Course of Renewal for ADCO Concession Expiring in 2014

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1. Introduction

Abu Dhabi in the United Arab Emirates (UAE) contains three major oil development and operating companies: Abu Dhabi Company for Onshore Oil Operations (ADCO – established October 1978), a company develops onshore oil fields, and Abu Dhabi Marine Operating Company (ADMA-OPCO – established 1977) and Zakum Development Company (ZADCO – established November 1977), companies develop offshore oil fields. Even before their establishment, international oil capital (oil majors[1]) had begun development of oil fields, but when independence from United Kingdom protectorate status was gained in December 1971, the Abu Dhabi National Oil Company (ADNOC – established November 1971) began capital participation. In each operating company there are a number of concession holders, including oil majors, but many concession agreements that lasted around 40-50 years are up for renewal[2] from 2010 onward. Japan's area of concern is that many Japanese oil development companies, starting with the Japan Oil Development Co., Ltd (JODCO) are participating in Abu Dhabi's offshore oil concessions, and from the viewpoint of securing our own-developed crude oil and for the safety of our fuel supply it is important to explore the movement of ADCO and the concession renewal, which is nearing its time limit.

2. ADCO Up to the Present

2-1　History of ADCO

The history of ADCO starts when the first concession contract in Abu Dhabi (then the Trucial State of Abu Dhabi) was concluded with Petroleum Development (Trucial Coast) Ltd.[3] on January 1, 1939. With the outbreak of World War II, geological exploration did not start until February 1950. The first oil field discovery leading to commercial production was

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[1] The seven companies that almost completely dominated the production of petroleum up to the 1970s were known as the Seven Sisters (Standard Oil of New Jersey [later Esso], Royal Dutch Shell, Anglo-Persian Oil [later BP], Standard Oil New York [later Mobil], Standard Oil of California [later Chevron], Gulf Oil [later Chevron], Texaco [later Chevron]) and with the addition of Compagnie Française des Pétroles (CFP – later TOTAL) were known as the Eight Majors.

[2] Following ADCO's concession limit in January 2014, ADMA-OPCO's limit is in 2018, while ZADCO has extended the concession limit to 2026 with the participation of Exxon Mobil in March 2006. In January 2011, Abu Dhabi Oil Co., Ltd. of Japan obtained a 30-year extension of its concession starting from December 2012.

[3] One of the 100% subsidiaries of Turkish Petroleum Company (established 1912: renamed to Iraq Petroleum Company in 1929) established for making inroads into the Middle East

Bab, in 1960, and export of crude oil started from the Jebel Dhana Terminal on December 14, 1963.

In 1962, the previous year, Petroleum Development (Trucial Coast) Ltd. was renamed to the Abu Dhabi Petroleum Company (ADPC) and Abu Dhabi, which joined the Organization of Petroleum Exporting Countries (OPEC) in 1967, began business participation, riding the wave of resource nationalism[4] that was gaining momentum in the oil producing countries. Specifically, with the Tehran Treaty in February 1971 and Tripoli Treaty in March, OPEC succeeded in strengthening the pricing rights of crude oil (pricing determined by discussions with the oil majors). Following this, with the Riyadh Treaty in December 1972, OPEC agreed with the international oil companies on the oil extraction business itself, to promote the transfer of rights from the oil majors to the oil producing countries. Backed by these, on January 1, 1973, ADNOC took a 25% stake in ADPC. On January 1, 1974, this was raised to 60%, and with the Emir Decree issued on October 8, 1978, it became the Abu Dhabi Company for Onshore Oil Operations (ADCO) and controlled all operations in the concession area.

During this time, discoveries of new oil fields with commercial production quantities continued, with Bu Hasa in 1962, Asab in 1965, Shah in 1966 and Sahil in 1967. There are now 10 oil fields in production: Bab, Bu Hasa, Asab, Shah and Sahil mentioned above, with Huwaila to the southwest of Bab, Al Dabbi'ya northwest of Bab, Rumaitha, Shanayel and Jarn Yaphour.

2-2 Participants and Concession Share

The current ADCO participants are ADNOC, BP, TOTAL, Shell, ExxonMobil and Partex. ADNOC participated when it was nationalized in 1973 as the national oil company, but the holdings of foreign capital reflect the concession structure of the Iraq Petroleum Company as of the year 1935. That is to say, the concession structure of the Iraq Petroleum Company then consisted of the Anglo-Persian Oil Company (now BP), CFP (now TOTAL), Anglo-Saxon Oil Company (now Royal Dutch Shell), a US-based consortium (in which Socony and Mobil are now ExxonMobil), and Partex, a privately-owned company of Calouste Gulbenkian. The share of participation in the Iraq Petroleum Company was also 23.75% for each oil major and 5% for Partex, and this share among the five companies is reflected proportionately in the 40% private concession share in ADCO.

[4] A move for independently managing and developing resources that exist in the country, based on a resolution for "Permanent Sovereignty Over Natural Resources" adopted by the UN in 1962.

Holding ratio of concession

	Iraq Petroleum Participation	ADCO Participation
Abu Dhabi National Oil Company	-	60.0%
Anglo-Persian Oil Co. (BP)	23.75%	9.5%
CFP (TOTAL)	23.75%	9.5%
Anglo-Saxon Oil Co. (RD Shell)	23.75%	9.5%
Near East Development Co. (US Consortium[*1])	23.75%	9.5%
Participation and Investment Company[*2]	5.00%	2.0%

Source: ADCO website, Petroleum Industry Structure of UAE (IEEJ, Dec. 2004)

[*1]Standard Oil of New Jersey (50%), Socony-Mobil (50%)

[*2]Private company owned by Calouste Gulbenkian Foundation

Foreign capital participation in the offshore operating company, ADMA-OPCO and ZADCO are different than those for ADCO, however, for all oil concessions in Abu Dhabi, 60% is held by ADNOC as the government stake and the remaining 40% is provided as the foreign capital stake[5].

2-3 Outline of ADCO Production and Future Development Plan

The UAE's total production of crude oil was 2.85 million bpd according to BP statistics. The breakdown of this has not been publicized, but Abu Dhabi produces the majority. Almost all has been produced by the three largest oil development and operating companies (ADCO, ADMA-OPCO and ZADCO) and production from small- to medium-sized oil fields, some of which are operated by Japanese oil development companies, is marginal. As of 2010, estimated production by operating companies is as follows:

Exported crude oil names and estimated production of operating companies (2010)

Operating Company	Exported crude oil, condensate name	Production (1,000 bpd)
ADCO	Murban	1,400
ADMA-OPCO	Lower Zakum, Umm Shaif	600

[5]The only exception is the former UDECO (Umm Al Dalkh Development Company) concession that was absorbed into the ZADCO organization in 1988, in which the ADNOC stake is 88%.

ZADCO	Upper Zakum	560
Three largest operating companies subtotal		2,560
Abu Dhabi Oil Co., Ltd (Japan)	Mubarras blend	24
United Petroleum Development Co., Ltd. (Japan)	Lower Zakum	14
JODCO (included in ADMA-OPCO/ZADCO)	Lower/Upper Zakum, Umm Shaif	-
INPEX ABK	Abu al Bukhoosh	25
UAE (Crude oil total)		2,620
Others (condensate, other emirates)	Uweinat*[1], Dubai, etc.	230
TOTAL UAE (Grand total)		2,850

(Source: Estimates made from various information magazines)

*[1]These are condensates. Other production includes Sharjah condensate and Tamama condensate.

