NIOC announced the award of buy-back contracts for three oilfield development projects to Iranian companies: Ahwaz Bangestan gas reinjection and South Pars oil layer projects went to PetroIran Development Company (PEDCO); and, Rag-e-Sefid production expansion project was contracted to Qeshm Oil and Energy Industries Development Company. This was followed shortly by two exploration buy-back awards: Saveh block to Thailand’s PTT; and, Kuhdasht to China’s CNPC. This latter had taken over the operation of the Masjed-e Suleyman oilfield redevelopment from Canada’s Sheer Energy.

Policy during the fourth Five Year Plan and the 20-year perspective

When the fourth Plan was being drafted, the burning issue was no longer the revision of buy-back terms to make that type of contract more palatable to the IOCs because the stand-off with the West had already driven the international companies away from the Iranian scene. Rather, it was the run-away consumption of energy products caused by low prices and highly energy inefficient capital and transportation stocks that received a good deal of attention. Of particular significance was the galloping imports of gasoline which was running at around 150,000 barrels per day, weighing heavily on the resources of the Treasury. The Plan, therefore, recommended the aligning of petroleum product prices with Persian Gulf wholesale export prices on the condition that the government would compensate the low income and vulnerable groups with direct assistance. The Plan also directed the government to adopt many energy saving measures such as expansion of public transportation, introduction of more energy efficient building codes, regulations requiring the manufacture of more fuel-efficient and gas-consuming vehicles, etc. The Plan further emphasized the need for privatization of downstream petroleum activities, as well as the attraction of foreign investment and technology in the oil and gas industry, including buy-back contracts.25

The period leading up to the 2005 presidential elections brought renewed tension for the oil industry. In February the parliament ratified a bill calling for a probe into the operations of the Ministry of Petroleum. The inquiry was supposed to gauge the ministry’s performance, especially its handling of the buy-back contracts between NIOC and IOCs. This was merely the continuation of the previous debate about the validity of such contracts, hampering the ministry and elevating the political risk of doing business in Iran. The election of a self-described fundamentalist was most probably the result of the people’s disillusionment with the reformist
government that had failed to implement any serious reforms and had retreated under pressure from the religious leadership and the conservatives. Mr Ahmadinejad had promised the reform of the petroleum sector, the resolution of the differences between the ministry and the Guardian Council, and “cutting off the hands of the mafias which have a grasp on our oil. … people must see their share of oil money in their daily lives.” While supporting foreign investment in Iran, he had added that he was not in agreement with the policies of privatization by selling state enterprises to reduce the budget deficit, rather he believed that privatization must aim at giving people shares and profits. He was also very clear that the development of the petroleum industry should make full use of domestic manpower, contracting and technical capabilities.

With parliament rejecting the President’s first nominee for petroleum minister, a protracted search started, during which the Parliament made it clear that in the future it expected a good deal more co-operation and transparency from the ministry and NIOC. Once the Cabinet was fully approved, the new Minister of Petroleum announced a reshuffle of the senior positions of oil, gas and petrochemical companies in January 2006. These appointments and the briefs of the respective managing directors clearly indicated that the overstretched National Iranian Oil Refining and Distribution Company (NIORDC) was to receive as much attention as NIOC and NIGC. In short, the brief for NIOC remained in improving oil and gas recovery, accelerating development of fields shared with the neighbouring countries, boosting exploration, expanding oil and gas producing capacity, and, increasing petroleum and gas exports. NIGC’s focus was to remain on expansion of urban and rural gas supply and rapid increase in the use of gas domestically in the place of liquid fuels. The brief for NIORDC, however, consisted of solving the problem of petroleum products, notably gasoline-importation by adding 1mbpd throughput capacity to the existing 1.5mbpd by expanding and optimizing existing refineries and building two new condensate and heavy crude refineries. As a step towards reconciliation with parliament and more transparency, a Petroleum Council was formed, which would be chaired by the President, and whose duties included the assessment, review and supervision of the new petroleum contracts. The minister also pledged a review of the unpopular buy-back contract model in order to safeguard the national interests while reviving interest among the IOCs in investing in the Iranian oil and gas sectors.

While the reinvigorated refining programme received considerable funding and was quickly put in motion, the possibility of enticing European or even Japanese IOCs to participate in the development of Iranian oil and gas prospects almost vanished as Iran was handed several sanctions by the UN Security Council. Towards the end of the decade, the European Union added its own sanctions to those of the USA and the Security Council. The result was that, despite its keen interest in the development of the Azadegan field, the Japanese INPEX eventually bowed out in 2006. ENI refused to continue development of the Darquain oilfield once the first phase was completed. Even Norsk Hydro (now Statoil/Hydro) which was successful in discovering two fields (Azar and Changuleh) in the Anaran block discontinued any further activities on this block in 2009. Moreover, many years of negotiations with European IOCs were aborted and the development of the giant Yadavaran field went to China’s SINOPEC in association with India’s ONGC.

