

Iran's re-emergence on global energy markets: opportunities, challenges & implications

Kalina K Damianova

KAS Energy Security Fellow at EUCERS 2014-15



EUCERS advisory board

Professor Dr Theo Farrell Chairman of the Board, Head of War Studies Department and Professor of War in the Modern World, King's College London

Marco Arcelli Executive Vice President, Upstream Gas, Enel, Rom

Professor Dr Hüseyin Bağcı Department Chair of International Relations, Middle East Technical University Inonu Bulvari, Ankara

Andrew Bartlett Managing Director, Bartlett Energy Advisers

Volker Beckers Chairman, Spenceram Limited

Professor Dr Albert Bressand Professor in International Strategic Management in Energy, University of Groningen

Professor Dr Iulian Chifu Advisor to the Romanian President for Strategic Affairs, Security and Foreign Policy and President of the Center for Conflict Prevention and Early Warning, Bucharest

Dr John Chipman Director of the International Institute for Strategic Studies (IISS), London

Professor Dr Dieter Helm University of Oxford

Professor Dr Karl Kaiser Director of the Program on Transatlantic Relations of the Weatherhead Center for International Affairs, Harvard Kennedy School, Cambridge, USA

Frederick Kempe President and CEO, Atlantic Council, Washington, D.C., USA

Ilya Kochevrin Executive Director of Gazprom Export Ltd

Janusz Luks CEO Central Europe Energy Partners (CEEP), Brussels/Warsaw

Thierry de Montbrial Founder and President of the Institute Français des Relations Internationales (IFRI), Paris

Chris Mottershead Vice-Principal (Research and Development), King's College London

Hildegard Müller Chair of the Executive Board of the German Association of Energy and Water Industry (BDEW) and member of the Executive Committee

Dr Pierre Noël Sultan Hassan al-Bolkiah Senior Fellow for Economic and Energy Security, IISS Asia

Dr Ligia Noronha Director Resources, Regulation and Global Security, TERI, New Delhi

Deepak Puri Chairman and Managing Director, Moser Baer India Ltd., Delhi

Janusz Reiter Center for International Relations, Warsaw

Professor Dr Karl Rose Senior Fellow Scenarios, World Energy Council, Vienna/London

Professor Dr Burkhard Schwenker Chairman of the Supervisory Board, Roland Berger Strategy Consultants GmbH, Hamburg

Media Partners



Published by

The European Centre for Energy and Resource Security (EUCERS) was established in the Department of War Studies at King's College London in October 2010. The research of EUCERS is focused on promoting an understanding of how our use of energy and resources affects International Relations, since energy security is not just a matter of economics, supply and technological change. In an era of globalization energy security is more than ever dependent on political conditions and strategies. Economic competition over energy resources, raw materials and water intensifies and an increasing number of questions and problems have to be solved using holistic approaches and wider national and international political frameworks.

www.eucers.eu

The Konrad-Adenauer-Stiftung (KAS) is a political foundation, closely associated with the Christian Democratic Union of Germany (CDU). KAS has more than 80 offices abroad and projects in over 120 countries. We cooperate with governmental institutions, political parties, civil society organisations and handpicked elites, building strong partnerships along the way. We focus on consolidating democracy, the unification of Europe and the strengthening of transatlantic relations, energy and security policy. The KAS Energy Security Fellowship Programme has supported young scholars in their research at European Centre for Energy and Resource Security (EUCERS) Kings College London since 2012.

www.kas.de

About the author

Kalina K. Damianova is one of the KAS Fellows 2014/15 at EUCERS and conducted her research on Iran in the context of (re-) emerging energy superpowers. She holds a MA in International Peace and Security of King's College London, focusing on the EU's energy security and the security of the Black Sea Region.

Impressum

© 2015 EUCERS. All rights reserved. Brief excerpts may be reproduced or translated provided the source is stated. Please direct all enquiries to the publishers. The opinions expressed in this publication are the responsibility of the author(s).

Editorial

Professor Dr Friedbert Pflüger Director, EUCERS
Dr Maximilian Kuhn, Chief Editor Strategy Papers, EUCERS
Arash Duero, Research Associate, EUCERS
European Centre for Energy and Resource Security (EUCERS)
Department of War Studies, King's College London

About EUCERS

Professor Dr Theo Farrell Head of Department, Department of War Studies, King's College London, Chair, EUCERS Advisory Board
Professor Dr Friedbert Pflüger Executive Director, EUCERS
Dr Frank Umbach Research Director EUCERS
Dr Adnan Vatansever Associate Director, EUCERS

Carola Gegenbauer Operations Coordinator, EUCERS

Senior Research Associates

Dr Petra Dolata University of Calgary
Androulla Kaminara European Commission
Dr Tomas Maltby King's College London

Research Associates

Jan-Justus Andreas	Dr Maximilian Kuhn
Alexandra-Maria Boese	Dr Flavio Lira
Kalina Damianova	Philipp Nießen
Arash Duero	Philipp Offenber
Moses Ekpolomo	Marina Petroleka
Lorena Guitierrez	Dr Slawomir Raszewski
Lamya Harub	Aura Sabadus
Sandu-Daniel Kopp	Ka Ho Yu
Maria Kottari	Shwan Zulal

Acknowledgements

I would like to express my sincere gratitude to Professor Dr Friedbert Pflüger, Director of EUCERS, for giving me the unique opportunity to research, develop and present the Iranian case within the inspiring context of EUCERS 2014/2015 "(Re-) Emerging Energy Superpowers". I am entirely grateful to Dr Maximilian Kuhn, Chief Editor of EUCERS Strategy Papers, for his dedication, patience, enlightening guidance and encouragement during my fellowship at EUCERS. I deeply appreciate his strong support and valuable assistance, without which this study would not have been possible.

I wish to thank the whole EUCERS' team, especially Arash Duero for having devoted time and attention to my work. My entire gratitude goes to Siamak Adibi and Neil Quilliam for their willingness to help me and for giving me the opportunity to learn from them. This study would have lacked newest data and expertise without the detailed and insightful interviews they gave me.

This project would not have been possible without the Konrad Adenauer Foundation financial support. For allowing this interaction between people highly motivated to pursue and develop academic ideas, I am entirely grateful to KAS and Mr Hans-Hartwig Blomeier, Head of the KAS office Great Britain!

Contents

Tables Figures and Maps	06
Glossary	07
Foreword	09
Executive Summary	10
Introduction	11
Iran's oil and gas sector	13
Oil sector	13
Natural gas sector	23
Conclusion	35
Pre and post revolutionary management of the Iranian energy sector	35
Pre 1979 revolution period	35
Post 1979 revolution context	39
Western perceptions of Iran	41
Conclusion	42
Evolution of Iran's petroleum fiscal regime	42
Constitutional framework	42
Laws and regulations	43
Buy-Back Contracts (BBCs)	45
Iranian (Integrated) Petroleum Contracts (IPCs)	51
Conclusion	56
Iran's re-integration into energy markets: implications	57
Iran's return to the global oil stage: impact on oil producers and consumers	57
Iran's potential place in the European Union's gas supply security	61
Conclusion	68
Bibliography	71

Tables, Figures and Maps

Table.1. Iran's Oil Production 2013–August 2015 and expectations

Table.2. Iran’s major oil fields data and present status

Table.3. Oil Refineries in Iran

Table.4. Iran's oil and other liquids production and consumption for 2004-2014

Table. 5. Iranian Gas Fields' Production capacity and expected competition years

Table.6. Natural Gas Production and Consumption (2004-2014)

Table 7. Comparison between some basic characteristics of the Iranian BBC and Iraqi TSC

Table 8. Comparison between the Main BBCs' shortcomings, IOC's Expectations, and IPCs' potential terms

Table 9. Iranian Oil Contracts

Fig.1. OPEC share of crude oil reserves, 2014

Fig.2. Iran petroleum and other liquids production and consumption

Fig.03. Monthly Iran crude oil production

Fig.04. Monthly Iranian eports of crude oil and condensate

Fig.05. Natural gas reserves of some of the key Iranian natural gas fields

Fig.6. Iran's natural gas pipeline imports and exports 2004-2013

Fig.7. Natural gas prices, 2000-2015

Fig.8. Iran's Gross Production outlook (2201-2028)

Fig.9. Iran's Gas Demand Outlook

Fig.10 Iran Gas supply and demand expectations

Fig.11. Formal and informal links (dotted lines) that influence the NIOC

Fig.12. Buy-Back Contacts

Fig.13. Iranian (Integrated) Petroleum Contracts Mechanism

Fig 14. EU Member States' different scale of gas supply dependence on Russia

Fig.15 Nabucco gas pipeline proposed route

Fig.16. South Gas Corridor route

Map.1. Key oil fields, facilities, and infrastructure

Map.2. Iran’s major natural gas fields

Map.3. Iranian IGAT infrastructure

Map.4. Zone of Tombak

Map.5. Iran LNG

Map 6. Major oil trade movements form suppliers' to consumers' regions

Map 7. LNG terminals and projects in Europe

Glossary

AIOC – Anglo-Iranian Oil Company	FTZ – Free Trade Zones
ANPP – Armenian Nuclear Power Plant	GDP – Gross Domestic Product
APOC – Anglo-Persian Oil Company	GTL – Gas to Liquids
Bbb/d – Billion barrels per day	ICSID – The International Centre for Settlement of Investment Disputes
BBC – Buy-Back Contract	IDC – Indirect Capital Cost
bbl/d – Barrels oil per day	IGAT – Iran Gas Trunkline
Bcf/d – Billion cubic feet per day	IOC – International Oil Companies
Bcm/d – Billion cubic metres per day	IOEC – Iran Oil Engineering and Construction Company
BIT – Bilateral International Treaties	IOR – Improved oil recovery
BOT – Build-operate-transfer schemes	IPC – Iranian (Integrated) Petroleum Contracts
BP – British Petroleum	IRGC – Iranian Revolutionary Guards Corps
BTE – Baku-Tbilisi-Erzurum	IRR – Internal Rate of Return
Btu – British Thermal Units	ISIS – Islamic State of Iraq and Syria
CAPEX – Capital Expenditures	ITE – Iran-Turkey Pipeline
Cf – cubic foot/feet	JCPOA – Joint Comprehensive Plan Of Action
cm/d – Cubic metres per day	JOA – Joint Operating Agreement
CNOOC – China National Offshore Oil Corporation	JV – Joint Venture
CNPC – China National Petroleum Corporation	KGR – Kurdish Regional Government
Co.M – Cost of Money	LNG – Liquefied Natural Gas
DCC – Direct Capital Cost	LPG – Liquefied Petroleum Gas
E&P – Exploration and Production	MDP n Master Development Plan
EIA – U.S. Energy Information Administration	MENA – Middle East and North Africa
EOR – Enhanced oil recovery	MMbbl/d – Million barrels per day
FEED – Front End Engineering Design	MMcf/d – Million cubic feet
FGE – Facts Global Energy	MMcm/d – Million cubic metres per day
FIPPA – Protection and Encouragement of Foreign Investment Act	MoU – Memorandum of Understanding
FLNG – Floating Liquefied Natural Gas	NCP – National Petrochemical Company

NGL – Natural Gas Liquids	PSEEZ – Pars Special Economic Energy Zone
NIGC – National Iranian Gas Company	RF – Remuneration Fee
NIGEC – National Iranian Gas Export Company	RFB – remuneration Fee Per Barrel (oil)
NIOC – National Iranian Oil Company	ROR – Rate of Return
NIORDC – National Iranian Oil Refining and Distribution Company	SEZ – Special Economic Zones
NPC – National Petrochemical Company, Iran	SGC – South Gas Corridor
OFAC – U.S. Department of the Treasury's Office of Foreign Assets Control	SP – South Pars gas field, Iran
OPEC – Organisation of Petroleum Exporting Countries	TANAP – Trans-Anatolian Pipeline
OPEX – Operating Expenditures	TAP – Trans- Adriatic Pipeline
PAs – Production Agreements	Tcf – trillion cubic feet
PEDCO – Petroleum Development Company Limited	Tcm– Trillion cubic metres
POGC – Pars Oil and Gas Company	TCP – Trans-Caspian Pipeline
PSA – Production Sharing Agreements	TPAO – Turkish Petroleum Corporation
	TSC – Technical Service Contracts
	UNICITRAL – United Nations Commission on International Trade Law

Foreword

By Dr Gerhard Wahlers, Deputy Secretary General, Konrad-Adenauer-Stiftung (KAS) and Professor Dr Friedbert Pflüger, Director, EUCERS, King's College London.

In 2014/15, for the third time in a row, the Konrad-Adenauer-Stiftung (KAS) supported the Fellowship in Energy Security at EUCERS. This year we welcomed two fellows at the European Centre for Energy and Resource Security, Department of War Studies, King's College London. Both fellows submitted innovative research proposals on the overall topic of “(Re-) Emerging Energy Superpowers”. The young researchers, Flavio Lira and Kalina Damianova, spent two semesters at King's College London to research their respective topics and assist in organising the EUCERS/ISD/KAS Energy Talks 2015 on “(Re-) Emerging Energy Superpowers”. Flavio focused on the topic of Brazil and Kalina, author of this strategy paper, on the case of Iran's Re-Emergence on Global Energy Markets: Opportunities, Challenges and Implications.

Iran is one of the most resource-rich countries in the world, with the fourth largest remaining oil reserves (9% of global reserves) and second largest gas reserves (18% of global reserves). However, its potential has been hampered by international economic sanctions imposed due to security concerns about Iran's nuclear programme. But in July 2015, after intense negotiations, the P5+1 and Iran finally reached a nuclear deal, which serves as basis for the lifting of economic sanctions. This will have a significant impact on global energy markets as well as Iran's economic environment and may place Iran on a path to reaching its full potential as an energy superpower. And not just only in fossil fuels but perhaps even in renewable energy. This is because Iran has finally recognized the vast potential of energy savings and renewable energy. The first major solar park was inaugurated in late 2014 on the capital's doorstep in Malard – using Swedish panels and German inverters.

A stronger civil society, environmental NGOs and many small firms have taken up the cause of climate protection and energy efficiency. The Iranian government has established agencies to support this development and has approved feed-in tariffs set at EUR 0.13 cents/kWh for the next five years.

In her study, Kalina explores the potential of Iran to re-emerge as an energy superpower. Her study looks at the Iranian energy sector, its current and future up and downstream projects, policies and strategies. It aims to examine the country's energy potential, to draft scenarios for its future development and to analyse the obstacles it faces. The domestic political environment and the historical, political, and economic factors influencing the management of Iran's energy resources and evolution of its petroleum fiscal regime are some of the main topics of this study. An attempt is also made to outline potential challenges for international oil and gas investors in Iran's energy sector.