Of the above, ADCO's current crude oil production is estimated at around 1.4 mmbpd. ADCO breaks the area down into four large areas for management.

(1) Bab oil field

ADCO's first oil field to enter commercial production has been in operation since 1960. This is the largest onshore oil field in Abu Dhabi, with its area of oil field structure covering approximately 1,200 square kilometers. Production from the oil field accounts for about 25% of the total ADCO production. It also produces gas and makes up about 75% of ADCO's gas production. There is also the Mirfa oil field, where development has not begun.

Estimated production by oil field and forecasts

(Unit: 1,000 bpd)

Oil field	Production		Remarks
	2010 estimate	2017 forecast	
Bab oil field			
Bab	336	435	Discovered 1960, Tamama layer development, water injection
Bab South West			

asset			
Bu Hasa	532	530	Discovered 1962, water, gas injection
Huwaila	28	30	
Bida Al-Quemzan	0	54	Production commenced 2012
Bab South East asset			
Asab	281	345	Discovered 1965, gas injection
Sahil	53	70	Discovered 1967, water injection
Shah	49	60	Discovered 1966, production wells added
Qusahwira	0	50	Production to commence in 2013
Mender	0	16	Production to commence in 2017
North East Bab			
Al Dabbi'ya	82	130	Drilling commenced 1982
Rumaitha	19	30	Drilling commenced 1969, CO_2 injection 2009
Shanayel	10	20	Drilling commenced 1983
Jarn Yaphour	10[6]	30	Production commenced 2009
Total	1,400	1,800	

(Source: Estimated from ADCO website and other information journals)

(2) Bab South East asset

This asset is centered on the Bu Hasa oil field, the second oil field discovered in ADCO. Bu Hasa, together with the Huwaila oil field, produces about 40% of total ADCO crude oil production. There is also the Bida Al-Quemzan oil field, planned to shoulder 3.5% of ADCO crude oil production and expected to be on-stream in 2012, and the Ruwais 2, Gazira, Dhafra and Mushash oil fields, where development has not yet begun.

(3) Bab South East asset

Centered on the Asab oil field, the third oil field to be discovered in ADCO, this consists of the Sahil oil field to the north and Shah oil field to the south, and the production share of each in the Bab - South East asset was announced as 73.4%, 13.9% and 12.9%, respectively[7]. In addition is the Qusahiwra oil field, to start production in 2013, and Zarrarah, Mender, Bu Qalla, Haliba, Riqeah and Arjan oil fields, where development has not begun.

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[6]Expected to start operations at 10,000 bpd initial production rate in 2009, according to *Diamond Gas Operations* magazine Oct 10, 2008 issue.

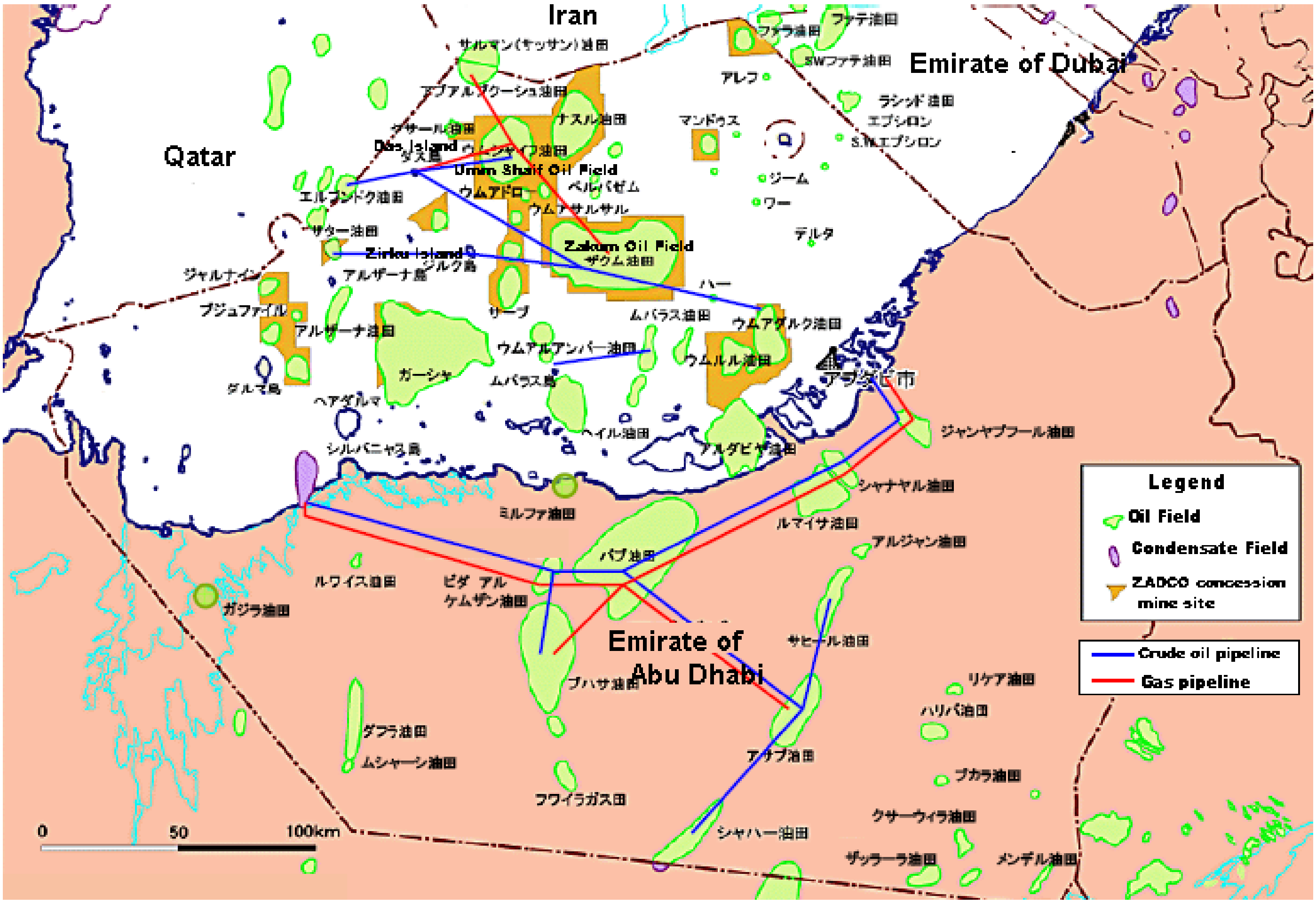
[7]Production share as indicated on ADCO website for South East Assets.

(4) North East Bab

North East Bab (NEB) consists of Al Dabbi'ya oil field, followed by the Rumaitha, Shannayel and Jarn Yaphour oil fields. These oil fields have been developed more recently than the other oil fields mentioned earlier.