In the meantime, NIOC has had somewhat more success in attracting interest in its buy-back exploration tenders. In 2006 Garmsar and Khorramabad blocks went to SINOPEC and Norsk Hydro, respectively. Later in 2008, the onshore Danan block was awarded to Petrvietnam and Italy’s Edison Gas received the exploration and development contract for the offshore Dayyer block. By NIOC’s tally, 16 new oilfields and 14 new gasfields had been discovered between 1997 and 2006 adding 12bn barrels of oil and 3 trillion cubic metres of gas to Iran’s total
reserves. Since that date many other fields such as Farzad on Farsi block explored by India’s ONGC, Kuhdasht studied by China’s CNPC, Tuson explored by Petrobras, Arvand near Abadan, and several other smaller gas and oilfields have been discovered by NIOC and its subsidiaries in the Khuzestan, Fars and western provinces.

As the Western European international companies discontinued their further involvement in Iran, especially in the development and rehabilitation of oil and gas fields, the Russian, Chinese and other East and South Asian companies moved in. Thus, the North and South Azadegan developments were eventually entrusted to China’s CNPC, after NIOC had already developed South Azadegan on an early production programme to 25,000 barrels per day by 2008. This involved a total investment of around $6bn to increase production from the two parts to nearly 420,000 barrels per day. Russia’s Gazprom took over development of the Azar oilfield in the Anaran block discovered previously by Stat/Hydro. All other oil and gas field developments, enhanced oil recovery projects, exploration activities, reinjection schemes, oil and gas pipeline constructions, refinery construction and expansion/revamping projects were carried out mostly through EPC contracts with Iranian or expatriate contractors.

The gasoline crisis

Even before the end of Khatami’s presidential term in mid-2005, the conservative parliament had stymied attempts to raise fuel prices with the result that the gains of the previous Plan period were reversed. This situation was exacerbated due to the loose fiscal and monetary policies of the populist Ahmadinejad administration which were openly criticized by most Iranian economists. By the beginning of 2007, with none of the refinery expansion/revamping still in sight, petroleum product imports were running at around 220,000 barrels per day with gasoline alone accounting for 170,000 barrels per day (Table 19.5).

Apart from being a heavy burden on the Treasury in the time of rising international prices, the country found its dependence on this magnitude of imports a strategic liability, especially since suggestions were being made in the anti-Iran circles that sanctions on the supply of gasoline to Iran should become a part and parcel of any new endeavours. Finally parliament agreed on a rationing scheme whereby the price of gasoline was raised by 25% and different groups of users were allocated different monthly entitlements according to the type of vehicle. The monthly quota for a car was, for example, set at 100 litres, with more allowed for taxis and other modes of transportation and freight carrying vehicles. These measures were implemented

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<th>Table 19.5 Petroleum Product Consumption (2001–09)</th>
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<td>2001</td>
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<td>Output (kb/d)</td>
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<td>Domestic Consumption (kb/d)</td>
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<td>Gasoline</td>
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<td>Kerosene</td>
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<td>Others</td>
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<td>Imports of Gasoline</td>
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at the end of June 2007 with the clear understanding that the government would later propose a comprehensive set of policies for dealing with the fuel subsidies that are currently estimated by the IEA at upward of $65bn.27 These reforms consisting of raising fuel prices and compensating the low income and vulnerable groups of people earning below a specified monthly figure by direct cash are being implemented on an experimental basis in four governorates with the hope that once the system is streamlined and refined, it would be implemented throughout the country.

Concluding remarks

With total hydrocarbon recoverable reserves standing at upward of 300bn barrels of oil equivalent, Iran possesses one of the largest hydrocarbon endowments in the world and has so far played an important role in supplying the global needs for energy products. Even in the last 30 years, during which the country has seemed to be stuck in a time warp, Iran has remained an active player on the international energy scene, although its enormous income of nearly $800bn from the export of hydrocarbon products since the Islamic Revolution appears to have done little in elevating its per capita income. Its nuclear research and development policies, harsh theocratic rules and human rights violations have kept it at loggerheads with many countries in the rest of the world, threatening it with further isolation and uncertainty. Iran’s petroleum sector cannot remain immune to the national and international political forces and it cannot stand as an island of good management in a sea of gross economic mismanagement. Above all, it is a forlorn hope that the Iranian hydrocarbon industry can remain independent from political influence and be run on purely commercial bases. In Iran hydrocarbon resources are nationalized and belong to the people, the income from them forms the lifeblood of the country’s economy and Iran is a steadfast member of an association of exporters bent on creating stability in the market of a substance that is historically notorious for its wild price fluctuations.

The history of planning since the Revolution, and the policy choices recommended by each Plan, attests to a keen understanding of the issues facing the energy sector and the dangers of inaction. But the regime has been incapable of facing these issues because of a tension that exists between a socially responsible economic management and a utopian view of Islamic justice. After all, it was none other than the Ayatollah Khomeini himself who, from his residence in Paris, promised the Iran nation very cheap and even free goods and services as a small token of imminent Islamic social justice. In those heady days some innocent souls were even convinced that they would soon be receiving their oil income share at the time calculated at $50 per person per month in an envelope via the mail. It, therefore, remains to be seen if the current reforms of replacing fuel subsidies with direct cash payments will eventually stick or it becomes a further populist redistribution adding to the economic woes of the country.