We would like to thank our KAS Energy Security Fellows 2014/15 for their research contribution as well as their support for EUCERS and KAS in implementing the workshop series on “(Re-) Emerging Energy Superpowers” in 2015.

EUCERS and KAS are delighted to host this exceptional Fellowship. We would like to take the opportunity to thank Hans-Hartwig Blomeier, Director of the KAS London office and the EUCERS team for their unwavering support of our joint projects and we are looking forward to our continued cooperation.

Executive summary

The Islamic Republic of Iran's energy wealth and geo-strategic location – a bridge between East and West – allow it to export energy resources to European and Asian energy markets. However, due to various internal and international political, economic, and security constellations, Iran could not successfully exercise its energy potential internationally. Two main blocking factors – the Iranian oil contract regime which is not attractive to the International Oil Companies (IOCs) and international sanctions, imposed on Iran due to security concerns about its not fully transparent Nuclear Programme – are being presently redefined. The international agreement of July 2015, preconditioning the lifting of sanctions, and the preparation of a new more competitive oil contract framework in Iran signal a significant change in the international and domestic environment, allowing Iran to re-emerge on the global energy stage in a new atmosphere. This study examines the opportunities, challenges, and implications of Iran's re-integration into international energy markets and re-opening of its energy sector to foreign investors.

This study looks at the Iranian energy sector, its current and future up and downstream projects, policies and strategies. It aims to examine Teheran's energy potential, to draft scenarios for its future development and to analyse the obstacles in front of it. The domestic political environment and the historical, political, and economic factors influencing the management of Iran's energy resources, and evolution of its petroleum fiscal regime are some of the main topics of this study. An attempt is also made to draft potential challenges that may occur for international oil and gas investors in Iran's energy sector.

The shortcomings of the present buy-back contracts are analysed and their competitiveness in comparison with the oil contracts offered in Iraq and Iraqi Kurdistan Region is assessed. The potential new terms of the Iranian Petroleum Contracts (IPCs) are outlined and compared to the buy-back contracts. This analysis aims to evaluate

the extent to which the IPCs could suggest more satisfactory terms for the IOCs.

Finally, this study drafts some of the potential implications of Iran's re-integration into the global oil market, for the EU and other major oil producers and consumers, such as Russia, the U.S., China and Saudi Arabia. It also refracts the analysis through the prism of the EU's energy security, in order to track the opportunities that the development of the Iranian energy potential may open to the EU's gas supply security.

The findings of this study show that Iran has enormous energy potential, but its development has suffered greatly from its international isolation. After international sanctions are lifted Iran, once being a major oil producer and exporter, could re-emerge on global oil markets as a leading oil power in the short to mid term, while in terms of natural gas, it will take longer time to see Iran as a key exporter.

Iran, the world's largest natural gas reserves holder, has also a vast domestic consumption. Teheran's policy has and will continue to encourage gas allocation to the domestic market. However, the state is working to improve efficiency and increase production, which in a longer term will allow it to become a natural gas exporter.

Re-opening Iran's energy sector will offer many new opportunities for the IOCs. The speed with which Iran will regain and increase its previous oil production and export levels will depend on the investment flow, the state of the industry and its management. The development of Iran's downstream and petrochemical sectors continued under the sanctions. Teheran is expected to become gasoline and basic petrochemical products key exporter in the short term.

Therefore, it could be concluded that Iran has potential to develop in three main energy branches: oil, gas, and refinery and petrochemicals. Successfully exercising its potential, Iran could become a leading energy "superpower".

Introduction

Relations between Iran and the international community have undergone different phases — from Teheran being a key partner of the West during the Shah era to being listed as one of the main adversaries of the United States (U.S.) after the 1979 Revolution. For decades, Western involvement in security issues in the Middle East has created a sense of threat for Iran, while Iran's controversial behaviour in the region has raised the international community's concerns. In this context, a persistent atmosphere of distrust between Iran and the West has been established. This was additionally aggravated by a sequence of historical events and processes that increased suspicions between Iran and the West.

During the last decade, due to the international community's security concerns about Iran's non-transparent Nuclear Programme, the relations between Iran and the West have entered the most complicated and hostile phase to date. The international community's reaction included unilateral and multilateral sanctions imposed on Iran. The tightening of sanctions in 2012 placed Teheran in international isolation. One of the sanctions' specific focuses was to limit Iran's revenues from its energy sector. The international isolation severely affected Iran's oil and, to a lesser degree, gas industry. In general, they had devastating consequences on the Iranian economy, resulting in it contracting at a rate of 6.8 per cent 2012.¹

Sanctions' negative impact on Iran's economy and society, further aggravated by the severe drop in oil prices, brought Iran to the negotiating table. At the same time, President Hassan Rouhani's election and the new Iranian government objectives presented Teheran in a more positive light. As a consequence, after a series of negotiations, on July 14, 2015 a Joint Comprehensive Plan of Action (JCPOA) between Iran and the P5+1 (the UN Security Council 5 permanent members: the U.S., the United

Kingdom, France, Russia and China, plus Germany) negotiating parties was reached.

Reaching a permanent agreement marked a turning point in the relations between Iran and the international community. However, to maintain a stable and lasting deal, it is vital to have all parties strongly convinced to fulfil the final agreement. Yet, the perceptions at the domestic levels, in Iran and in the U.S., in particular, have remained problematic. In the U.S., there is strong lobbying against the deal and in Iran, hard-liners' statements are not supportive either.

According to Neil Quilliam, acting head of the Middle East and North Africa (MENA) Programme at Chatham House, there is not, however, a high likelihood for the agreement to be broken unilaterally from the U.S. side, if Iran remains compliant with its terms. Neither does Iran have an incentive to undermine this successful process by acting against it.²

From Iran's perspective there are strong economic interests triggering motives for political and energy cooperation. For the EU, and in particular for the UK, a defining condition that will show a substantial improvement of relations between Iran and Europe will be Iran opening up its economy and market space for European and foreign companies, which, according to Neil Quilliam, will also underline a foreign policy change from the Iranian side.³

For the Middle Eastern region the reconciliation between Iran, one of the key regional powers, and the international community has political and security implications. It is undoubtedly true that historically, predominantly Shi'a Iran and Sunni-Saudi Arabia (S.A), two key political players in the Middle East, have counter positions in the region's conflict points. The two powers, competing for regional leverage, attempt to support or fight different groups in the conflicts' hot spots, such as Yemen, Iraq and Syria. Resembling a "proxy war" approach, Iran and Saudi Arabia's behaviour in the region further

¹ Mufson, Steven, "What Ending Sanctions on Iran Will Mean for the Country's Economy," *The Washington Post*, August 12, 2015

² Quilliam, Neil. Interview by author, London, August 12, 2015.

³ Ibid.

complicates the unstable Middle Eastern security environment.

S.A., traditionally a U.S. partner, might interpret reaching a final deal with Iran as a sign of U.S. withdrawal from the region, according to N. Quilliam. Although the Nuclear Deal does not mean that the U.S. will disengage from the region, Saudi Arabia's perception as being a sole guardian of its strategic and political interests might push Riyadh into greater competition with Iran expressed in intensified local conflicts and proxy wars.⁴ In this context, in the short term, Quilliam foresees aggravation of conflicts on a regional level and in a longer term a need for U.S. diplomatic involvement mediating between the two Middle Eastern powers. At the same time, other regional actors, such as Israel that also perceives Iran as a threat to its security, might seek strategic relations with S.A.⁵ Therefore, implications from the Nuclear Deal will gradually unfold in the Middle East, redefining Iran's positions, intensifying some conflicts and preconditioning new partnerships.

Another important outcome from the JCPOA will be lifting the nuclear related EU and US sanctions on Iran. This will enable Iran to re-engage in the international energy market and financial system. The full process of lifting a complicated international legal framework of multilateral and unilateral sanctions will take 4 to 6 months and will depend on the steps taken from both sides. Therefore, progress in energy investments will not be noticed earlier than the middle or even the end of 2016.

While the UN, EU, U.S. and other states' sanctions, directly related to Iran's Nuclear Programme, are expected to be gradually lifted, the ones imposed in relation to human rights or terrorism-related issues are expected to remain present. For instance, in 1995 the U.S. banned energy investments as well as sanctioned other foreign firms investing in Iran's energy sector. Additionally, as per JCPOA, Annex, B. United States, Footnote 6, the U.S. sanctions that will be terminated 'are those directed towards non-U.S.

persons', whereas the U.S. persons 'will continue to be generally prohibited from conducting transactions of the type permitted pursuant to this JCPOA, unless authorised to do so by the U.S. Department of the Treasury's Office of Foreign Assets Control (OFAC)'.⁶ For the European companies, however, lifting sanctions will open opportunities for investments in Iran. This will inevitably lead to another pending question under what legal regime will foreign investments take place?

Iran has a history of being very protective and reluctant to let foreign involvement in its energy sector. The Iranian Constitution prohibits foreign and private ownership of natural resources and the state-owned National Iranian Oil Co. (NIOC) is responsible for the Iranian energy upstream sector. Through the present oil contract system—the buy-back contracts (BBCs)—the IOCs are able to participate only in exploration and development phases of oil fields. The inflexible and risk-hiding conditions of the BBCs made the foreign companies unwilling to invest in Iran, even before the sanctions.

In the context of a global oil oversupply, the NIOC, motivated to attract IOCs back to its energy sector, announced the preparation of new oil contracts, Iranian or also called Integrated Petroleum Contracts (IPC). The IPCs official introduction, originally planned to take place in London was postponed several times and it is now expected to be announced in December 2015.

It can be argued that the post-revolutionary Iranian oil legal regime reflects two conflicting tendencies: Iran's rational motivation to improve its energy sector by attracting foreign investments and Iran's historically inherited reluctance to grant foreign companies access to it. With the latter usually having a strong influence, the extent to which the new legal terms will be satisfactory to the international private sector is going to be important. So far, there are encouraging signs that IPCs will offer significantly improved conditions.

⁴ Ibid.

⁵ Ibid.

⁶ "Joint Comprehensive Plan of Action" (JCPOA), 14 July 2015, Annex, B. United States, Footnote 6, from European External Action Services (EEAS) Documents on Europa website

Their competitiveness will be a determinative precondition for IOCs return to Iran.

The positive signs of reconciliation on the international stage, the more moderate political atmosphere in Iran and Teheran's willingness to draw back foreign investors to its energy sector mark a significant change of the domestic and international environment. In this new context, the next Chapter looks into the Iranian energy sector's potential and strategies. It aims to identify some of the main obstacles that Iran might face in realising its energy goals and to draft potential expectations about the development of Iran's oil and gas industry.

Iran's oil and gas sector

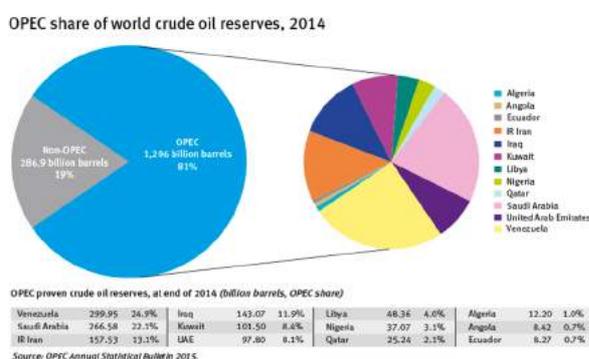
Oil sector

Production

Facts:

Around 10% of the world's crude oil reserves and 13% of OPEC are in Iran (see. Fig.1.).⁷

Fig.1. OPEC share of crude oil reserves, 2014



Source: Annual Statistical Bulletin 2015, OPEC

Iran's oil production levels have varied during the years. In the mid and late 1970s, Iran's oil production averaged over 5.5 (MMbbl/d).⁸ After the 1979 Revolution, poor management in the Iranian oil and gas industry and lack of enough investment in the oil sector, coupled with rapid natural declines in Iran's mature oil fields and decreased the production levels significantly.

According to Arash Duero, Research Associate at EUCERS, a key reason for the fast decline of some oil fields is related to the optimum rate of production. If this rate is exceeded, the overall productivity of the field is reduced. Due to economic reasons, the Shah sought greater production rates, ultimately resulting in a faster decline as the pressure used to pump the oil out pressed the rest of the oil deeper into rock formations, making their extraction more difficult if not impossible.⁹ The natural decline rate of 8% to 11%, is additionally aggravated by a low recovery rate of 20 to 25%, which results in a continued depletion of the Iranian production capacity.¹⁰

International sanctions have significantly affected the Iranian oil production levels (see Fig.2.). According to the U.S. Energy Information Administration (EIA) data, in 2013 Iran produced 3.2 MMbbl/d of petroleum and other liquids—roughly 2.7 MMbbl/d crude oil, 0.4 MMbbl/d condensate, and 0.1 MMbbl/d, natural gas liquids (NGL), 1.0 MMbbl/d—almost 25% lower than the production level of 4.2 MMbbl/d in 2011.

Nevertheless, for the first half of 2014 the total oil production increased by an average of almost 200,000 bbl/d, compared to the annual average in 2013. Subsequently, there was a corresponding increase in Iran's exports for 2014 (see Fig.2.).¹¹ The latest available data shows that in July 2015, Iran's output was 2.85 MMbbl/d.¹² Figure 2 shows

⁸ Ibid.

⁹ Duero, Arash, interview by author, King's College London, July 20, 2015

¹⁰ "Iran", EIA

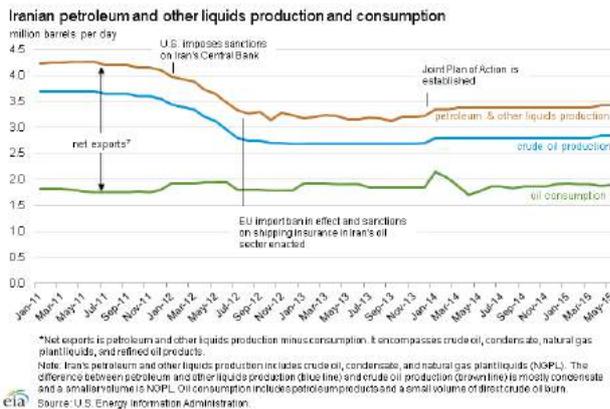
¹¹ Ibid.

¹² Kalantari, Hashem, "Iran Targets 45 Oil and Gas Projects in Plan to Boost Output," *Bloomberg Business sec*, August 13, 2015

⁷ "Iran International Energy Data and Analysis." U.S. Energy Information Administration - EIA - Independent Statistics and Analysis. <http://www.eia.gov/beta/international/analysis.cfm?iso=IRN>, Accessed April, 2015.

the Impact of international political developments on production and consumption of petroleum and other liquids in Iran, for the period 2011-2015. In 2014 Iran ranked third of the Organisation of Petroleum Exporting Countries (OPEC), in terms of crude oil production (see Fig.1.).