ADCO currently produces 1.4 mmbpd from its 10 operating oil fields, but is now investing US$10 billion to increase this to 1.8 mmbpd in 2017. To accomplish this, both the Bida Al Quemzan oil field, planned to commence production in 2012 and Qusahwira oil field, planned to commence production in 2013, are expected to contribute to increased production. Enhanced oil recovery (EOR) methods such as water, gas and CO_2 injection are also being applied to existing oil fields. It still has many undeveloped concession mine sites and achieving the production increase has become its mission through the starting of development.

Oil distribution of Abu Dhabi



(Source) Based on JOGMEC material with additions

3. Movements of Companies and Nations Involved in the Concession, and the Situation of the Oil Producing Country

3-1 Existing Concession Holders

International oil companies participating in ADCO concessions are requesting the extension of mining rights of their existing concessions up for renewal rather than new expansions that would come at a cost. Both ExxonMobil and TOTAL are also strongly requesting a review of the current ADCO margin (determined when the crude oil price was around US$10/bbl, while the current margin is around $1/bbl)[8].

3-1-1 BP

Looking at the capital participation status of BP in Abu Dhabi's energy sector, in addition to 9.5% of ADCO's onshore oil development concession, BP participates in 14.67% of the offshore ADMA concessions, and has one-third equity in the small- to medium-sized offshore El Bunduq (BQ) oil field and a 3% stake of its concession (the sale of this stake is entrusted to United Petroleum Development, which holds the remaining 97%), and also holds 10% of Abu Dhabi Gas Liquefaction Company (ADGAS) shares[9]. In 2000, there was an opportunity to obtain the offshore ZADCO concession together with TOTAL, but ADNOC changed its plans in 2002 in view of the many international oil companies expressing their interest in ZADCO participation, and put it up for international bidding[10]. As a result, ExxonMobil, to be discussed later, was the subsequent winner.

Although it is currently suspended since the Clean Development Mechanism (CDM) from 2012 has not been finalized, BP participated in a hydrogen-based power generating plant project related to the CCS project in Masdar City from 2010 to 2011[11].

3-1-2 TOTAL

In addition to its 9.5% stake in the onshore ADCO concession, TOTAL has a 13.33% stake in the offshore ADMA concession and 75% of small- to medium-sized offshore Abu Al Bukhoosh (ABK) oil field, one-third capital participation in the Bunduq Oil Producing

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[8] *Petroleum Argus*, January 20, 2012

[9] Abu Dhabi is one of the few oil producing countries that allow upstream oil operations by foreign oil companies based on traditional oil concession agreements that grant 100% concession, in addition to operator-contract-type oil operations participated in by ADNOC. On the other hand, for natural gas sector, based on the Gas Nationalization Act promulgated in 1974, ADNOC manages the development, production and sales, and is provided with the right to operate independently or jointly with foreign capital, at its own discretion. This being the case, ADGAS, together with GASCO described later, has no gas concession.

[10] IEEJ. Petroleum Industry Structure of UAE (IEEJ, Dec. 2001)

[11] *PIW*, February 14, 2011

Company (BQ), 15% of the shares of onshore Abu Dhabi Gas Industries Ltd. (GASCO) and 5% of offshore ADGAS shares. It owns one-third of FERTIL, a fertilizer manufacturing company and has 20% equity in Al-Taweelah A-1 power generation and a desalination project of IWPP.

Since July 2007, TOTAL is also a participant and shareholder[12] in the natural gas import project (pipeline capacity: 3.2 billion cfd, i.e., approximately 33 billion m^3/year) operated by Dolphin Energy Limited (DEL). (The largest shareholder is Mubadala Development, the national investment company of Abu Dhabi, with 51%, with TOTAL and Occidental holding 24.5% each.)

TOTAL sold off 48.83% of its shares of CEPSA, a Spanish oil company owned by TOTAL, to Abu Dhabi's International Petroleum Investment Company (IPIC) on August 2, 2011, and is involved in the de-facto control of CEPSA by IPIC[13].

3-1-3 Shell

Shell only owns 15% of the onshore GASCO shares, in addition to its onshore ADCO concession of 9.5%. Compared with other international oil companies, Shell's activities in Abu Dhabi are not quite as vigorous. In the Bab sour gas project being promoted by ADNOC, as of May 2012, BP, TOTAL, ExxonMobil, Chevron, South Korea's KNOC and others have been invited to bid, but Shell, together with ConocoPhillips, which pulled out of the Shah gas field development project, described later, has not been invited to bid[14].

3-1-4 ExxonMobil

In addition to a 9.5% stake in the onshore ADCO concession, ExxonMobil owns 28% of the offshore ZADCO concession.

Participation in the ZADCO concession is fairly recent, with ADNOC selecting ExxonMobil as its strategic partner in March 2006, granting it 28% of the concession together with operatorship[15]. Subsequently, based on ADNOC's plans to increase production of the Upper Zakum oil field from the current 550,000 bpd to 750,000 bpd by 2015, ExxonMobil's technology to drill down to 30,000 feet (approximately 9,100 m) has been used since November 2011 to carry out the plan.

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[12] For joint operations with foreign participation, ADNOC is required to hold 51% or more of the concession. In this project, the upstream natural gas operations are conducted overseas (Qatar), so ADNOC's participation requirement clause is not applied, and Mubadala Development, a company fully owned by the Government of Abu Dhabi, owns 51% of the entire concession.

[13] As of March 2009, IPIC has acquired 47.0% of CEPSA shares, and with the purchase of TOTAL's holdings at €27/share (total €3.7 billion), it now owns more than 95% of the shares.

[14] *MEES*, May 14, 2012

[15] *MEES*, April 11, 2012

3-1-5 Partex

Partex only has a 2% share in the onshore ADCO concession and also owns 2% of onshore GASCO shares.

Partex is a company registered in Portugal by Calouste Sarkis Bulbenkian, referred to as Mr. Five Percent, and holds a 2% concession of Petroleum Development Oman (PDO) in the neighboring Sultanate of Oman.

3-2 Countries and Companies Vying for Participation

3-2-1 Movements by US Parties

Shah gas field development project

- ConocoPhillips participated in the Shah gas field development project joint venture with ADNOC in July 2009 and signed an interim agreement in July 2010. However, with a rapid increase in construction costs suspending the work, the company announced its decision to pull out of the project.
- In partner selection with ExxonMobil, Shell and Occidental (Occidental Petroleum [US]: OXY) in November 2011, as the final candidates, ADNOC selected OXY as the development company for the Shah gas field in February 2012. (The shareholding of the Al-Hosn Gas Company, the operator, is ADNOC: 60%, OXY: 40%).
- OXY plans to invest US$1 billion in 2011 in the Shah sour gas development project, and an additional US$3 billion by the start of operations in 2014. This marks a groundbreaking for sour gas (gas with high hydrogen sulfide content) development in Abu Dhabi. Its development has been slow due to its technical difficulties, and there are high expectations for the outcome with the rapid increase in future gas demand in the UAE. At the Shah gas field, 1 billion cfd (approximately 1.03 billion m^3/year) of high sulfur gas will be purified to produce 500 million cfd (approximately 5.17 billion m^3/year) of natural gas and 50,000 bpd of condensate and NGL[16].