Making prognostications about the future of Iran’s petroleum sector is a perilous exercise. It is, however, less difficult to sketch the broad outlines of the Islamic Republic’s attitude towards the sector and the issues facing its future:

a) Iran considers its hydrocarbon exports strategic and intertwined with its national security;
b) Iran is supportive of OPEC and remains very jealous of its share of the quotas and its ranking within the organization;
c) income from the export of hydrocarbons will remain the linchpin of the Iranian economic development for decades to come and any talk of an oil-free economy can be safely dismissed;
d) theoretically, Iran is aware of the enormous wastefulness in its energy economy and would like to rationalize it, if at all possible;

e) natural gas is likely to play the dominant role in supplying the energy needs of the country in the foreseeable future, although some nuclear power and renewables will gradually enter the mix, because of global concern about climate change;

f) LNG projects appear to be a less attractive export option for Iran under the present international political circumstances. Gas availability is likely to limit pipeline exports if wasteful and escalating gas consumption is not checked.

The experience of the last thirty years, especially the post-Iran/Iraq war period tells us unmistakably that Iran’s quest to attain a sustainable production capacity of 5mbpd has been an utter failure, though the achievement of this target has been just around the corner since the beginning of the 1990s. In fact as late as the mid-1990s, the Minister of Petroleum still boasted that: “... technically speaking, NIOC does not have any problems in respect of its various operations.” But only a few years later this façade could no longer be maintained and the authorities started bemoaning the shortage of skilled manpower and technology. In a speech given at the Economics Department of the University of Tehran, a frustrated Minister of Petroleum had, with uncharacteristic candour, the following to say: “We only have 150 oil engineers in the country and we have shortcomings in science and technical fields.” More recently, the deputy managing Director of Exploration at the NIOC warned in an interview that: “presently a large percentage of the oil industry workforce at senior levels is in the process of retirement or leaving the industry ... More than 70% of exploration management, however, are about 30 years old ... these are also the same people who are mostly leaving the industry, which means the oil industry has been unable to keep its best or newest expert workforce”. Even if the international climate became somehow less hostile to Iran and sanctions are lifted, this shortage of skilled and experienced scientists, engineers and technical manpower constitutes the greatest obstacle to Iran’s quest for higher oil producing capacity. The acknowledgment of this problem, though a step in the right direction, does not offer any solution for as long as senior and middle management assignments are made on ideological credentials and technical decisions are subservient to political considerations.

Another important issue in the Iranian petroleum sector is the raging debate as to the advisability of allocating some quantities for long-term exports in the face of the country’s own need for gas, not only as an energy resource, but also for reinjection into oilfields, conversion to light and middle distillate petroleum products and as a base for high value-added industrial products such as petrochemicals and steel. However, there seems to be a consensus that beyond domestic gas distribution for energy consumption, gas reinjection into oilfields has the highest economic return. And this is where the industry’s performance has been dismal. Recalling the studies of the mid-1970s which recommended an annual injection rate of 92bcm and given the present condition of many Iranian oil reservoirs and the current rate of only 40bcm per year, it is essential that focus remain on supplying the reinjection requirements from the future South Pars streams until such time that the whole scheme is fully operational. The magnitude of Iran’s natural gas reserves is such that its presence in the international markets would not seriously diminish its resources domestic consumption and it now appears that the authorities have chosen to export via pipelines rather than through LNG.

With oil producing capacity currently standing at around 4mbpd and declining naturally at an annual rate of 300,000 barrels per day; and given the severity of other interconnected issues referred to previously such as the shortage of technical manpower and the slow rate of gas reinjection, a Herculean effort is needed to increase sustainable capacity to 5.6mbpd (the level at
which it was planned to breach at the end of the fourth Plan by 2010) in five years or 7mbpd by 2025. Iran can only hope to reach its objective of remaining an important player in the international energy scene if it succeeds in devising a suitable and inviting framework for attracting domestic and foreign investment and technology. Owing to government policy in the last 30 years, some technical, engineering, manufacturing and contracting capabilities have been created domestically in the public and private sectors, however, this resource needs to be employed effectively in order to achieve progress in projects whose delay is causing financial and economic loss. In the absence of less political and ideological interference in what is, in essence, a technical and commercial operation, and without more accountability and transparency Iran’s oil and gas sector is likely to, at best, muddle through.

Notes

2 SIRIP, IPAC, LAPCO, and IMINOCO.
8 The National Iranian Oil Refining and Distribution Company (NIORDC) website.
10 Middle East Economic Survey, 26 October 1992, Interview with Gholamreza Aghazadeh, the Iranian Minister of Petroleum, p. A2.
11 Ibid., p. a10.
29 Mehr News Agency, 23 January 2010, The Deputy Managing Director for Exploration of the NIOC, Mohsen Amirian Warns of Skill Shortage in Iran Oil Industry.
30 Middle East Economic Survey, 26 November 2001, Paper presented by Narsi Ghorban at the “Middle East Gas Resources and Opportunities” Conference.