Fig.2. Iran petroleum and other liquids production and consumption



Source: U.S. Energy Information Administration (EIA)

Expectations:

According to Bijan Zanganeh, Iran's Oil Minister, after sanctions are lifted, Iran's priority will be to reach its pre-sanctions production—up to 4.0 MMBbl/d—in the first 7 to 8 months and to increase that to about 5.7 MMBbl/d within additional 3 years.¹³ Zanganeh suggests a rise of 500,000 bbl/d within a week after the sanctions and 1.0 MMBbl/d in a month later.¹⁴ Although opinions vary, most experts consider this forecast too optimistic.

A more realistic expectation would involve a gradual and more moderate increase in production. Sceptical views suggest a gradual rise of Iran's production with about 600,000 bbl/d up to 2017 and a total crude production capacity increase up to about 3.4 MMBbl/d in 2020.¹⁵

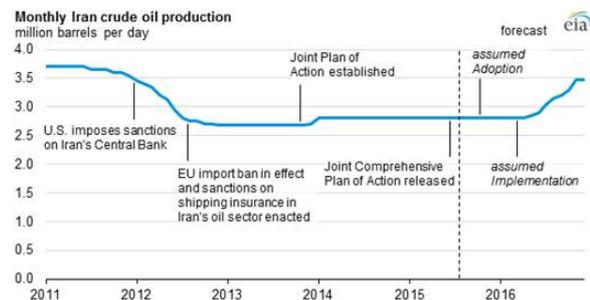
¹³ "Video Keynote and Live-Interview: Bijan Namdar Zanganeh (English)", Frankfurter Allgemeine Forum, Energy Summit Berlin 2015, found on *YouTube*

¹⁴ Kalantari, Hashem and Motevalli, Golnar, "Iran Oil Minister Says Output to Rise a Week After Sanctions" *Bloomberg*, August 2, 2015

¹⁵ "Industry Views - Could Iran Nuclear Deal Revive Its Oil and Gas Industry?" Wood Mackenzie, July 1, 2015.

Optimistic perspectives do not go much beyond additional 800,000 bbl/d¹⁶ soon after sanctions are lifted and expect a total production rate of 4.0 MMBbl/d¹⁷ by end of 2017. According to the latest EIA estimations (August 2015) Iran has 'the technical capability' for a rise of its total oil production by about 600,000 bbl/d by the end of 2016 (see Fig.3).¹⁸

Fig.3. Monthly Iran crude oil production



Source: Villar, Lejla. "Nuclear accord creates potential for additional crude oil production from Iran" EIA

However, the speed and rate of production increase will depend on a combination of factors such as sanctions relief implementation, investment flow and overall condition of the oil sector. In this regard, predictions that Iran could reach pre-sanctions production levels very fast are realistic if, for example, during the period of isolation the oil sector has been kept in a good condition. In such case and in an event of significant investment flow in the sector Iran will be able to surpass even 4.0 MMBbl/d in a shorter period than expected. Realistically, 500,000 bbl/d increase of Iranian oil production in the first quarter of 2016 is possible. Furthermore, Iran crude oil production can reach 3.6-3.7 MMBbl/d in late 2016 or early 2017.

¹⁶ Silicon Valley Bank (SVB) figures quoted in "Post Sanctions Iran: a 5 MMBOPD reality check" Facts Global Energy, July 30, 2015

¹⁷ Moody's rating agency quoted in Kerr, Simeon. "Increased Iran oil output puts other exporters under pressure" *Financial Times*, July 20, 2015

¹⁸ "Nuclear accord creates potential for additional crude oil production from Iran" EIA, August 15, 2015

Table.1. Iran's oil production 2013–August 2015 and expectations

Thousands barrels per day	Based on direct OPEC communication	Based on secondary to OPEC sources
2013	3,576	2,673
2014	3,117	2,766
4Q14	3,005	2,763
1Q15	3,017	2,779
2Q15	3,103	2,831
Jun. 15	3,110	2,823
Jul. 15	3,130	2,853
Aug. 15	3,180	2,857
Expectations for 1Q2016	Increase by 500	
Expectations for late 2016/2017	Reach up to 3,600-3,700	

Source: Author's table: OPEC figures used for Iran's Oil Production for 2013-August 2015 (OPEC Monthly Oil Market Report Sep. 2015). Expectations are based on own analysis.

Oil fields and upstream projects

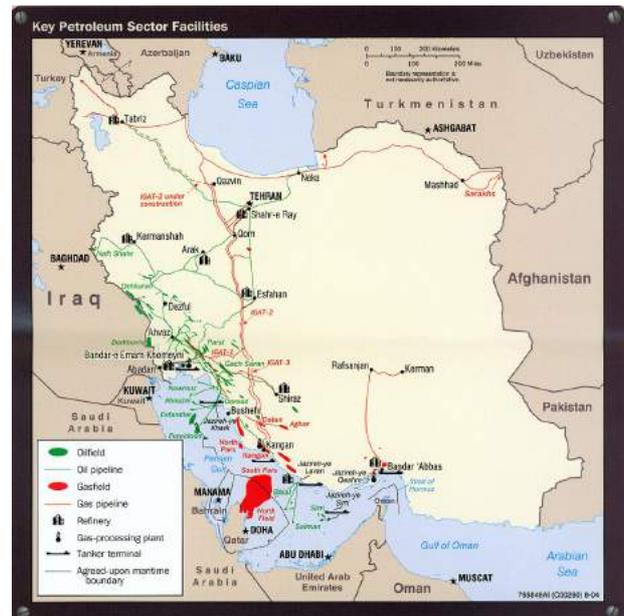
Facts:

According to EIA, 70% of Iran's crude oil reserves are onshore, while the remaining 30% are located off-shore, mainly in the Persian Gulf (see Map1.). The majority of the onshore fields are in the Luristan-Khuzestan basin, located in the southwest near the Iraqi border.¹⁹ Iran shares offshore fields with its Gulf neighbours.

There is not clear information about the oil reserves located in the Caspian Sea. EIA suggests that Iran has proved and probable oil reserves of

approximately 500 million barrels,²⁰ whereas other sources suggest that the capacity of the Caspian site could reach 12 billion barrels of oil (Bbbl).²¹ Another potential estimation is that the Caspian reserves amount to 3 Bbbl/d. Due to territorial disputes between Iran and the other littoral states, there are not many activities in this area.

Map.1. Key oil fields, facilities, and infrastructure



Source: National Iranian Oil Co. NIOC website

According to EIA, 80% of Iran's crude oil production capacity is from two crude streams—Iran Heavy and Iran Light. Iran's largest producing oil fields are the onshore Ahwaz-Asmari, Marun, and Gachsaran fields. They are located in Khuzestan Province. The state's largest offshore field is the Abuzar field. It has a production capacity of 175,000 bbl/d. Due to international sanctions imposed on the Iranian upstream industry, there have not been any new fields to start production for more than 7 years. In spite of the slowed process, a few projects are still being developed. Two of the key projects are the North/South Azadegan, which contains 6 to 7 billion barrels of recoverable crude oil reserves and Yadavaran with 3.2 billion barrels.²² Data and

²⁰ Ibid.

²¹ Nasser, Ladane and Daya, Ayesha. "Caspian Sea Oil for More Than a Century," *Bloomberg*, May 20, 2012

²² Ibid.

¹⁹ "Iran", EIA.

status of some of the main oil fields are provided in the table below (see Table.2.).

Table.2. Iran's major oil fields data and present status

Project	Recoverable Reserves Billion Barrels	Developer	Present status
South Azadegan	6.0 to 7.0 (for the South and North)	2004 Consortium–NIOC (25%) & Japan INPEX (75%) → cancelled. 2011 China National Petroleum Corporation (CNPC) contract–2014 NIOC cancelled. National Iranian Drilling Company (NIDC) is drilling at the moment.	Called Majnoon in Iraq. 2007–online 2013–50,000 bbl/d. produced Phase I targets– 150,000 bbl/d Phase II– 110,000 bbl/d. NIDC has completed the drilling of six wells and targets six more.
North Azadegan	-----	CNPC is developing it in 2 phases	2015–2016 Phase I (75,000 bbl/d). 2020 Phase II 75,000 bbl/d. Total = 150, 000 bbl/d.
Yadavaran	3.2	China Petroleum & Chemical Corporation (Sinopec) signed a buyback contract at the end of 2007 to invest \$2.2 billion.	2015–55,000 bbl/d. output; 2016–expected output 85,000 bbl/d. Phase II–add 50,000–100,000 bbl/d in 2018. Phase III–100,000 bbl/d after 2020. 450 km of pipelines in place; 165km of export pipelines; construction of production plant– 80 %.
Yaran	about 2	South Yaran–PEDEC (Petroleum Engineering and Development Company) North Yaran– local company—Persian Energy	North Yaran: 2015–expected oil production of 30,000 bbl/d . South Yaran: 2015–expected oil production over 40,000 bbl/d; 2018–50,000/60,000 bbl/d.
Azar	2.5	Iranian contractor companies with a buyback deal worth over \$1bn	Called Badra (Iraqi side). Sept.2015– 30,000/35,000 increase; Expected–total increase of 65,000 bbl/d. Project is delayed. 5 drills in place Natural gas—transferred to the petrochemical plants in Dehloran.

South Pars (oil layer)	1.3	PEDCO (Petro Iran Development Company) contracted by NIOC to conduct feasibility studies on the field's storage depots, prepare the field's comprehensive development plan, carry out drilling operations and produce, install and launch the project's processing equipment.	April 2015-completed 35,000 bbl/d.capacity. 7 wells drilled in the South Pars oil layer (operating in the SP Phase 20). Production expected-late 2016 or early 2017.
	Zagheh	3	Iran is looking for a new developer. potential production-55,000 bbl/d of heavy crude.
Bushgan, Kuh-e-Kaki, Kuh-e-Mond	1.1	2014 cancellation of the MoU signed with Russian and Ukrainian companies. Iran is looking for a new developer.	The total production potential is estimated at 22,000 bbl/d.
Darkhovin	---	2001-BBC with Eni, 2014-Eni sold its share to local companies after the sanctions .	Aug.2015-talks for Eni's return to Darkhovin.

Source: Author's own table, for further information, see the referenced sources.²³

²³ "Iran Accelerates Drilling of Largest Oilfield." Press TV, June 25, 2015.

"Iran". EIA

Atanasova, Slavka. "Iran Set to Pump Oil from Azar Field in 2015." *Arabian Oil and Gas*, October 12, 2014.

"PEDCO to Drill Three Wells in SP Oil Field." *Iran Daily*, April 19, 2015

"Yadavaran Project Progresses by 94%." *Iran Daily*, December 28, 2014.

"Yaran Output Set to Rise." Shana Petro Energy Information Network. January 12, 2015.

Expectations:

45 oil and gas projects are expected to be offered by Iran to foreign companies in December 2015 at a conference in London. According to the Iranian President Hassan Rouhani, the country mainly focuses on developing oil and gas fields it shares with neighbouring countries.²⁴ According to Jalil Jaafari, secretary of the Majlis Energy Committee, oil production from Yadavaran, North Azadegan, South Azadegan, North Yaran and South Yaran oil fields will be a priority for Iran.²⁵ These fields Iran shares with Iraq.

Other shared fields that are expected to be of interest for investment are: Reshadat, Forouzan, the first phase of the development plan of the oil layer of South Pars gas field, Arvand oil field, the second phase of Dehloran, Paydar Gharb-Asmari, the second phase of Aban, Sohrab, Changouleh and the first phase of Esfandiar and Arash oil field. Among the non-shared fields are the second phase of Mansouri oil field, Band Karkheh, Jorair, Somar, the second phase of Danan, the third phase of Darkhovain, Sosangerd, Sepehr, Cheshmeh khosh-Bangestan, Resalat, Abozar, Doroud, Norouz and Zagheh oil field.²⁶

Significant development in terms of foreign investments in the Iranian oil sector is expected to begin in the end of 2016 or even in the middle of 2017. While the U.S. companies are still under sanctions, Spain's Repsol, Royal Dutch Shell, British Petroleum (BP), France's Total, Italy's Eni and Russia's Lukoil have shown interest in investing in Iran

Downstream and petrochemical industry

Oil refinery

Facts:

National Iranian Oil Refining and Distribution Company (NIORDC), a subsidiary of the Ministry

of Petroleum, is responsible for almost all the refining activities in Iran. NIORDC has a share of 20% in each of the refineries, except Abadan and Imam Khomeini refining companies, where its share is 100%.²⁷

Table.3. Oil Refineries in Iran

Refinery	Crude distillation capacity (thousand bbl/d)
Abadan	400
Isfahan	375
Bandar Abbas	330
Tehran	250
Arak	250
Borzuyeh	120
Tabriz	110
Shiraz	60
Lavan Island	60
BooAli Sina	34
Kermanshah	22
Aras 2	10
Booshehr	10
Aras 1	5
Yazd	3
Total	2,039

Source: Facts Global Energy, December 2014.

Source: FGE in EIA, "Iran"

An average of 63 million litres of gasoline per day (MML/d) is processed in local refineries and another 5 million litres are imported to cover shortfalls.²⁸ According to Fars News Agency, Iranian strategy targets an increase of gasoline and gas oil production capacity by 64 and 12 million litres per day through the finalisation of nine ongoing development plants at oil refineries.

The projects consists of gasoline making units at Abadan, Tabriz, Isfahan, Bandar Abbas, Tehran (Shahid Tondgouyan), Imam Khomeini (Shazand) plus development and upgrading plants at Persian Gulf Star and Lavan oil refineries. It is expected that after their realisation production of kerosene

²⁴ "Oil Industry Becoming Efficient in 6th Development Plan." *Shana*. April 20, 2015.

²⁵ "Iran Set to Double Oil Exports" *Shana*, April 6, 2015

²⁶ "NIOC Introducing New Projects at Tehran Oil Exhibition." *Shana*, April 29, 2015.

²⁷ National Iranian Oil Refining & Distribution Company." NIORDC" Website. <http://www.niordc.ir/index.aspx?siteid=77&pageid=536>, Accessed June 13, 2015.