3-2-2 China

Through official visits to Abu Dhabi by Premier Wen Jiabao in August 2009 and First Secretary Xi Jinping in October 2010, national diplomacy has begun as a national project and the following relationships are now being established.

Crude oil purchase contracts

- In July 2011, ADNOC concluded a deal to sell 200,000 bpd of crude to China National Petroleum Corp. (CNPC) from 2014 for 20 years[17].

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[16] *Petroleum Argus*, March 2, 2012

[17] *Platt's Oilgram News*, July 18, 2011

Joint survey of undeveloped concession mine sites

- On January 17, 2011, ADNOC and CNPC signed an agreement to jointly survey Abu Dhabi's undeveloped concession mine sites[18].

Construction of a pipeline to circumnavigate the Strait of Hormuz

- CNPC has been involved in construction of a crude oil pipeline from Abu Dhabi to Fujairah. (The pipeline was completed by the end of April 2012 and oil run tests are being conducted as of May.)

Construction of a crude oil terminal in Fujairah

- Petrochina is aiming at construction of a crude oil terminal with 1 million KL storage capacity with the Government of Fujairah[19].

3-2-3 South Korea

Through top-level diplomacy by its President Lee Myung-bak, South Korea, like China, is establishing relations with Abu Dhabi's energy sector.

Capacity improvement of Ruwais Refinery

- TAKREER has concluded an EPC contract amounting to US$9.6 billion to add 417,000 bpd refining capacity by the year 2014 to the current 400,000 bpd capacity of the Ruwais Refinery with the South Koreans in November 2009. Construction is now underway.

Nuclear power plant construction project

- On December 27, 2009, a South Korean consortium won a US$20.4 billion order for the construction of a 2,800 MW nuclear power plant. Construction is now underway.

Oil concessions

- South Korea's Ministry of Knowledge Economy announced on March 5, 2012 that the country had concluded a concession agreement that was agreed at the time of the meeting between the President of the United Arab Emirates (UAE) and emir of Abu Dhabi Sheik Khalifa bin Zayed Al Nahayan and South Korean President Lee during Lee's visit to Abu Dhabi in March 2011. The concession share is 60% for ADNOC, with the Korea National Oil Corporation (KNOC) taking 34% and 6% held by GS Energy. The agreement period is 30 years. South Korea will be the fifth country to participate in Abu

[18] *Argus Media*, January 18, 2012. No specific concession mine sites have been named.
[19] *Reuters*, March 23, 2011

Dhabi. The concession mine site has not been announced, but according to industry insiders it reportedly consists of three blocks – two onshore oil fields (around the Dhafra oil field and directly north of the Qusahiwira oil field) and one offshore oil field (directly north of Zakum oil field) – with an expected total deposit of 570 million barrels. Production is to start in 2014 at a maximum said to be 43,000 bpd[20].

IWPP Project

- KEPCO participated in capital in IWPP's power generation and desalination project (Shuwaihat S3) in February 2011. It is to go on stream in 2014.

Use of storage terminal

- A plan to construct a crude oil storage terminal by South Korea and lease it to the UAE to store UAE crude oil is now being promoted. In times of emergency, South Korea will receive priority.

3-2-4 Japan

Starting with the concession obtained by Abu Dhabi Oil Co., Ltd. in 1968, Japan has been obtaining concessions in sequence by United Petroleum Development Co., Ltd. and Japan Oil Development Co., Ltd. (JODCO), and unlike China or South Korea, it has succeeded in establishing a long and deep-running relationship not only in the energy sector, but also in culture and human resources development and exchange. Some of the recent relationships are as follows:

Masdar project

- In November 2008 Cosmo Oil placed an order jointly with Masdar to Mitsui Engineering and Shipbuilding for construction of a beam-down solar energy demonstration testing plant with a light concentration of 100 kilowatts. The total project cost is 1 billion yen and the demonstration test began in January 2010 and closed in March 2011.

Nuclear agreement

- The Government of Japan signed a cooperation document to support the introduction of nuclear power generation in the UAE. This will start with human resource development and legislation development to enforce prevention of nuclear proliferation and risk management. It aims at providing expertise for introduction of nuclear power generation in the UAE, whose power demand is growing, while aiming to link it with obtaining the UAE's natural resources like crude oil.

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[20] *JoongAng Daily*, March 5, 2012. *Petroleum Argus*, March 9, 2012, *PIW*, March 12, 2012, etc.

Use of storage terminal

- The Ministry of Economy, Trade and Industry (METI) reached an agreement with the Supreme Petroleum Council (SPC) of Abu Dhabi for joint storage of crude oil. ADNOC's crude oil is stored at the Kiire Terminal of the Nippon Oil Corporation (currently JX Nippon Oil & Energy Corporation) and if an emergency situation occurs wherein Japan's domestic crude oil runs low, Japan has priority for purchasing the stored crude. The amount stored is 600,000 KL and is equivalent to approximately one day of crude oil consumption for Japan.

Investment in environment-related investment funds

- In January 2010, the Nippon Oil Corporation (currently JX Nippon Oil & Energy Corporation) formed a consortium with JBIC and JODCO and announced that it would invest in the DB Masdar Clean Tech Fund, an environment-related investment fund established jointly by Masdar of Abu Dhabi and Deutsche Bank. The fund will start operations with initial capital of US$265 million, and the three companies will each invest US$25 million. The Development Bank of Japan will also invest US$15 million. The targets of the investment will be startup companies that develop new technologies in areas such as solar power generation, wind power generation, storage batteries, waste disposal, energy efficiency improvements and cutting-edge materials.

Oil concessions

- In February 2011, an agreement was reached for a 30-year renewal of the offshore UAE Abu Dhabi concession held by Abu Dhabi Oil Co., Ltd. At the same time, access to a new offshore concession mine site, the Hail oil field, was obtained in addition to the three existing oil fields, with production expected to be in the same level (24,000 bpd in 2009) as the existing oil fields. The Hail oil field is targeting production start around 2017-2018.

- Business collaboration, loan agreements

  In February 2011, JBIC and ADNOC signed a memorandum for business collaboration and a loan agreement. The ceiling of the agreement is US$3 billion, and the loan is provided to ADNOC for the purpose of securing a stable supply of crude oil from ADNOC. Further strengthening of ties with ADNOC through the conclusion of the memorandum and the loan is expected to support the moves to extend the existing concessions or obtaining of new concessions by Japanese companies, with the aim of contributing to the stable supply of energy for Japan.

IWPP project

- In February 2011, the Sumitomo Corporation, together with KEPCO, was granted a part of the business concession for the Shuweihat S3 power generation project in Abu Dhabi, and signed a long-term power sales contract with ADWEA.

Internship with the Masdar Institute of Science and Technology

- In May 2012, under support from METI, the Japan International Cooperation Center (JICE) announced it would receive five UAE national graduate school students of the Masdar Institute Science and Technology on a summer internship program. They will intern at Chiyoda Chemical Engineering and Construction, JGC Corp, Mitsubishi Heavy Industries (two students) and Toray.

3-2-5　Others

The following three companies have reportedly shown interest in acquiring ADCO concessions. Their involvement in Abu Dhabi's energy sector is briefly summarized here.

OMV

- OMV has capital participation in the petrochemical company Borealis, owned 64% by IPIC and 36% by OMV and Borouge, owned 50% by ADNOC and 50% by Borealis.

Statoil

- Interest of Statoil (Norway) in acquiring concessions in Abu Dhabi was first reported in the January 19, 2010 issue of the UAE English-language newspaper, *The National*. At one time, Statoil had a 50% stake in Borealis mentioned above, with IPIC and OMV holding 25% respectively. It concluded an MOU with ADNOC in 2008 to conduct joint studies for deep offshore gas field exploration, development and production. According to *The National* dated January 21, 2012, Statoil's experience and technology made it one of the finalists for the pilot test project of Masdar's Carbon Capture and Storage (CCS) to store carbon dioxide underground.

Wintershall

- According to the website of Wintershall (Germany), the company established its Middle East Office in Abu Dhabi on May 3, 2010 to strengthen its ties with ADNOC and to structure new businesses.

Both Statoil and Wintershall have been invited to bid for the Bab sour gas project mentioned earlier.

3-3 ADNOC

As for the oil producers, in Abu Dhabi it is structured so that ADNOC plans the oil policy, and after review and approval by the Supreme Petroleum Council (SPC), the plan is implemented by ADNOC itself or by the individual operating company under ADNOC's instructions. We will try to organize the basic measures toward oil development of ADNOC as the oil policy planner, as well as the statements made concerning the renewal of ADCO concessions.

Basic policy of ADNOC toward oil development

ADNOC is seeking to increase production of crude oil and some time ago was targeting 3.77 mmbpd by the end of 2012. However, it revised its plans downward and as of March 2009, the production target was 3.5 mmbpd by the end of 2017. The global economic slump and the rapid rise in construction costs have been blamed, but moves toward increased production are picking up.

For onshore oil field development, it concluded service contracts in October 2010, which included foreign capital companies, and announced its plan to increase the current production of 1.4 mmbpd to 1.8 mmbpd by 2017 with investment of US$10 billion. To achieve this, it is now proceeding with production from new oil fields, implementing EOR on existing oil fields and starting on undeveloped concession mine sites.

For offshore oil field development, in August 2010 it planned to boost production capacity of the ADMA concession mine site at the Lower Zakum oil field from 300,000 bpd to 400,000 bpd by the second quarter of 2012, and engaged McDermott (US) to upgrade the offshore production facilities in the Lower Zakum oil field by investing US$350 million. In November 2010, ADNOC also planned improvement of production capacity for the Upper Zakum oil field at the ZADCO concession mine site from the current 550,000 bpd to 750,000 bpd by 2015, and brought in ExxonMobil's deep drilling technology for this purpose (mentioned earlier).

Top management's comments on ADCO concession renewal

On June 25, 2011, Yousef Omair bin Yousef, CEO of ADNOC and secretary general of the Supreme Petroleum Council, resigned from his posts. H.E. Abdullah Nasser Al-Suwaidi, former vice CEO, succeeded the CEO post and H.H. Dr. Juaan Salem Al-Dhaheri, chairman of the Abu Dhabi Department of Municipality Affairs, succeeded the secretary general position. H.E. Al Suwaidi inherited ADNOC's plan for increased crude oil production, but his comments concerning ADCO's concession issues have now changed from what he said immediately after being appointed CEO. Initially he believed in extension for the current concession holders, which have abundant knowledge on the structure of ADCO concession mine site[21], but in 2012 he began mentioning that the best bid in terms of both technology and price would be selected. On the other hand, H.E. Al-Suwaidi mentions that he is interested in the Asia-Pacific countries and by concluding new concession contracts with these countries he expects to establish more solid relations[22]. Proof of this can be seen in the signing of crude oil purchase and joint survey contracts with China and the concession agreement with South Korea (mentioned earlier).

H.E. Al-Suwaidi also mentioned having the ADCO concessions bid as a single package or divided up into several lots and tendered. As mentioned earlier, ADCO concession mine site is broken into four groups – Bab, Bab South West asset (Bu Hasa, Huwaila, BQ), Bab South East asset and North East Bab – and dividing can be imagined in line with these groups. As mentioned, ADNOC granted two onshore and one offshore drilling concession to the South Koreans (KNOC and GS Energy Korea) and considering that they are set to start a joint survey on undeveloped concession mine sites with CNPC (China), it is conceivable that ADCO concession mine site will be divided and new participants admitted.

3-4 SPC

Regarding the situation at SPC, as mentioned earlier, it has the role of reviewing and approving the oil policy by ADNOC, which means that without SPC's approval nothing will proceed, and that ADNOC's proposals will not be approved as is. Therefore, below is a review of cases approved by SPC as the approver of the oil policy, and the factors that could be points at issue between ADNOC and SPC.

Cases of SPC approval against ADNOC proposals

(1) In March 2006, in granting the offshore ZADCO concession to an international oil company, while ADNOC recommended BP, SPC reversed this and selected ExxonMobil. Geopolitical considerations, not just development technology, were reportedly behind the decision. The Iraq issue was present at the time and the UAE needed the military power of the US. This is reportedly why US company ExxonMobil was selected.

(2) The review of onshore GASCO shareholders, for which the concession was up for renewal in October 2008, was delayed until March 2009. The background to this was reportedly that while SPC wanted the GASCO concession to be split up, the existing

[21] Before assuming the post of CEO, H.E. Al-Suwaidi was the director of oil development division at ADNOC and judged that the experience and knowledge of existing concession holders were necessary to promote the production increase plan. According to *MEES* from January 23, 2012, he mentioned to the existing concession holders in the summer and at the end of 2011 that "he hopes ADCO's concession will be extended by SPC within 2011."

[22] *Petroleum Argus*, January 20, 2012.

concession holders ultimately renewed the concession mine site as a package, following ADNOC's intent[23].

(3) In the Shah gas field development project, ConocoPhillips announced its decision to pull out of the project in 2010, ADNOC proceeded with its partner selection with ExxonMobil, Shell and Occidental (OXY) as the final candidates. ADNOC recommended Shell for its experience in handling very sour gas, but SPC ultimately reversed this and selected OXY, which had limited experience in handling very sour gas. This is also reportedly based on the same factors as in (1) above.

Factors that could be points of issue between ADNOC and SPC

As mentioned above, there are differences observed in ADNOC's recommendations and SPC's decisions, and certain differences in thinking have been observed for the ADCO concession.

(1) While ADNOC places importance on technology for oil field development (especially for CO_2 EOR) and experience, when accepting new participants it also looks for concession agreements with countries in Asia-Pacific in consideration of future marketing, but SPC is considering to give concessions to a bidder with the lowest price, including newcomers, without being restrained by existing concession holders[24].

(2) Regarding the splitting of the ADCO concession, while ADNOC had initially thought of a package-extension approach with the existing concession holders, recent ADNOC comments hint that splitting is an option.