²⁸ "Iran Nears Gasoline Refining Milestone." *Press TV*, August 3, 2015.

and jet fuel will rise each by 7.4 Ml/d and liquid petroleum gas by 7.4 MMI/d.²⁹ The state is building another oil refinery in Kermanshah, in western Iran. In September 2013, Iran's total crude oil distillation capacity was nearly 2.0 MMbbl/d, about 140,000 bbl/d more than the previous year. This increase is due to the expansion projects that were completed at the Arak and Lavan refineries.³⁰

Expectations:

According to Siamak Adibi, Senior Consultant in Facts Global Energy (FGE) and ex-Senior Expert in the Natural Gas Marketing and Sales Department of National Iranian Gas Export Company, Iran's policy is focused on the completion of Bandar Abbas condensate splitters (Persian Gulf Star Refinery), which will make Iran able to meet its gasoline requirements. This project is considered to be the most important refining project in Iran presently. When Bandar Abbas condensate splitters are on-stream, Iran will become self-sufficient in gasoline and will start gasoline exports from 2017.³¹

Persian Gulf Star Refinery is expected to produce 13.5 MMI/d of Euro IV gasoil and 36 MMI/d of Euro IV gasoline. 36 MMI/d are expected to be added to Iran's gasoline and diesel production with its completion. Only the entry of one train of the refinery into generation can add 12 MMI/d of gasoline, half of which covers Iran's imports. The plant is further expected to produce 360,000 bbl/d of gas condensates on top of jet fuel and other products. The refinery is being built in Assalouyeh at an estimated cost of €2.5 billion, but it is presently experiencing financing difficulties.³²

Siamak Adibi ranks Siraf oil refinery as Minister Zanganeh's second highest priority project after the Persian Gulf Star Refinery. Siraf is the first public-private partnership in Iran of this magnitude. It is a combination of private and

public interest. In the Siraf Condensate Park, there are eight condensate splitters of 60 000 bbl/d each. Of the total, 20% is maintained by the SIRAF authority, which is a fully-owned subsidiary of NIOC and 10% each by eight partners.³³

The partners include Bank Pasargad Petroleum Development Group, headed by the veteran former NIOC CEO Mirmoezzi, as well as a consortium headed by Sazeh, a well-established engineering consulting group, which has partners, such as Falcon of the United Arab Emirates and the Nargan Group. These two groups are discussing a strategic alliance to work together, creating a world-class 120,000 bbl/d splitter, possibly upgrading the diesel to Euro V specs, and perhaps adding downstream units to take naphtha into the petrochemical unit, according to Adibi. The rest of the investors include pension funds of several major government organizations.³⁴

The concept of Siraf is to buy condensate at international market prices at 95% of FOB (Free on Board) from the Persian Gulf and to sell naphtha at the global market price. It is up to each individual investor's wish to upgrade and go further downstream, according to Adibi. He points out that the location of Siraf is "absolutely unique"—it is in the middle of all condensate refineries and condensate flows. They use existing storage tanks, existing utilities, and all available infrastructures. Distance from supply is often just 1 or 2 kilometres. The location probably saved the project some US\$1-1.5 billion, in his opinion. Adibi points out, that there was an original estimate of IRR (Internal Rate of Return) of 44% when the project was mentioned for the first time. It was based on US\$100/bbl of oil and assumed feed cost and output price to maintain the same relation as in 2014. The project, according to him, might give a 10-12% IRR on a realistic basis, much of it due to the location and good planning.³⁵

The fuel oil and gasoil exports will be affected by the development of several South Pars Phases. Over the next few years, Iran is expected to

²⁹ "Oil Minister: Persian Gulf Refinery to Make Iran Gasoline Exporter in Early 2015." *Fars News Agency*, February 6, 2015.

³⁰ Facts Global Eenergy (FGE) quoted in "Iran." EIA

³¹ Adibi, Siamak. Interview by author. London, August 17, 2015

³² "Oil Minister: Iran to Export Gasoline." *Press Tv*. February 5, 2015.

³³ Adibi, interview.

³⁴ *Ibid.*

³⁵ *Ibid.*

complete South Pars phases 15-18, as well as 19-21. These phases produce significant gas for the power sector and Iran will substitute fuel oil and gas oil with natural gas for power generation. This will increase the surplus for both and Iran will become a large product exporter in the near future. The majority of these products will go to Asia, the remaining to Europe.³⁶

Petrochemical industry

Facts:

The National Petrochemical Company (NPC) is responsible for the development and operation of the country's petrochemical sector. It is the second largest producer and exporter of petrochemicals in the Middle East. After oil, the petrochemical industry in Iran is the second largest source of foreign earnings. Iran's total production of petrochemicals does not exceed 45 million tonnes, while the state has the capacity to produce 60 million metric tonnes.³⁷

The petrochemical industry in Iran is, in fact, mainly gas-based. The Iranian government is said to have been supporting gas-based industries such as petrochemicals, cement, aluminium, and steel, as well as integrated gas projects.³⁸ Approximately \$70 billion of investments are needed to be absorbed within the next 10 years by the petrochemical industry.³⁹ Iran has more than 70 projects that are waiting to be finished. In the short term, by completing some of its unfinished petrochemical units, Iran's production capacity is expected to rise 120 million metric tonnes.⁴⁰

Expectations:

Iran is focused mainly on downstream products. There are currently few projects for production of basic products. Several projects are for production of polyethylene and most of them are currently at an early stage of construction. Iran's priority is completion of these projects rather than introduction of new ones, according to Adibi. The

Iranian government prefers the private sector to get involved in new petrochemical initiatives.⁴¹

In this regard, NPC strategy targets a production capacity of over 100 million tonnes through implementing developmental projects with an investment of \$40 billion with participation of private/nongovernmental investors.⁴² Necessary measures such as: setting of required infrastructure, stable regulations and final competitive formula for setting the price of feedstock to petrochemical plants, are being envisaged in order to prepare the petrochemical sector for foreign firms.⁴³ There are more chances for IOCs to get involved in the production of basic products such as ethylene, propylene, and/or methanol.⁴⁴

In terms of exports, Iran is interested in China, India, East Asia and Europe as buyers.⁴⁵ The prices of the polymer products have declined by 10-20% in line with the drop in oil prices.⁴⁶ Iran's petrochemical exports have not been under direct sanctions, thus lifting of sanctions should not directly affect the polymer products prices.

Domestic consumption and policies

Domestic consumption

Natural gas and oil are accounting for 98% of the energy consumption in Iran.⁴⁷ Iran has a growing energy consumption and it is the second-largest oil consuming country in the Middle East. The total oil consumption averaged about 1.75 MMbbl/d in 2013, almost 3% higher than the year before.⁴⁸ Iran developed its domestic oil refining capacity, because under the international sanctions regime, it could not import the same amount of gasoline and other products to meet its domestic needs.

Iran is currently importing 50,000 bbl/d of gasoline and exporting other products such as fuel

³⁶ Adibi, interview.

³⁷ "Iran dismisses Saudi petrochemical fears," *PressTV*. 19 August, 2015

³⁸ Khajepour, Bijan. "The Future of the Petroleum Sector in Iran." *Future of Iran Series*, Legatum Institute (2013)

³⁹ "Iran dismisses" *Press TV*

⁴⁰ *Ibid.*

⁴¹ Adibi, interview

⁴² National Petrochemical Company (NPC) website <http://english.nipc.ir>, Accessed: August 2015

⁴³ "Official Calls for Facilitating Foreign Investments." Shana, August 12, 2015.

⁴⁴ Adibi, interview.

⁴⁵ *Ibid.*

⁴⁶ "Iran dismisses" *PressTV*

⁴⁷ "Iran". EIA

⁴⁸ *Ibid.*

oil, liquefied petroleum gas (LPG), and gasoil.⁴⁹ According to EIA, in 2013, almost all of Iran's product consumption was locally produced. Facts Global Energy (FGE) estimates that Iran imported almost 17,000 bbl/d of petroleum products of which roughly 85% was gasoline.⁵⁰

Despite the refinery expansions, at the Isfahan and Bandar Abbas refineries, FGE expects Iran's gasoline imports to increase over the medium and long term because of high gasoline demand and the government's plan to reduce gasoline production at petrochemical plants. The gasoline demand, however, is expected to first decrease in the short term, because of higher prices as a result of subsidy cuts, and then to rise again.⁵¹

Trend News agency reports that Iran's gasoline consumption amounted to 71.4 MMI/d in the spring of 2015, compared to 69.4 MMI/d in the spring of 2014. For the past Iranian fiscal year (ended on March 20, 2015), gasoline consumption rose by 1.8 per cent compared to the previous Iranian year, while production fell by 4 per cent year-on-year.⁵²

Table.4. Iran's oil and other liquids production and consumption for 2004-2014

Thousand barrels daily	Oil production *	Oil Consumption **
2004	4,201	1,549
2005	4,184	1,700
2006	4,260	1,845
2007	4,303	1,875
2008	4,396	1,960
2009	4,249	2,012
2010	4,352	1,874

⁴⁹ Adibi, interview.

⁵⁰ Facts Global Energy (FGE) cited in "Iran," EIA

⁵¹ Ibid.

⁵² Karimov, Fatih. "Iran's Gasoline Consumption Hits 6.6B Liters in Spring." *Trend News Agency*, July 2, 2015.

2011	4,373	1,910
2012	3,742	1,928
2013	3,525	2,038
2014	3,614	2,024
Change 2014 over 2013	2.0%	-2.0%

*Includes crude oil, shale oil, oil sands and NGLs (natural gas liquids – the liquid content of natural gas where this is recovered separately). Excludes liquid fuels from other sources such as biomass and derivatives of coal and natural gas**Inland demand plus international aviation and marine bunkers and refinery fuel and loss. Consumption of biogasoline (such as ethanol), biodiesel and derivatives of coal and natural gas are also included.

Source: Author's table based on BP Data (BP Statistical Review of World Energy, June 2015)

Domestic Policies

Oil utilisation for domestic market needs decreases the amount of available volumes for exports. Therefore, Iran, being a traditional oil exporter and with oil exports revenues significantly contributing to its Gross Domestic Product (GDP), has been taking concrete steps to decrease oil utilisation for domestic needs. Part of the concept—"freeing oil for exports"—has been the continuous change in the energy mix in state. Iran has been working in this direction since 2007, by allocating more gas for domestic needs instead of oil. In February 2015, the Iranian Minister of Oil stated that Iran is planning further developments in this direction by utilising more gas and alternative fuels for commercial and private vehicles and the industry.⁵³

The high levels of energy consumption and lack of efficiency were also addressed in the last decade. The Iranian energy prices, in particular the gasoline prices, are largely affected by subsidies, a policy that is not unique to Iran, but also spread in other Middle Eastern countries. Due to the negative economic effects of the subsidies, namely in keeping the prices low and stimulating consumption growth, Iran launched a subsidy

⁵³ "Keynote and interview Zanganeh" Frankfurter Allgemeine Forum. Youtube

reform. The effectiveness of the subsidy changes in Iran is arguable.⁵⁴ However, according to FGE, the reform led to a rise in the gasoline prices, thus a subsequent decline in demand is expected.⁵⁵ This tendency, though, is not expected to last, since the demand is, nevertheless, expected to grow in the future.

Export terminals and exports

Facts:

The major Iranian oil fields are situated in the South of the country. Therefore, the main oil terminals, responsible for the crude oil exports are in the Persian Gulf, at Kharg, Lavan, and Sirri Islands. Terminals at Cyrus and Bahregansar are responsible for a smaller amount of crude oil exports.⁵⁶ Iran has also a small oil terminal in the Caspian Sea at Neka used for oil swap with Turkmenistan and Kazakhstan. Iran swapped oil with Turkmenistan and Kazakhstan from 1997 to 2009. It was receiving oil from both countries at the Neka terminal and exporting equivalent volumes from Kharg terminal. The rest of the terminals deal with refined product exports and imports.

According to OPEC, in 2010 the amount of oil supplied by Iran to Europe was around 890,000 bbl/d.⁵⁷ Iran's key European oil consumers before the oil embargo were Italy, Spain, France, and Greece. Due to the imposed ban on Iranian oil imports, all Iranian supplies to the EU came to a complete halt.

In general, the US and the EU sanctions led to a significant drop in Iran's exports of crude oil and condensate, from 2.5 MMbbl/d in 2011 to 1.1 MMbbl/d in 2013.⁵⁸ FGE states that 'Iran exported about 240,000 bbl/d of petroleum products in 2013, a declining of about 40% compared to 2011, most of which was fuel oil and LPG sent to Asian

markets'.⁵⁹ Currently the largest consumers of Iranian crude oil and condensate are China, India, Japan, South Korea and Turkey (see Fig.4).

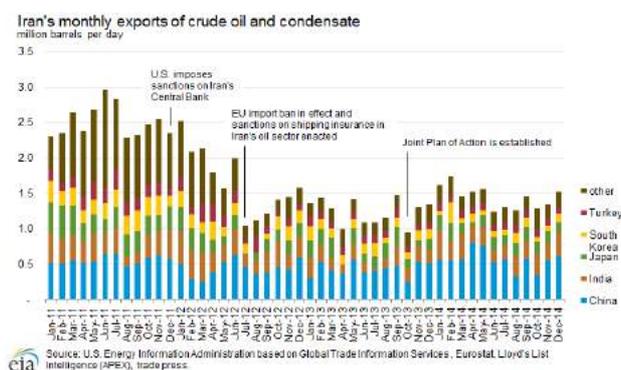
Expectations:

The implementation of sanctions lifting is expected to start by mid-2016 and only after then, a more significant effect could be seen on Iran's oil production and exports. Iran has about 30 MMbbl (half condensate and the rest is mainly medium, sour crude oil) held in storage. In this regard, Iran can increase its total global supply by about 100,000 bbl/d by the end of 2015.⁶⁰

According to Zanganeh, Iran's oil exports can reach 500,000 bbl/d immediately after any lifting of sanctions. Goldman Sachs estimates that Iran can supply an extra 200,000-400,000 bb/d in 2016,⁶¹ while other experts refer to greater amounts of between 300,000-500,000 bbl/d.

The Sixth "Five-year Development Plan" addresses problems, such as projects behind schedule for launching, mainly due to allocating oil industry financial resources to paying subsidies. The plan acknowledges that there is a high level of energy intensity, with a low level of oil and gas trade in the region.

Fig.4. Monthly Iranian eports of crude oil and condensate



Source: EIA, "Iran"

Additionally, it acknowledges that there is high level of the share of heavy oil products like fuel

⁵⁴ Stevens, Paul. "Prospects for Iran's Oil and Gas Sector" Middle East and North Africa Programme & Environment, Energy and Resources Department, *Chatham House* (2015), 5.

⁵⁵ Ibid.

⁵⁶ "Iran," EIA

⁵⁷ Stevens, Paul. "An embargo on Iranian Crude Oil Exports: How Likely and with What Impact? ", Middle East and North Africa Programme & Environment, Energy and Resources Department, *Chatham House*, (2012), 2

⁵⁸ Ibid.