4. Requirements for Granting (Providing) Concessions

4-1 Oil Development and Surrounding Technological Strength

In terms of technology for oil development, since ADCO concession mine site is not deep sea offshore but a standard depth onshore concession mine site with drilling depth of around 7,500 feet (approximately 2,300-2,400 m), no special drilling technology is considered necessary.

However, to achieve the recent production increase plans, ADNOC promotes enhanced oil recovery (EOR) for existing oil fields, and in addition to the Bab, Bu Hasa and Asab oil fields where water and gas injection has already been implemented, tests for CO_2 injection began at the Rumaitha oil field in 2009 to promote effective use of resources. This is to meet

[23] As mentioned earlier, based on the Gas Nationalization Act promulgated in 1974, ADNOC must manage the development, production and sales divisions for natural gas, and foreign capital in joint operation cannot hold any gas concessions. This is considered to be why the existing shareholders were able to renew the concession as a package.

[24] *MEES*, October 10, 2011

the increasing demand for gas, on the rise as fuel for domestic power generation and desalination plants, and the supply-demand balance is currently in an import position through the import of gas from Qatar via the Dolphin pipeline. On the other hand, to maintain and increase crude oil production, natural gas is being injected back for EOR, and in the peak demand season in summer it is forced to cut back crude oil production due to shortage of gas to re-inject, which is diverted in order to provide gas to power plants, placing it in a vicious circle. CO_2 emissions are expected to increase in the future from steel mill and power plants, creating the need for CO_2 countermeasures from environmental regulations. This has led to converting thinking from gas injection to CO_2 injection.

CO_2 for injection is expected to be sourced from CO_2 emitted from Emirates Steel Industries (ESI) and from 17 power plants and industrial facilities under the plan of the Masdar project. Completion of ESI is expected around the end of 2015 or beginning of 2016, and its annual CO_2 emission is 800,000 tons (43 mmcfd). This amount of CO_2 is equivalent to replacing 27 mmcfd of natural gas. Although Masdar's plans for power plants are now behind schedule, emission of an annual five million tons of CO_2 is expected at phase 1.

Currently, concerning Masdar, which will be emitting the CO_2, no decision has been made as to who will decide the CO_2 price or who will pay for it, but it is expected that this will be included in a contract when the ADCO concession is renewed.

Considering that the technical priority of ADNOC for the ADCO concession mine site is EOR using CO_2 injection (hereinafter, CO_2 EOR), we can look at the technology of each company and their approaches toward ADNOC and Masdar.

ExxonMobil and Shell

- Both of these companies are now respectively in discussions with Masdar on a "clean energy initiative" with respect to the effective use of resources using their own CO_2 EOR technology. ExxonMobil reportedly wants to operate the oil field on its own, or together with a company without CO_2 EOR technology[25].

BP and TOTAL

- BP has its own carbon capture and storage (CCS) technology to separate and store CO_2 as well as CO_2 EOR technology, and established this as "smart water technology." This technology has been applied in Salah concession mine site, Algeria since 2004.
- TOTAL has established its own CCS technology through a coherent CCS project covering CO_2 generation, transport and injection in Rousse, France with an investment of €60 million in 2010.

[25] *MEES*, April 2, 2012

Statoil

- Statoil has CCS experience in its home country of Norway, and together with Shell it is conducting research to inject CO_2 from power plants and methanol production facilities into offshore oil and gas fields.

Maersk

- Maersk (Denmark) has been conducting research to store CO_2 at the Al-Shaheen oil field in Qatar, but has not reached the stage of CO_2 EOR.

Occidental (OXY)

- OXY, now participating in the Shah Gas field development project, is promoting a CO_2 EOR project in the US state of Texas. The Shah project produces 2,000 tons per day of CO_2 but this is not subject to injection.

Japan

- Japan Oil Development Co., Ltd. (JODCO) together with the Japan Oil, Gas and Metals National Corporation (JOGMEC) conducted CO_2 EOR research at the ZADCO concession mine site in 2000-2005. The results indicate that while crude oil production will increase with CO_2 injection, applying it to the entire ZADCO concession mine site will require a pipeline to be built to carry CO_2 from the source to the site, and the investment cost will be huge. A joint study for CO_2 EOR between JODCO and JOGMEC began in 2010 at the ADMA-OPCO concession mine site.

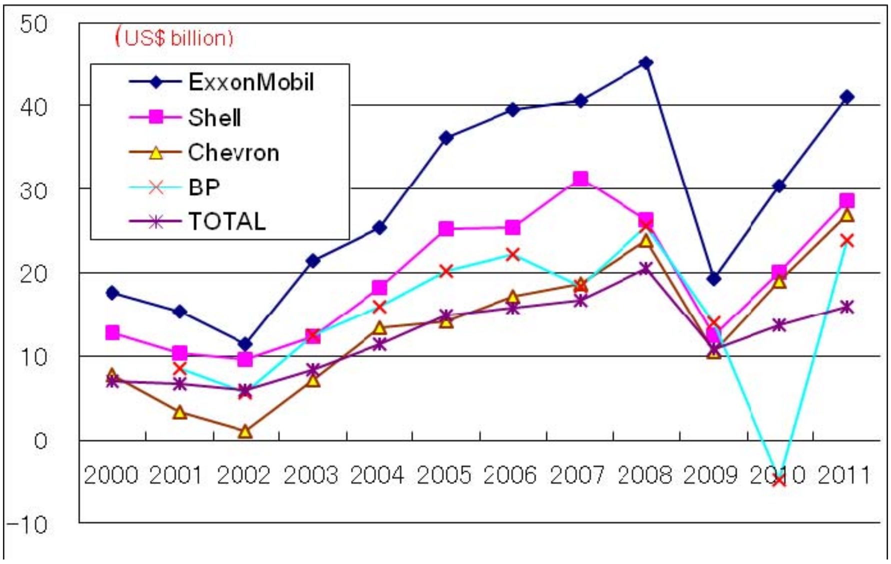
South Korea and China

Neither the South Koreans nor the Chinese have CO_2 EOR technology at the present.

4-2 Financial Strength

This section examines the financial strength of major international oil companies and other oil companies which may be candidates for the concession. It cannot be said directly that better financial strength highly correlates to winning concessions, but considering the fact that both ADNOC and SPC mention that the party with the best technology and price will win the bid, there is high possibility of companies with great financial strength being able to offer favorable prices.