⁵⁹ Ibid.

⁶⁰ Villar, "...additional crude oil production from Iran," EIA

⁶¹ "Iran Oil & Gas Summit 14-16 December 2015 London, UK." Iran Oil Gas Summit. CWC Group Ltd. 2015. <http://www.iranoilgas-summit.com> Accessed: July, 2014

oil in oil products of refineries. Technical and management problems, which contractors and domestic manufacturers face, are also dealt with in the plan.⁶² Changing the country into a key player on the global energy market is the final and main target of the plan, which ends in 2020.⁶³ According to Zanganeh, Iran's plans for oil exports include restoring its previous market share and increase of its exports on global energy markets, as Asian markets will likely be Iran's priority.⁶⁴

According to Dr Frank Umbach, Research Director at EUCERS, King's College London, due to the worldwide oil competition, energy efficiency, which is absent in Iran, is becoming an important factor. Furthermore, the oil price decline will negatively affect Iran's oil sector and hamper the increase of its exports.⁶⁵

Concerning the oil price drop, David Jalilvand, a PhD candidate at the Berlin Centre for Caspian Region Studies, suggests that since the share of oil and gas revenues in the Iranian budget is about 30% and will be decreased to about 20% in the next budget starting from March the 21st 2015. Difficulties stemming from the prices are considerable, but according to him, they should not be overestimated at the same time. Moreover, the new budget will be based on an oil price of \$72 and some non-tax paying semi-governmental companies will have to pay their share of taxes. According to Jalilvand, Iran has also increased its petrochemical exports, thus improving the balance of its non-oil trade.⁶⁶

Natural gas sector

Production

Facts:

Iran has the world's largest proven natural gas reserves (34 trillion cubic metres),⁶⁷ 17% of the world's reserves and more than one-third of OPEC's reserves. Iran is the world's third largest natural gas producer, accounting for nearly 5% of the world's dry natural gas production in 2012 and its share is expected to increase.⁶⁸ For 2013 gross gas production was 622.404 Mcm/d (21.98 bcf/d), gas re-injection—82.892 Mcm/d (2.892 bcf/d), gas flaring—45.193 Mcm/d (1.596 bcf/d), gas shrinkage and loss—58.870 Mcm/d (2.079 bcf/d) and marketed gas production—436.362 Mcm/d (15.41 bcf/d).⁶⁹ Although the sanctions have affected the natural gas industry, the consequences are not as severe as the ones for the oil sector.

Expectations:

According to Professor Jonathan Stern, Chairman and Senior Research Fellow at the Natural Gas Programme, Oxford Institute for Energy Studies, in spite of Iran's difficult situation, it has managed to create a massive increase in its gas production.⁷⁰ Additionally, Iran is expected to rapidly increase its natural gas production in the near future. According to FGE, Iran's gross natural gas production will increase to 331.307 Bcm/d (11.7 Tcf) in 2020.⁷¹

The speed and rate of the growth will depend on the progress that is made in developing the South Pars gas field. Similarly to the oil sector development, the natural gas industry in Iran has a vital need of foreign investments. New investments and efficient domestic consumption could make Iran a leading gas exporter after 2025. Scenarios drafting the future consumption/production balance are provided in the last section of this Chapter.

⁶² "Oil Industry Becoming Efficient in 6th Development Plan", *Shana*, 20 April, 2015

⁶³ *Ibid.*

⁶⁴ "Key note and interview, Zanganeh", Frankfurter Allgemeine Forum, YouTube

⁶⁵ "1st EUCERS/ISD/KAS Energy Talk 2015", Department of War Studies, King's College London (KCL), Report by Kalina. K. Damainova,

⁶⁶ *Ibid.*

⁶⁷ "Natural gas Reserves", British Petroleum (BP) website

⁶⁸ "Iran", EIA

⁶⁹ Data acquired from FGE

⁷⁰ "1st EUCERS/ISD/KAS Energy Talk 2015", KCL

⁷¹ FGE

Natural gas fields and upstream projects

Facts:

Vast majority of Iran's gas reserves are undeveloped. Iran's largest natural gas field, the South Pars, is estimated to hold roughly 40% of Iran's gross natural gas reserves. It accounted for 40% of the Iranian natural gas production in 2012. Other major contributors are the Nar, Kangan and Tabnak fields. Nearly 80% of gross production came from non-associated gas fields. The remaining gross natural gas production was associated with oil—mainly from the Khuzestan, Ilam, and Kermanshah provinces, along with offshore oil fields.⁷²

The South Pars, together with its Qatar part, constitutes the largest natural gas field in the world. The field was discovered in 1990. According to the NIOC's subsidiary, the Pars Oil and Gas Company (POGC), responsible for the management of South Pars, the Iranian portion is estimated to contain some 14 trillion cubic metres (Tcm) of gas reserves and some 18 Bbbl of gas condensates. This amounts to roughly 7.5% of the world's gas reserves.⁷³ The South Pars is divided into 24 phases, 1 to 10 are functioning. Statoil, Eni and Total were responsible for the development of some of the phases. Phase 11, 13, 14 and 19 are expected to produce more than 50 MMcm/d each.

The Chinese company CNPC developed phase 11, a \$4.7 billion project, but according to Iranian media, CNPC pulled out in 2012.⁷⁴ The 12th phase of South Pars was inaugurated in March 2015. According to the Iranian Minister of Petroleum, Zanganeh, 'Iran's gas production capacity has gone up by 120 MMcm/d [in 2014], 68 MMcm/d of which have come from South Pars gas field phase 12'.⁷⁵ According to Zanganeh, 'Phase 12 will add 80 million cubic meters of gas and

120,000 bbl of gas condensate per day to the total gas production capacity of the country'.⁷⁶

Additionally, 'South Pars gas field Phases 15 & 16 and 17 & 18 yield 37 and 18 MMcm/d, respectively'.⁷⁷ Phases 15 & 16 and 17 & 18 should be inaugurated officially in late spring and early summer of 2015. According to the POGC, the objectives for Phases 15 & 16 and 17 & 18 are: producing more than 50 MMcm/d of natural gas, 80,000 barrels of gas condensate per day and an annual production of 1.05 million tonnes of liquid gas, propane and butane.⁷⁸ The development of South Pars is Iran's highest priority.

⁷² "Iran", EIA

⁷³ POGC website

<http://pogc.ir/Default.aspx?tabid=136>

⁷⁴ Rose, Adam, and Chen Aizhu. "UPDATE 2-Iran Oil Officials in Beijing to Discuss Oil Supplies, Projects." *Reuters*. April 7, 2015.

⁷⁵ "New Phases of South Pars Gas Field Coming Online Soon." *Shana Petro Energy Information Network*. March 17, 2015.

⁷⁶ *Ibid.*

⁷⁷ *Ibid.*

⁷⁸ Pars Oil and Gas Company website

Map.2. Iran's major natural gas fields



Source: EIA, Iran

The Kish field holds more than 1.868 Tcm (66 Tcf) of in-situ natural gas reserves and 514 million barrels of gas condensates. This field is probably Iran's second priority.⁷⁹ According to Abdolreza Haji Hossein Nejad, the director of Iran's Petroleum Engineering and Development Company, the gas field will start producing 25 MMcm/d in the next 12 months.⁸⁰ The development plan envisages three phases, a total production of 28 MMcm/d (1 bcf/d) of natural gas and 11,300 barrels of condensate per day.⁸¹

The North Pars field has approximately 1.415 Tcm (50 Tcf) of recoverable reserves of sour gas. According to EIA, the China National Offshore Oil Corporation (CNOOC) signed an agreement with NIOC to develop North Pars, which was

cancelled by Iran after CNOOC had paused its activities due to U.S. sanctions.⁸²

According to EIA, **the Lavan field's** recoverable reserves are approximately 187 Bcm (6.6 Tcf), with 62 million barrels of condensate reserves. Its first phase is expected to be completed by 2015-2016, with production of 21.237 MMcm/d (750 MMcf/d) of natural gas and 11,000 barrels of condensate. **The Forouz B field's** recoverable reserves amount to 707.921 Bcm (25 Tcf). It is expected to start production in 2017-18. It will be used for electricity generation for exports.

The Golshan and Ferdowsi fields hold 1.104 Tcm (39 Tcf) and 311.485 Bcm (11 Tcf) of recoverable natural gas reserves, respectively. The contracts for the development of these fields were cancelled.⁸³ **The Farzad B** is another gas field holding an estimated 613.909 Bcm (21.68 Tcf) of in-place reserves of which 5,946 MMcm (12.8

⁷⁹ "Iran Eyeing Early Production from Kish Gas Field." *Offshore Energy Today*. February 14, 2013.

⁸⁰ "Kish Gas Field to Produce 9 Bcm Gas/year." *PressTV*. July 7, 2015.

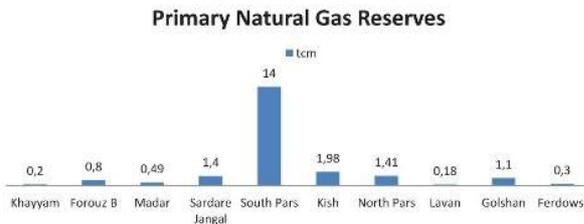
⁸¹ "Iran". EIA.

⁸² *Ibid.*

⁸³ *Ibid.*

Bcf) could be recovered. Oil and Natural Gas Corporation Videsh Ltd (OVL) operated the field until 2014 when due to delays Iran announced that it would put Farzad-B gas field on a list of fields it plans to auction.⁸⁴

Fig.5. Natural gas reserves of some of the key Iranian natural gas fields



Source: EIA, BP, found in Akhundzada, Emin, and Seray Özkan. "Iranian Energy Outlook." Caspian Strategy Institute. 2014.

Expectations:

Iran's Petroleum Ministry wants to attract major oil and gas players (especially European companies) for investment in Iran, according to Siamak Adibi. Iran's policy for gas pricing has been seen by the IOCs as problematic. In terms of foreign partnership, he expects that IOCs will be more interested to invest in the integrated export projects (LNG project) or integrated gas based petrochemical projects. Therefore, a good opportunity for new petrochemical joint ventures for production of methanol, ethylene and other products is expected.⁸⁵

For U.S. companies, as explained in the introductory Chapter, the sanctions will not be lifted with the implementation of the JCPOA. Any lifting of the investment barriers in the short-term is not expected. If the European companies are successful in their projects with Iran, there may be a high chance that U.S. companies will start lobbying for suspension of the U.S. sanctions on investments, according to Adibi.⁸⁶ Neil Quilliam, supporting a similar opinion, does not expect that to happen in the next 3 to 5 years, at least, pointing out that the attitude of the new

American President might also have an impact on these developments.⁸⁷

Table. 5. Iranian Gas Fields' Production capacity and expected competition years

Gas Field	Production capacity MMcm/d	Expected Completion year
SP 11	50.00	after 2025
SP 12	80.00	2015/16
SP 13	50.00	after 2020
SP14	50.00	after 2020
SP 15	50.00	2015/16
SP 16		
SP 17	50.00	2015/16
SP 18		
SP 19	50.00	
SP 20	50.00	up to 2020/23
SP 21		
SP 22	50.00	after 2020
SP 23		
SP 24		
Kish	28.00	2016/2020
Lavan	21.00	2015/2016
Foruz B		after 2020
Golshan		
Ferdowsi	14.00	2017/18
Farzad B		after 2025
Total increase of maximum	243 / 343	up to 2020
Total increase of more than	543	after 2025

Source: Authors table

Domestic policies and consumption

Domestic consumption

Until 2012, Iran was the third largest gas consumer in the world. According to BP, it currently ranks fourth in world.⁸⁸ Share of natural gas in Iran's primary energy consumption in 2013 was around 57%.⁸⁹ Natural gas is the country's primary fuel source to generate electricity, accounting for almost 66% of total generation in 2013.⁹⁰ Due to a high domestic demand, especially during the winter months, Iran had difficulties meeting its domestic needs and export obligations. Therefore, it started importing more

⁸⁴ Mokul, J and Singh, P. "India's slippery hold on Farzad-B gas field" *Business Standard*, July 16, 2015

⁸⁵ Adibi, interview.

⁸⁶ Ibid.

⁸⁷ Quilliam, interview.

⁸⁸ "BP Statistical Review of World Energy June 2015" bp.com/statisticalreview

⁸⁹ International Energy Agency (IEA) estimations

⁹⁰ Ibid.

gas from Turkmenistan and reducing gas re-injection volumes into the oil fields.

Table.6. Natural Gas Production and Consumption (2004-2014)

Billion Cubic Metres	Gas production*	Gas Consumption**
2004	96.4	98.7
2005	102.3	102.8
2006	111.5	112.0
2007	125.0	125.5
2008	132.4	134.8
2009	144.2	143.2
2010	152.4	152.9
2011	159.9	162.4
2012	165.6	161.5
2013	164.0	159.4
2014	172.6	170.2
Change 2014 over 2013	5.2%	6.8%

*Excludes gas flared or recycled. Includes natural gas produced for Gas-to-Liquids transformation.**Excludes natural gas converted to liquid fuels but includes derivatives of coal as well as natural gas consumed in Gas-to-Liquids transformation.

Source: Author's table based on BP Data (BP Statistical Review of World Energy, June 2015)

The total gas consumption of the country stood at 173.8 Bcm over the past Iranian calendar year, which ended on 20th March 2015. The household, commercial and small industries' gas consumption was 90 Bcm during this period, up by 2.1 Bcm against similar period a year before. In total, the NIGC supplied 50.26 Bcm of gas to power plants during 2014 corresponding to 137 MMcm/d of

gas. This is up by 15 Bcm year-on-year. Gas delivery to the industrial sector was 32.6 Bcm, or 89.4 MMcm/d.⁹¹

Maximilian Kuhn in "Enabling Iranian Natural Gas export Options" explains that natural gas in Iran is used predominantly for power generation, petrochemicals, gas re-injection into the declining oil fields, transportation and household usage.⁹² He points out that until 2035 the largest increase in natural gas usage is expected to come from the petrochemical sector. In line with the Iranian policy to support value-added products from natural gas—the industry is expected to be the largest natural gas consumer. Additionally, due to the lack of modernisation and inefficiency, a significant amount of gas is flared. The tendency that Kuhn suggests is that despite the rise of natural gas production, the vast domestic consumption will surpass the production levels.⁹³

Domestic policies

According to Bijan Khajepour, the gas utilisation strategy in Iran is based on 4 priorities:

- 1) Provide gas for domestic consumption to free up oil for exports
- 2) Inject gas into oil fields to increase oil production
- 3) Promote gas utilisation in domestic gas-based industries
- 4) Export remaining gas through pipelines and other methods.⁹⁴

A substantial part of the Iranian domestic policy has been the natural gas subsidies. Elham Hassanzadeh argues 'the low energy prices, due to government subsidies, have been one of the major impediments to controlling and rationalising

⁹¹ "NIGC Announces Gas Consumption Figures." *Shana*. March 16, 2015.

⁹² For detailed information about the Iranian natural gas sector see: Kuhn, Maximilian. *Enabling the Iranian Gas Export Options. The Destiny of Iranian Energy Relations in a Tripolar Struggle over Energy Security and Geopolitics*. VS Verlag Für Sozialwissenschaften, 2014. p.210-217

⁹³ Ibid.

⁹⁴ Khajepour, Bijan. "The Future of the Petroleum Sector in Iran." *Future of Iran Series.*, Legatum Institute (2013), 2.

domestic consumption'.⁹⁵ Another reason, according to Duero is that the government, very early on, prioritised and encouraged domestic gas consumption in order to have greater oil capacities for exports.⁹⁶

In terms of subsidies, there has been a tendency of revising this policy. The reform of 2010, with the Subsidies Reform Act, has been seen as the most decisive steps in this direction.⁹⁷ According to Hassanzadeh, the reform was relatively successful in its first year of implementation, but in the second and third 'had a drastic economic impact on the country'.⁹⁸ This also coincided with the tightening of international sanctions in 2012. In this regard, the reform neither helped to significantly reduce natural gas consumption, nor did it allocate additional investment funds for development of natural gas projects,' according to her.⁹⁹ As a consequence, despite having a massive increase of gas production in Iran, even faster rise of its domestic demand and low domestic gas prices have made Iran unable to export any significant amount of gas, according to Professor Stern.¹⁰⁰

Another challenge in front of gas exports is domestic elites' opposition. In Iran, it is believed that natural gas usage for re-injection into oil fields and for the petrochemical development may generate the highest economic returns for the Iranian government. In terms of using gas for EOR, the recovery factor of re-injected gas is usually 60-80% of injected volumes; hence, after oil recovery, 60-80% of the gas will be available for recycling, which means gas re-injection could be similar to large (albeit long term) gas storage for the country.

Additionally, Kuhn points out that the political pressure for allocating gas for EOR, reflects the economic rationale of much higher oil prices than the ones for the gas, when developing the oil

sector is more beneficial for Iran.¹⁰¹ As some of the petrochemical prices are indirectly related to the crude oil price, it also makes economic sense to export petrochemicals, if oil prices are high.¹⁰² Furthermore, allocating natural gas to the petrochemical sector creates a value added product and jobs. Therefore, the support for domestic allocation of natural gas has reflected a strong economic rationale.

The domestic gas export opposition group, according to Bijan Khajehpour, is 'led by some prominent MPs and former government officials' and regards exports of gas in its raw form as exporting development potential.¹⁰³ However, the representation of this opposition group in the Iranian parliament is considered to be no longer as powerful as it was 5-10 years ago.

Similar to the internal debate taking place in the U.S., the pro and against natural gas exports discussion in Iran encompasses different schools of thought and the complexity of the matter is not entirely transparent to the public, according to Umbach. Despite acknowledging that there are some interested parties domestically, he considers that the exports should not be overestimated at least in the short to mid term.¹⁰⁴ Regarding the course of the Iranian natural gas policy, Adibi suggests that in the short to mid term the Iranian gas strategy will remain unchanged—supplying gas to the domestic market, gas for re-injection into the oil field, and pipeline exports.¹⁰⁵

Pipelines and LNG exports

Existing Pipelines

Iran's domestic natural gas distribution infrastructure is based on a network of trunk-lines, whose development dates back to the 1960s. The system was subsequently extended and continues to be expanded. Iran's Gas Trunkline system (IGAT) is the state's core distribution system and with some additional regional pipeline links it covers all major demand centres.¹⁰⁶ The natural gas reserves in Iran are mostly concentrated in the

⁹⁵ Hassanzadeh, Elham. *Iran's Natural Gas Industry in the Post-Revolutionary Period Optimism, Scepticism, and Potential*, Oxford Institute for Energy Studies, Oxford University Press (2014), 107

⁹⁶ Duero, interview.

⁹⁷ Hassanzadeh. *Iran's Natural Gas*, 18

⁹⁸ Ibid. 118

⁹⁹ Ibid. 124

¹⁰⁰ 1st EUCERS/ISD/KAS Energy Talk 2015, KCL

¹⁰¹ Kuhn, *Enabling Iranian Natural Gas*, 211

¹⁰² Ibid. 222 (footnote 442)

¹⁰³ Khajehpour, "The Future", 8

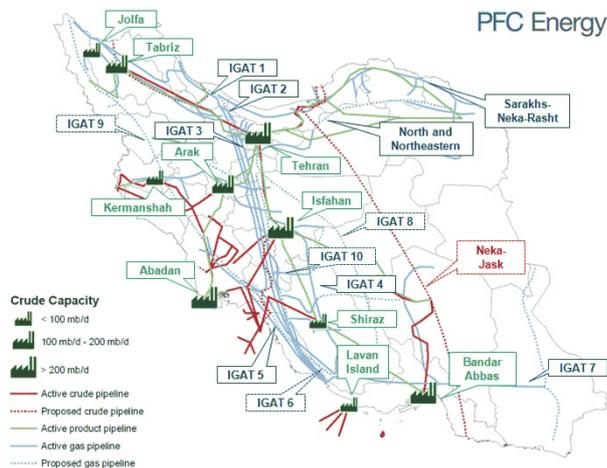
¹⁰⁴ 1st EUCERS/KAS/ISD Energy Talk 2015, KCL

¹⁰⁵ Adibi, interview.

¹⁰⁶ Kuhn, *Enabling Iranian Natural Gas*, 227

South of the country and the pipeline infrastructure aims to spread the capacity to the North. The efforts of Iranian state are orientated towards improving and extending its gas pipeline infrastructure.

Map.3. Iranian IGAT infrastructure



Source: EIA, Iran

Iran's natural gas exports are minimal. Iran 'accounted for less than 1% of global natural gas trade, in 2012'.¹⁰⁷ The exports are directed to Turkey, Armenia, and Azerbaijan. Turkey is the largest Iranian natural gas consumer (90% of Iran's exports).

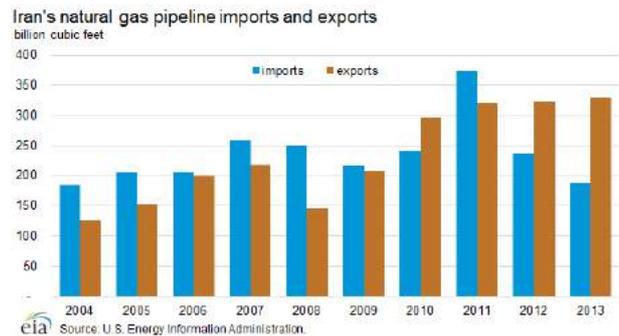
According to EIA, the natural gas for Armenia is used to produce electricity at the Yerevan power plant and in return, excess base-load electricity generated from the Armenian Nuclear Power Plant (ANPP) is exported to Iran. Iran and Azerbaijan exchange gas exports — Iran supplies the exclave of Nakhchivan via the Salmas-Nakhchivan pipeline and Azerbaijan exports to Iran's northern provinces via the Astara-Kazi-Magomed pipeline.¹⁰⁸ Due to the large domestic consumption of natural gas, Iran is a net importer of natural gas from Turkmenistan. The import pipeline capacity from Turkmenistan to Iran is 20 Bcm and from Azerbaijan to Iran is 10 Bcm, while Iran exports to Turkey (capacity 10.2 Bcm) and Armenia (capacity 2.3 Bcm).¹⁰⁹

¹⁰⁷ "Iran". EIA

¹⁰⁸ Ibid.

¹⁰⁹ "Market Overview - Iran - Oil And Gas Infrastructure - Q2 2015 2 April 2015." Business

Fig.6. Iran's natural gas pipeline imports and exports 2004-2013



Source: EIA, Iran

In April 2015, the managing director of the National Iranian Gas Company (NIGC), Hamid Reza Araqchi stated that increasing the export of Iran's natural gas is among the main goals of the Islamic Republic's Sixth Economic Development Plan.¹¹⁰ Iran exported 8%, or 1 Bcm, more natural gas during last Iranian calendar year than compared to a year before.¹¹¹ Additionally, the currently proposed and on-going pipeline projects would significantly increase Iran's gas export capacity to Turkey and could enable exports to Pakistan and India.¹¹² However, investing in the gas sector remains the vital precondition for Iran's natural gas export potential development, since the production is still insufficient to meet Iran's domestic needs.¹¹³

Pipeline Projects

Iran has planned and negotiated various pipeline projects within its neighbourhood. Due to the security situation in the region, the sanctions imposed on Iran and the lack of natural gas export capacity in Iran, as well as range of difficulties that have arisen between the projects' negotiating parties, the progress of the pipelines has been either very slow or non-existent.

The Iran-Iraq-Syria pipeline is a proposed pipeline exporting gas from Iran to Iraq and Syria. In August 2010, Iranian and Iraqi officials

Monitor International, *BMI Industry Insights - Oil & Gas, Middle East & Africa*, 2015.

¹¹⁰ "Iran Ready to Send Natural Gas to Kuwait via Iraq: Official." *PressTV*. April 12, 2015

¹¹¹ Ibid.

¹¹² "Iran oil and gas Q2 2015 2 April 2015", BMI

¹¹³ Ibid.

announced that they had taken steps towards establishing a pipeline that would run from Iran west through Iraq to Syria, with a capacity of 40 Bcm.¹¹⁴ Due to the lack of stability in the region, no development has been reported since then.

The Iran-Iraq pipeline is a pipeline project that aims at supplying Iranian natural gas to Iraq. According to some sources, the final goal is to deliver 25 MMcm/d of gas to Iraq, but it is expected to start at 7 MMcm/d or 9 MMcm/d. Others state that Iran plans to export 4 MMcm/d of natural gas to Iraq in 2015, which will be increased to 40 MMcm/d during summers.¹¹⁵ According to the Managing Director of NIGEC, Ali Reza Kameli, “[g]as exports to Basra will start from 5 MMcm/d and will reach 30 MMcm/d, a year after an agreement is finalised.”¹¹⁶ According to Siamak Adibi, Iran signed a contract with Iraq in 2013 to export up to 24.918 MMcm/d (880 mmscf/d) of gas to Iraq.

There is also a separate, initial agreement between Iran and the Basrah Provincial Council for a further 19.821 MMcm/d (700 mmscf/d) of gas imports from Iran. Iran and Iraq are in negotiations to finalise the second contract for gas exports to the Basrah Province over the next few months, as of August 2015. The Iran-Iraq gas pipeline is already in place, according to Abidi. However, the pipeline is not operational due to security issues and military conflict against the so-called Islamic State of Iraq and Syria (ISIS) on the Iraqi territories.¹¹⁷

The Iran-Kuwait Pipeline is a pipeline project for gas exports from Iran to Kuwait. There is an agreement signed between the two for the construction of a pipeline to transport gas from Iran's South Pars field to Kuwait, the export volumes of an annual 3.1 Bcm.¹¹⁸ In April 2015, the managing director of the National Iranian Gas Company (NIGC), Hamid Reza Araqi stated that “[i]t is possible for Iran to export natural gas to

Kuwait through Iraq and this can take place if a contract for gas exports is signed between Iran and Kuwait.”¹¹⁹ According to Adibi, the Kuwait discussions started and ended with disagreements over price before the oil prices collapsed, but he is positive that a satisfactory price for both sides can and will be reached.¹²⁰

The Iran-Pakistan-India export pipeline project (IPI) has been a gas export pipeline proposed for many years. Due to deteriorated security situation between India and Pakistan, the international sanctions and additional obstacles such as pricing, transit fees, and because gas transported through Pakistan would be too expensive for India, the project has not moved forward.¹²¹

The Iran-Pakistan export pipeline is a project gas pipeline, coming from Iran and going to Pakistan. An agreement between Iran and Pakistan was reached in 2009. In 2013, Iran announced that its section of the pipeline was nearly completed, but the Pakistani side of the project had not been completed mainly due to a lack of finance and the pressure, stemming from the sanctions. As of April 2015, some progress from the Pakistani side has been reported, as ‘Pakistan is negotiating with the China Petroleum Pipeline Bureau, a subsidiary of Chinese energy giant China National Petroleum Corporation, to build 700 kilometers of pipeline from the western Pakistani port of Gwadar to Nawabshah in the southern province of Sindh, where it will connect to Pakistan’s existing gas-distribution pipeline network’.¹²²

The Iran-India deep-sea pipeline has been a suggested gas pipeline since the 1990s.¹²³ It is said to be the deepest underwater transnational gas pipeline, also called the "Middle East to India Deepwater Pipeline (MEIDP).¹²⁴ In 2014, India

¹¹⁴ Ibid.

¹¹⁵ "Iran starts testing Iraq gas pipeline". *PressTV*, April 18, 2015.

¹¹⁶ "Iran ready to send natural gas to Kuwait via Iraq: Official," *Press TV*, 12 April, 2015

¹¹⁷ Adibi, interview.

¹¹⁸ Ibid.

¹¹⁹ "Iran ready". *Press TV*

¹²⁰ Adibi, interview.

¹²¹ Kuhn, *Enabling*, 244-245

¹²² Saeed, Shah. "China to Build Pipeline From Iran to Pakistan." *The Wall Street Journal (WSJ)*, 2015.

¹²³ Kuhn, *Enabling*, 241

¹²⁴ SAGE website, http://www.sageindia.com/index.php?option=com_content&view=article&id=48&Itemid=54

discussed the project, aiming at 31 Bcm of annual gas exports to India, with Iran and Oman.¹²⁵ Another idea is to connect it to Qatar, Iran, Iraq and Turkmenistan, while it also envisages to supply Natural Gas to Oman and UAE on its Pipeline Route to India. Three pipelines with a similar capacity are planned to be built in the next 10 years.

The route goes across the Arabian Sea, 1300 kilometers and in a maximum water depth of 3400 meters. The main idea is to circumvent the Pakistan's territory and connect directly to India. As of May 2015, negotiations between India and Iran are still on-going. South Asia Gas Enterprise Pvt. Ltd. (SAGE), promoted by the New Delhi based Siddho Mal Group, in Joint Venture with a UK-based Deepwater Technology Company, is working on the project.¹²⁶

The Iran-Oman pipeline project aims to export natural gas from Iran to Oman. In 2013, a Memorandum of Understanding (MoU) between the two states was signed and in 2014, an agreement for a pipeline that would connect the Iranian province of Hormuzgan to Sohar in Oman was set. Although Iran was expected to pump gas to Oman by 2015, as of April 2015 there are still issues that have not been resolved, such as the pricing of the gas and the exact route of the pipeline.¹²⁷ According to Adibi, Oman has the best political relationship with Iran in the region and the discussions have moved forward, as Iran has asked Oman to finance the project of some 200 kilometers of undersea pipeline. The pipeline is likely to be built by the Iran Oil Engineering and Construction Company (IOEC)—experts in building of such underwater pipelines.