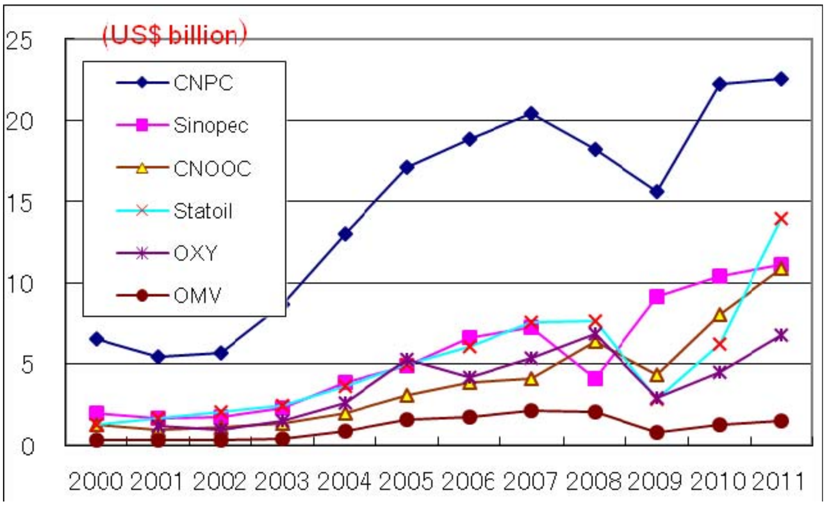
Comparison of net profits of the five Super Majors



(Source: Prepared from the annual reports of each company)

The drop in 2009 for all the companies is due to the rapid fall in the crude oil price triggered by the Lehman Brothers collapse, but since then it has recovered rapidly. The loss recorded by BP in 2010 is the result of selling off assets to pay compensation for the Gulf of Mexico oil spill.

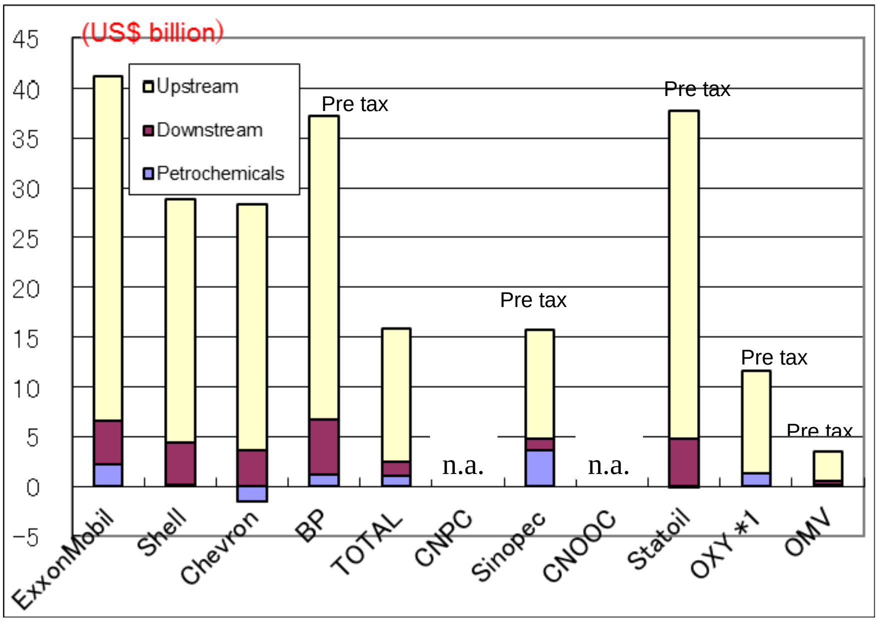
Comparison of net profits for independents and three Chinese nationally held oil companies



(Source: Prepared from the annual reports of each company)

This group also indicates the same tendency in the fall in 2009 and the later recovery, but of special interest is the growth of the China National Petroleum Corp (CNPC), which has narrowed the gap with the Super Majors. In 2011 its net profit exceeded that of TOTAL, which occupies a corner of the Super Majors. In addition, both Sinopec Corp and CNOOC Ltd. are steadily increasing their profits. Statoil also merged with Hydro Petroleum in 2007 and is growing rapidly in recent years.

Division-wise earnings comparison of the companies (2011)



(Source: Prepared from the annual reports of each company)

Since the announced figures of some companies are pre-tax and some post-tax, straight comparison of division-wise earnings of the companies cannot be made, but earnings have been made in the upstream divisions backed by a tailwind of high crude oil prices, and investment in these divisions (80%-90% of total investment) is expected to continue at the companies. Together with continued review of their asset portfolio, they will continue to participate in securing oil field concessions in promising, safe countries.

As mentioned at the start of this section, high net profits do not necessarily mean high concession-winning strength, and behind this there should exist the policies of each company, the securing of human resources that can be allocated for the ADCO concession or the priority placed in securing the ADCO concession, and the odds for winning the concession cannot be discussed. However, all the companies are aiming at expanding their earnings and participation in oil field concessions in promising, safe countries, and such results will be reflected in their commercial bids.

5. Discussion on Possibility of Japan Winning the Concession

5-1 ADNOC's Positioning of Japan's Oil Development Companies

ADNOC is said to have prequalified companies that may bid for the ADCO concession on June 11, 2012, informing them to express their intent to bid or not bid during July[26]. These prequalified companies, in addition to the existing TOTAL, Shell and ExxonMobil are reportedly Statoil (Norway), Maersk (Denmark), Inpex Corporation (Japan; JODCO is its operational company in Abu Dhabi), KNOC (South Korea), CNPC (China) and Occidental (US). It is worth noting here that both BP and Partex of the existing concession holders have not been prequalified. These companies respectively hold 9.5% and 2% of the ADCO concession, but this means that they do not have the qualification to be a concession holder in the future. The largest interest of ADNOC is maximizing earnings from the oil fields and it is clear that Partex only participates in the concession but provides no contribution. And doubts have been raised on the management capacity of BP (Gulf of Mexico oil spill of 2010, TNK-BP issue in Russia) as a company and ADNOC supposedly judged not to have BP operate its major oil concession mine sites[27]. As for which company will get the concession, it is known that at least those that were prequalified are the candidates, and Inpex (Japan) is reportedly a candidate. OMV (Austria) and Wintershall (Germany), which both had expressed interest in participating in ADCO's concession, have not been prequalified.

Regarding the selection criteria, it was mentioned earlier that the factors the oil producing countries requested were CO_2 EOR technology and financial strength. CO_2 EOR technology is currently not established in Japan, but its development is being conducted with JOGMEC at the center, and though there is a difference between offshore and onshore, the performance record of JODCO conducting CO_2 injection tests together with JOGMEC in the offshore Upper Zakum oil field would certainly be viewed quite favorably. As for operating experience in large oil fields, JODCO has experience in ADMA-OPCO and ZADCO, and ZADCO's general manager was once dispatched from JODCO. In the eyes of ADNOC, it can be said to have trustworthy technical expertise and management capabilities, including operational safety.

As for financial strength, the power of one oil development company alone is far from that of international oil companies, but with loans and debt guarantee facilities provided to Japanese oil development companies by JOGMEC, a governmental organization, the financial strength can be considered equal to those of international oil companies.

In addition, the relationship of cooperation between Japan and Abu Dhabi, both tangible and intangible, is also worthy of consideration. For more than 30 years, Japan has provided

[26] *PIW,* June 18, 2012, *MEES,* June 25, 2012
[27] *PIW,* July 7, 2012

technical cooperation and fostering of human resources to ADNOC and its subsidiaries, and recently, in January 2010, a group with JBIC at its core made capital participation in an environment-related investment fund by Masdar, and in February 2011, a business collaboration agreement and loan agreement were concluded between JBIC and ADNOC. As for guaranteeing the security of the oil producer, Japan imports approximately 30% of Abu Dhabi's production and this is certainly a positive factor from the viewpoint of ADNOC which views Asia as a purchaser of the increased crude oil production.