The project is for 28.316 MMcm/d (1 bscf/d) of which 8.495 MMcm/d (300 mmscf/d) will go to Qalhat to produce 2 mmt of LNG. It is likely that Iran's gas will see an internal swap. All 28

MMcm/d (1 bscf/) will go to the domestic market and Oman will use its own gas to feed Qalhat on behalf of Iran. This is a package deal and prices have not been discussed nor finalised, but the project is proceeding, according to Adibi. Gas prices will likely be in the range of US\$4-6/mmBtu (million British Thermal Units) and toll processing in Qalhat will be at a nominal and friendly fee. This project is very likely to be completed by 2020.¹²⁸ The pipeline projects related to exports to Europe are examined in the fourth chapter.

LNG projects

Iran had ambitious plans to produce 70 million tonnes of liquefied natural gas (LNG) from the South Pars, North Pars, Ferdowsi and Golshan gas fields by launching six LNG production facilities, thus it signed contracts with European and Chinese companies for the development of its LNG projects, which were all cancelled by 2012.¹²⁹ Iran has started to develop 3 major LNG projects at the zone of Tombak: Iran LNG, Pars LNG and Persian LNG, close to major gas fields and other transportation infrastructure as IGAT-5 and 9. A total gas amount of 150 MMcm/d is passing this area.¹³⁰ However, due to the international sanction restrictions and consequent lack of technology, the Pars and the Persian LNG project were both cancelled, whereas Iran LNG has not been fully developed.

Map.4. Zone of Tombak



Source: Iran Liquefied Natural Gas co. Iran LNG

¹²⁵ Panda, Ankit. "India, Iran and Oman Open Talks On Deep Sea Gas Pipeline." *The Diplomat*, March 1, 2014.

¹²⁶ SAGE website, http://www.sageindia.com/index.php?option=com_content&view=article&id=48&Itemid=54

¹²⁷ "Iran-Oman gas project reportedly hits a snag" *Times of Oman*. April 13, 2015

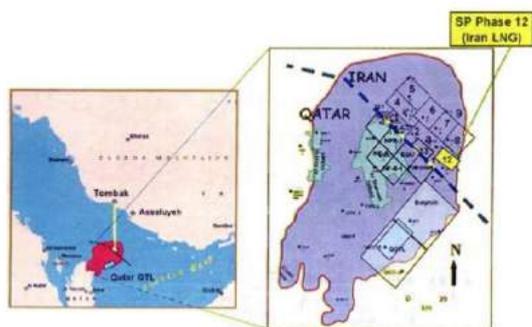
¹²⁸ Adibi, interview.

¹²⁹ "Iran exporting gas- how, where and when?" *Trend*. 1 April 2015

¹³⁰ Kuhn, *Enabling*, 250

Iran LNG project consists of the LNG plant, including storage and loading facilities. According to the Iranian Natural Gas Co., which is responsible for the Iran LNG project, two parallel LNG trains are provided to produce a total of more than 10.8 MMtpa (million metric tonnes per annum) of LNG. Allowance is made in the layout of the LNG Plant for future expansion up to 4 LNG trains. In addition to LNG, the process units will produce LPG, condensate and sulphur. Information from 2013, suggests that units 1 and 2 of the Power plant are operational, 3 is launched and 4, 5, 6 and 7 are running. Harbour and Jetty and the LPG Storage Tanks sections are almost finalised—with 83% and 94% overall progress, respectively. Liquefaction, Treating and Utility and Offsite are about half in their progress.¹³¹

Map.5. Iran LNG



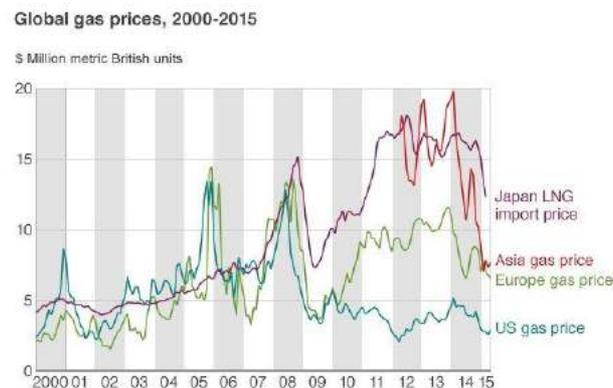
Source: Iran Liquefied Natural Gas co. IRAN LNG

Expectations:

According to B. Zanganeh, the determining factor for Iran to choose a destination for its gas exports will be the price.¹³² European gas prices are lower than the Asian prices, but it should be mentioned that recently the gap between the two has shrunk (see Fig.9.). Additionally, Europe's energy market is stagnating and Asia's is expanding. In this regard, Zanganeh points out that Europe will

come only after the regional and Asian orientated gas projects are developed.¹³³

Fig.7. Natural gas prices, 2000-2015



Source: Bloomberg, Argus LNG

BBC

Source: Bloomberg, found in Anderson, Richard. "Iran looks to energy reserves for post-sanctions influence," *BBC News* July 5, 2015

Lower oil prices have opened the door for gas exports. The pipeline export policy is the cornerstone of Iran's gas export policy, according to Siamak Adibi. Iran is seriously looking at the pipeline export options to Oman, the UAE, and Kuwait. IOCs might be interested in investment in the Iran-Kuwait project. Once the political tension with Saudi Arabia eased, a Bahrain pipeline discussion may take place, but it is not on Iran's priority list, according to him.¹³⁴

Other pipeline export projects under discussion are for Europe to compete against Russian gas supplies, a deep underwater gas export project to India, as well as the Pakistan to China pipeline and these are non-starters and more pipedreams than pipelines, according to Adibi. This is because they do not work, not just because of logistics, but because they do not make economic sense, according to him. Pakistan's pipeline is ready and waiting at the border pending political will and infrastructure in Pakistan. No quick start up is likely, but the gas will flow at some point in time.¹³⁵

¹³¹ "Location of the Facility." Iran Liquefied Natural Gas Co. <http://www.iranlng.ir/en/our-project/location-of-the-facility> Accessed: August 15, 2015.

¹³² "Znaganeh interview (English)"

¹³³ Ibid.

¹³⁴ Adibi, interview.

¹³⁵ Ibid.

According to Professor Stern, Iran is unable to export any significant amount of gas at least until 2030. If the sanctions are lifted, the domestic issues resolved and significant foreign investments made, it will still take 20 years for Iran to emerge as a major gas exporter. Within 10 to 15 years, Iran most probably will export modest amounts of natural gas to its neighbour, with Iraq and Pakistan being the most realistic destinations, according to him.¹³⁶

Due to the domestic gas shortage, Iran might not even be able to fulfil its plans to export to Iraq and Oman, particularly during the winter months, according to Dr Umbach. Additionally, sanctions lifting will be a gradual process, which will not have an immediate effect on the gas exports. Additionally, Dr Umbach envisages that with the remaining domestic challenges it would take approximately 5 years to have larger Iranian gas exports.¹³⁷

According to David Jalilvand, although Iran benefits from domestic gas allocation, exporting gas might have strategic advantage for Iran, as it creates stronger relations with its customers, making gas exports a more attractive idea to the foreign policy makers in Iran. The Iranian energy industry would also benefit from the higher and stable income from the foreign consumers, in contrast to the lower and delayed payments of the domestic ones. In the upcoming years, no major export volumes except for small ones to Iraq and perhaps Oman and Pakistan.¹³⁸

Neil Quilliam points out that European companies, such as Total and Shell are already involved in LNG projects in Iran's neighbour Qatar.¹³⁹ In terms of LNG, there is very high chance Iran to involve a new foreign, European, company in Iran LNG project, according to Adibi. Iran has chosen not to pursue LNG export projects beyond the present Iran LNG where around US\$3 billion has already been spent to build port facilities, tank storage, and all necessary infrastructure. What remains to be done is the liquefaction plant which requires U.S.

technology.¹⁴⁰ Iran LNG, at some 10 MMmt (million metric tonnes), is likely to be completed around 2020 with possible foreign partners or marketed directly by Iran.

On the LNG front, two other options are being also considered. Utilization of Qalhat LNG in Oman, where 2 million tonnes of spare capacity exist, as well as the possible use of Das Island, Abu Dhabi, after the completion of the ADGAS-TEPCO contract in late 2018. In the long term, there may be still room for new LNG projects, but this may have lower priority at the moment, according to Adibi. Iran may also introduce few small scale FLNG projects.¹⁴¹

Finally, as Arash Duero points out, natural gas exports through the form of electricity should not be underestimated.¹⁴² After the subsidy reform and subsequent price corrections consumption decreased, 'while overall power generation has grown, allowing Iran to export electricity to neighbouring markets'.¹⁴³ Iran exported 11.054 billion kilowatt hours of electricity to its neighbouring countries, for the Iranian year ending on 20 March 2013, a 29 per cent rise year on year.¹⁴⁴ Iran has its own capabilities in constructing power plants, according to Khajehpour, which makes the process of adding value to gas to produce electricity independent from foreign technology. Similarly, Iran has its own capacity to construct pipelines, whereas the other forms of adding value to gas (petrochemicals, liquefied natural gas or LNG, gas to liquids or GTL as well as other gas-based industries) would require foreign involvement.¹⁴⁵ Lack of access to foreign technology was determinative during the sanctions.

Gas balance and export scenarios

As analysed in the previous section, with successful realisation of some of the gas projects within the time framework provided in Table.5. Iran may increase its production by a maximum

¹³⁶ 1st EUCERS/ISD/KAS Energy Talk 2015, KCL

¹³⁷ Ibid.

¹³⁸ Ibid.

¹³⁹ Quilliam, interview.

¹⁴⁰ Adibi, interview.

Ibid.

¹⁴² 1st EUCERS/ISD/KAS Energy Talk 2015, KCL

¹⁴³ Khajehpour, "The Future of the Petroleum Sector",

4

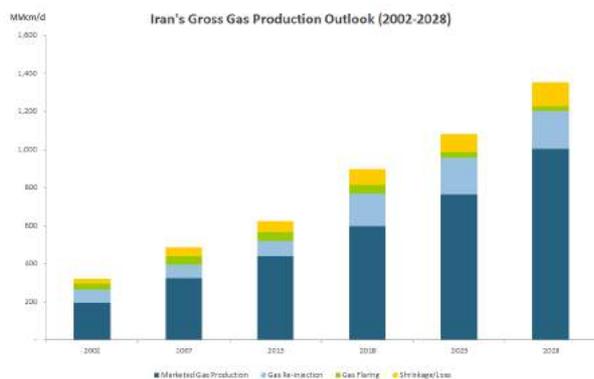
¹⁴⁴ Ibid.

¹⁴⁵ Ibid., 7

additional 343 MMcm/d. by 2020 and with a maximum additional 543 MMcm/d after 2020. This means that up to 2020 the total production may reach approximately 1000 MMcm/d and after 2023 it may rise up to approximately 1,150 MMcm/d or even more.

Figure 8 shows a potential scenario for production growth, where the gross gas production as shrinkage and loss is approximately 9%; the flaring is reduced by 18 MMcm/d (660 mmscf/d); and there is an increase in gas re-injection by a maximum additional 28 MMcm/d.¹⁴⁶

Fig.8. Iran's Gross Production outlook (2201-2028)



Source: Author's table

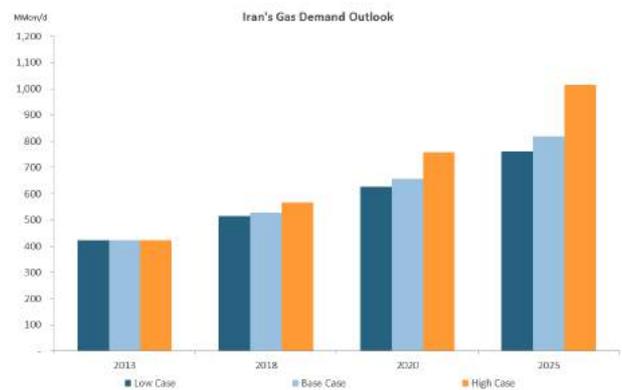
This forecast is based on the assumption that Kish and Lavan field will start to be operational in 2016 and will have reached their full capacity by 2020; and South Pars Phases 12, 15 & 16, and 17 & 18 are fully completed on time (by 2016 or max. by 2017). A less optimistic scenario would assume that the completion of Kish and Lavan fields would be after 2020.

Three scenarios for the consumption growth: a high-6% (corresponding to the growth rate for 2013-2014 see Table.6.); low-4% and base growth rate-4.5% are presented on the figure below (see Fig.9).

Considering the base case scenario of 4.5% growth of consumption, there will be "free" gas capacity of about 70MMcm/d after 2018, more than 100MMcm/d after 2020, and more than 180 MMcm/d after 2025 see Fig.10. If Iran

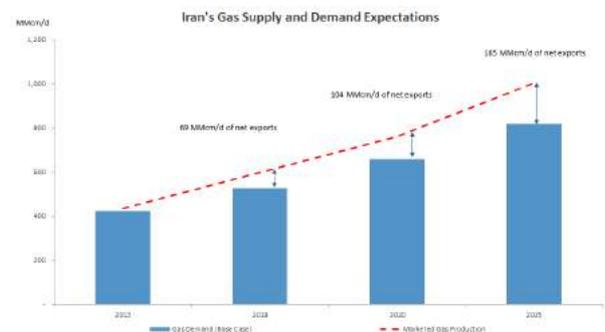
successfully realises its gas export projects in its neighbourhood (Iraq, Oman, UAE, Kuwait and Pakistan projects) and increases the current exports to Turkey, Armenia and Azerbedjan, Iran will have gas capacity of more than 50 MMcm/d for LNG, only after 2025. If Iran plans to allocate its free gas to LNG projects and increase the capacity of the pipelines that it has in the region, there might not be much spare capacity for exports to Europe.