5-2 Movement of Americans and Europeans for Participation in Upstream Oil Operations

In the recent situation of participation in oil concession mine sites by international oil companies, the following conditions can be observed:

1) Participation in more promising oil field concessions
2) Participation in oil field concessions with higher investment cost effectiveness
3) Participation in safer oil field concessions

For example, in an international tender called at the end of May this year by the Government of Iraq for 12 oil field concession mine sites, bids were submitted only for four of them, and none of the international oil companies (majors) submitted bids. This is thought to be due to the lack of appeal in item 2 of the three above conditions. Incidentally, Inpex (Japan) won concession mine site number 10, jointly with Lukoil (Russia).

So then, where does the ADCO concession stand in light of these three conditions?

1) Promise:
   With plentiful reserves, a stable oil field in its production stage
2) Investment effectiveness:
   Rights to own crude oil produced are available as equity crude oil in proportion to the concession share
3) Safety:
   Together with its neighbor, Qatar, the political situation in Abu Dhabi is stable, unlike in many Middle East and North African countries since the Arab Spring

This makes participation in the ADCO concession a very attractive project and will probably result in fierce competition among the international oil companies to win a concession mine site.

5-3 Choices for ADNOC (assumptions)

ADNOC CEO, H.E. Al-Suwaidi recently commented, “Like the results of renewal for the GASCO concession in 2009 where ADNOC’s share was 68%, this could possibly be applied to the oil concession as well” (that is, an increase in the ADNOC concession share), but then he also said, “As a result, the most likely scenario for the renewal of the ADCO concession this time is to have ADNOC continue with its current share of 60%” (that is, maintaining of the ADNOC concession share) [28]. The remark came because ADNOC does not have the final decision, but SPC, to be mentioned later, has the power to make the final decision, meaning that as things stand now, everything (possible entry of new participants, increase or decrease in concession share, division of concession mine sites, etc.) is still unclear. However, it is inconceivable to consider a case in which ADNOC’s share in the ADCO concession would fall below 60%, so the position of ADNOC, which cannot ignore SPC’s intentions, is discussed here based on the assumption that the ADNOC concession remains at 60%.

1) Selection of new participants

It is now certain that existing participant Partex will no longer take part. BP is also said to be “still under negotiation” [29], but it would seem that its revival at this ADNOC’s prequalification stage would be difficult. So then, would it make a proposal to SPC with just the three existing concession holders, leaving the two behind? SPC is trying hard to bring in new participants and ADNOC should be well aware that it would not be able to obtain approval for the proposal if it is two companies short. This means that ADNOC would select one or two new participant candidates. ADNOC would require a new participant to have CO_2 EOR technology, which would place the Chinese and South Koreans at a disadvantage. Unfortunately, it has to be admitted that both Denmark and Japan are also in a somewhat weak position. On this point, OXY is participating in the Shah gas field development project in Abu Dhabi and promoting a CO_2 EOR project in Texas. Statoil, on the other hand, can be said to be in a favorable position, having shown rapid earnings growth in 2011, concluding an MOU with ADNOC for joint work in the exploration, development and production of deep sea offshore gas fields, and also having the technology and experience for underground storage of CO_2 (CCS) and being one the finalists for the Masdar pilot test project.

2) Setting of concession share

Considering ADCO’s concession share to be 60% ADNOC and 40% private, if there are

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[28] *Platt’s Oilgram News,* July 4, 2012

[29] *Bloomberg,* July 8, 2012

no great differences in technological or financial strengths among the private companies, common sense indicates this will be distributed equally among the parties. If, for example, it is shared among four companies, each would have 10%, or for five companies it would be 8% each. In the case of five companies, the concession share of the existing concession holders would fall from the current 9.5% to 8%, and this is believed to relate to the comments made to keep the existing concession holders in check, mentioned earlier.

3) Division of concession mine site

What would complicate matters is the concept of dividing the ADCO concession mine site, now packaged as one, into several smaller packages. If they are to be divided, it is believed the split would be into three concession mine sites – Bab, Bu Hasa (Bab South West assets) and Asab (other oil field assets) – in consideration of the production from ADMA-OPCO and ZADCO (currently 500,000-600,000 bpd, respectively). Each package would have its own concession structure and shares, but it is conceivable there would be a strategy such as having the large oil fields of Bab and Bu Hasa held by the existing concession holders with equal holding and the remaining Asab shared equally by new participants and the existing companies.

However, the crude oil produced in ADCO's concession mine site is shipped as a single type of Murban crude oil, and is not graded separately by wells, like crude oil shipped from the two offshore operating companies, and it is quite doubtful as to whether there are any advantages in dividing the concession mine site.

5-4　Approval of SPC

ADNOC is only in a position to make proposals to SPC, and the final approval of SPC will be required. SPC's interests are national security and selecting bidders with low development costs. Only the Americans and Europeans are in the former category, and excluding Partex, the four companies that share the existing concession are one from US and the remaining three from Europe, which points to placing priority on the appointment of the Americans. For the latter, it is up to which party places the lowest bid, but there is a high possibility that China and South Korea, without CO_2 EOR technology, could submit an outrageously low bid. How this would be adjusted between ADNOC and SPC could be the issue.

One of the ideas for solving this problem is to divide the concession mine site. The main oil fields (Bab, Bu Hasa and Asab) would go to the existing concession holders and companies with CO_2 EOR technology, and China and South Korea would be granted concessions for the other small- to medium-sized oil fields. Since South Korea already was granted a concession this March (Japan's Abu Dhabi Oil Co. Ltd. [ADOC] was also granted rights to an offshore concession in January 2011), there may be a possibility that an independent concession would be provided to the Chinese, who signed a contract with ADNOC to conduct joint research in the undeveloped concession mine sites of Abu Dhabi, separately from the ADCO concession, similar to the South Koreans.

5-5 Possibility of the Japanese Being Granted the Concession (Summary)

Expectations will grow if Inpex is prequalified by ADNOC for renewal of the ADCO concession. However, even if it manages to clear all of ADNOC's technical and financial requirements, it would be extremely difficult to clear the requirements for national security based on national defense as seen from the SPC standpoint, and there is probably no room, not only for Japan but also for China, South Korea and other Asian countries, to make inroads.

However, when the 30-year renewal of three offshore Abu Dhabi oil field concessions held by ADOC was determined in February 2011, the company also acquired rights for a new concession mine site (Hail oil field) and in March 2012, South Korea's KNOC and GS Energy were granted joint rights to two onshore oil fields (near the Dhafra oil field and Qusahwira oil field) and one offshore oil field (directly north of the Zakum oil field), indicating that for small- to medium-sized oil fields, it will be possible enough for prequalified companies to participate in future ADCO concessions that are independent of those soon to be up for renewal.

The possibility of CO_2 EOR being adopted, not only for the onshore oil fields but also for the offshore oil fields also still remains, and in light of the upcoming renewal of the concessions for ADCO, it is critical to make preparations to firmly establish CO_2 EOR technology by consolidating the forces of both Japan's private and public sectors, in order to enable Japan to renew the existing concession of ADMA-OPCO as its existing concession holder when it is up for renewal in 2018.

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