Fig.9. Iran's Gas Demand Outlook



Source: Author's table

Fig.10 Iran Gas supply and demand expectations



Finally, in case if there is not any decrease in gas demand and domestic consumption continues its growth by an average of 6%, Iran will not be able to export much or any gas. European companies can help Iran to improve energy efficiency especially in the power and industrial sectors and to save more gas for exports. In a longer term, this gas can be sold to Europe at a discounted price vs. other export projects to Europe.¹⁴⁷

¹⁴⁶ Estimations provided by Siamak Adibi

¹⁴⁷ Adibi, interview

Conclusion

The review of the Iranian energy sector shows that despite having vast energy reserves, the sanctions, lack of investments, and subsequent lack of foreign technology, large domestic consumption and subsidies, especially in terms of natural gas, hampered Iran's export potential. However, in spite of the difficulties, Iran has continued to develop its energy sector, especially gas production. Iranian official statements show that Teheran has ambitious plans for its re-engagement on energy markets. After lifting of sanctions, improving the investment climate in the state is the second important precondition for attracting foreign companies back in Iran and developing its energy sector further. The next Chapter aims to review the pre and post-revolutionary management of the Iranian energy sector, in order to provide a general understanding of the political system and domestic climate, in relation to foreign investments in the energy industry.

Pre and post revolutionary management of the Iranian energy sector

Pre 1979 revolution period

The roots of the 1979 Iranian Revolution date back to the Qajar dynasty (1785-1925). During the so-called 'Great Game' the powerful actors of the time — the British Empire and Russia — competing for influence on the stage of international relations, had strategic, political and later commercial interests in Persia. To increase their presence in Teheran, the British Empire and Russia involved in the exploration and development of Iran's energy potential. Using investments in Iran's energy sector as a tool for extending their influence in the state, their presence became gradually regarded by Iran as

foreign powers' attempt to gain control over the state and its resources.

This perception, built for decades, was further strengthened, when it became a slogan of the Islamic Revolution of 1979. Consequently, Iran's fear of foreign domination and resentment of what Iran sees as self-interested nature of the IOCs were reflected in the Iranian investment framework, by limiting any possibility for foreign interference in its energy sector. The concession period and the consequent economic and political developments in Iran can be regarded as examples of what Iran would probably try to prevent from happening again.

Concessions period

In 1872, Nasser al-Din Shah Qajar (King of Persia from 1848 to 1896) awarded Baron Julius de Reuter 'a monopoly over virtually all of Iran's economic and financial resources'.¹⁴⁸ The so-called "Reuter Concession", according to Lord Curzon, the British Foreign Secretary at the time was "the most complete and extraordinary surrender of the entire industrial resources of a kingdom into foreign hands that has probably ever been dreamt of, much less accomplished, in history".¹⁴⁹ This Concession was not as successful as expected, but Baron de Reuter, under another concession formed the Imperial Bank of Persia, the predecessor of today's HSBC bank.¹⁵⁰

The Shah became debtor to the bank, as he was forced to take a loan from it, to pay an indemnity to a British firm, after cancelling a notorious Tobacco concession with the latter, due to a public outrage in Iran.¹⁵¹ This marked the beginning of a period in Iran, associated with foreign debts and concessions with terms largely

¹⁴⁸ Bill, James A. *The Eagle and the Lion: The Tragedy of American-Iranian Relations*. New Haven: Yale University Press (1988). 4.

¹⁴⁹ Heptulla, Najma. *Indo-West Asian Relations: The Nehru Era*. New Delhi: Allied Publishers, (1991). 60.
Kinzer, Stephen. *All the Shah's Men: An American Coup and the Roots of Middle East Terror*, Hoboken, N.J.: J. Wiley & Sons, (Canada, 2003), 2

Issawi, Charles. "European Economic Penetration." in *The Cambridge History of Iran*, edited by Avery, P., Hambly, G. R. G. and Melville, C. Cambridge: Cambridge University Press, (1991)., 593

¹⁵⁰ "HSBC's History." HSBC
<http://www.hsbc.com.hk/1/2/about/home/hsbc-s-history> Accessed August 20, 2015.

¹⁵¹ Kuhn, *Enabling*, 267-268

favouring foreign investors. Iranians' gradual disapproval of the royal dynasty's policy later led to the 1906 Constitutional Revolution and subsequent establishment of the Iranian constitutional government responsible for taking foreign loans and contracting concessions.

The concessions took place in an atmosphere of international competition between the British Empire and Russia for spheres of influence in Asia and the Middle East. In this regard, the two international powers engaged with Iran's energy and other sectors, not only for economic profits, but also with the strategic goal of enhancing their leverage in the region. In this context, concessions in Iran were backed by the governments of the investors' home states. This was the case with the D'Arcy's concession of 1901.

William D'Arcy was granted a 60 years petroleum exploration, production rights and pipeline construction monopoly over the entire country, without the Northern provinces, which were in Russian sphere of influence at that time.¹⁵² Iran received 16% of the operating companies' net annual profits.¹⁵³ "The first oil" of British Petroleum (BP today), which was then the Anglo-Persian Oil Company—APOC (later Anglo-Iranian Oil Company – AIOC), was extracted in Persia, with the development of the D'Arcy concession.¹⁵⁴

In 1914, the British government became the major shareholder of APOC. According to a contract between the British government and APOC, two British representatives were allowed in the board of directors, so they were able to veto any decision that were against the British interests.¹⁵⁵ Additionally, a contract between APOC and the British Admiralty secured fixed prices of oil supply to the Admiralty for 30 years.¹⁵⁶ Whereas,

in commercial relations both parties are expected to mutually benefit from their relations, in the case of the Iranian oil explorations of the time, the perception that another state's national interests were tolerated, started being persistent in Iran's collective consciousness.

The first explicit disagreements between Iran and APOC arose in regard to a renegotiation of the royalties and over the terms of the D'Arcy concession. In 1933, after disagreements between the APOC and Reza Shah (1926-1941), who founded the Pahlavi dynasty, by deposing the last Shah of the Qajar dynasty, a new 60-year concession, with changed terms, was signed. Although the terms of the new contract did not fully satisfy Iran's requirements, some aspects were significantly improved, such as reduction of the area, cheaper oil for Iran and cancellation of the exclusive right of transportation of oil.¹⁵⁷

In the following years, the Shah and APOC continue having disagreements, until 1941, when Iran was occupied by the allied powers of the Soviet Union and Britain, and Reza Shah was forced to abdicate in favour of his son Reza Shah Pahlavi (1941-1979). The new Shah was considered at that time to be more favourable to the great powers' interests. The period of occupation further strengthened Iran's negative perception towards any foreign presence on its territory.

Nationalisation

In the mid-20th century, Mohammad Mosaddeq, Chairman of the Oil Committee of the Iranian Parliament and later Prime Minister, introduced a motion for nationalisation.¹⁵⁸ This eventually led to the nationalisation of AIOC and its transformation into the National Iranian Oil Company (NIOC). In 1951, Iran became the first Middle Eastern country to nationalise its oil industry.¹⁵⁹ Mosaddeq became the voice of the Iranian people, as according to Garvin and Hambly, he 'subordinated what many consider a

¹⁵² Shahri, Nima Nasrollahi. "The Petroleum Legal Framework of Iran: History, Trends and the Way Forward." *The China and Eurasia Forum Quarterly* 8, no. 1 (2010), 113.

¹⁵³ Bakhtiari, Ali Morteza Samsam. "OPEC'S Evolving Role: D'Arcy Concession Centennial and OPEC Today - an Historical Perspective." *Oil and Gas Journal* 99 (2001).

¹⁵⁴ "First Oil." BP website. Accessed August 23, 2015. <http://www.bp.com/en/global/corporate/about-bp/our-history/history-of-bp/first-oil.html>.

¹⁵⁵ Malek, Dr. Mohammad. "Oil in Iran between the Two World Wars." Iran Chamber Society.

¹⁵⁶ Ibid.

¹⁵⁷ Malek, "Oil in Iran"

¹⁵⁸ National Iranian Oil Co. "Our History." National Iranian Oil Company. Accessed August 23, 2015.

¹⁵⁹ Waqas, Muhammad. "Joint Operating Agreements." *Oil & Gas Financial Journal*. October 9, 2014.

realistic appraisal of what was politically possible and economically desirable to a deeply ingrained sense of wrongs which, he, with so many others, felt that Iran had suffered at the hands of foreign exploiters.¹⁶⁰

In response to these domestic developments, 'Britain led worldwide boycott against Iranian crude',¹⁶¹ followed by a British-American intelligence operation that helped remove Mosaddeq and reinforce the rule of the Mohammad Reza Shah Pahlavi (1941-1979).¹⁶² According to Garvin and Hambly, '[f]or Iranians of all political persuasions, whether pro- or anti-Shah, the coup of 19 August 1953 confirmed a long-held conviction, that the source of all effective political action was to be sought in the machinations of foreigners'.¹⁶³

Iran being under the authority of the Shah enabled the British to renew their participation in the Iranian energy sector. This time, the U.S. participated with a share and the Iranian state remained the owner of the resources through the NIOC. With the 1954 Consortium agreement, a consortium, later transformed into the Iranian Oil Participants Ltd (IOP), in which a British company (later BP), Gulf Oil (later Chevron, 8%), Royal Dutch Shell (14%), and Compagnie Française des Pétroles (later Total S.A., 6%) and the four Aramco partners [Standard Oil of California (SoCal, later Chevron), Standard Oil of New Jersey (later Exxon, then ExxonMobil), Standard Oil Co. of New York (later Mobil, then ExxonMobil), and Texaco (later Chevron), each holding an 8% stake in the holding company]¹⁶⁴ participated, was formed to operate in the energy sector on behalf of the NIOC.¹⁶⁵

In 1957, Iran issued its first Oil Law, establishing the legal basis for participation agreements, which 'paved the way for the signing of agreements [participation formula 50% by the NIOC and 50% by the foreign company] to carry out activities outside the area where the consortium operated'.¹⁶⁶ In 1957, the first joint venture (JV) contracts were signed by a subsidiary (Agip) of today's Eni in Egypt and Iran.¹⁶⁷ This happened in an atmosphere when the oil rich Middle Eastern countries started renegotiating their consortium agreements and began considering forms of Participation Agreements (PAs). This later led to introduction of Joint Operation Agreements (JOA).¹⁶⁸

Although the Consortium agreement was not considered to be very beneficial to Iran, in fact, in the period of 1954 to 1977, and especially in the 1970s when the oil prices were high,¹⁶⁹ the Consortium contributed greatly to the development of the Iranian energy sector.¹⁷⁰ In the same period, natural gas started being exported. In mid 1960s, the first Iranian gas trunk line (IGAT1) to the USSR was constructed.¹⁷¹

The Oil law from 1957 was revised in 1974. The 1974 Petroleum law came as a reflection of the 1973 oil shock and attempted to secure 'a greater proportion of the resource rent for Iran'.¹⁷² The 1974 Petroleum Law practically set the principles of the post-revolutionary BBCs,¹⁷³ forbidding any

¹⁶⁰ Garvin, R. and Hambly, G. "The Pahlavi Autocracy: Riza Shah 1921-1941" in *The Cambridge History of Iran: Volume 7*, edited by Avery, P, Hambly, G., and Melville, C. Cambridge: University Press (1991). 225.

¹⁶¹ Kuhn, *Enabling*, 286

¹⁶² Garvin, R. and Hambly, G. "The Pahlavi Autocracy: Muhammad Riza Shah 1941-1979" in *The Cambridge History of Iran: Volume 7*, edited by Avery, P, Hambly, G., and Melville, C. Cambridge: University Press (1991), 263

¹⁶³ *Ibid.*, 264

¹⁶⁴ Garvin and Hambly. "The Pahlavi Autocracy: Muhammad Riza Shah 1941-1979", 665

¹⁶⁵ "Oil Agreements in Iran." *Encyclopedia Iranica*.

¹⁶⁶ National Iranian Oil Co. "Our History." NIOC website, History, under the section Oil Bills and Company Agreements

¹⁶⁷ Waqas, Muhammad. "Joint Operating Agreements." *Oil & Gas Financial Journal*. October 9, 2014.

¹⁶⁸ *Ibid.*

¹⁶⁹ In 1973 OAPEC (Organization of Arab Petroleum Exporting Countries) started the embargo in response to the United States involvement in the Yom Kippur War. The price of oil from \$3 per barrel more than tripled.

¹⁷⁰ Ferrier, Ronald. "The Iranian Oil Industry." in *The Cambridge History of Iran Vol. 7*, Edited by Avery et al. Cambridge: Cambridge University Press, (1991), 676

¹⁷¹ Hassanzadeh, *Iran's Natural Gas*, 13-15

¹⁷² Shahri, Nima Nasrollahi. "The Petroleum Legal Framework of Iran: History, Trends and the Way Forward" *China and Eurasia Forum Quarterly*, Volume 8, No. (2010), 123

¹⁷³ Kuhn, Maximilian, Jannatifar, Mohammad, "Foreign direct investment mechanisms and review of Iran's buy-back contracts: how far has Iran gone

ownership rights and only allowing foreign companies to invest in the full cycle of the upstream oil sector operations, including exploration, development and production operations, through service contracts with high risks.¹⁷⁴

If operations were not commercial, 'the companies could not ask for reimbursement of the investment they had made...But if they reached oil, they had to hand over the discovered field to National Iranian Oil Company and reimburse the investment in 10-year instalments and then deduct them from their payments for crude oil they purchased.'¹⁷⁵ The understanding of the 1974 Petroleum Law principles is important because, according to Kuhn and Jannatifar, post-revolutionary Iran, 'based on the rejection of the Shah and his policy', would have 'difficulties accepting a more liberal approach to foreign investments than the one during the reign of the Shah'.¹⁷⁶

During the ruling of the Shah, in many aspects—production, exports, development of the Iranian petrochemical industry—Iran's energy sector reached significant heights.¹⁷⁷ The oil revenues enabled the Shah to implement some of his reformist ideas, but at the same time, they made the state highly dependent on oil revenues. Consequently, in the second half of the 1970s the decline of the oil revenues affected all the sectors of the Iranian economy. The decreased oil exports deepened the economic crisis in Iran, which eventually led to the fall of the Shah's regime.

For many, according to Ferrier, the Shah was seen as 'the puppet of Western, primarily U.S., interests, which had directly intervened to overthrow the legitimate government of Iran and to restore him to his throne in the pursuit of their

own ends'.¹⁷⁸ In this context, the Shah's attempts to modernise Iran through the so-called "White Revolution", which in fact led to economic crisis,¹⁷⁹ were seen by the Iranians as diminishing Iran's national identity and humiliatingly "westernising" it.

In the present Constitution of the Islamic Republic of Iran, the "White Revolution" is defined as "the American conspiracy...which was a step intended to stabilise the foundations of despotic rule and to reinforce the political, cultural, and economic dependence of Iran on world imperialism".¹⁸⁰ Demonization of modernisation, in general, might have created psychological barriers influencing more conservatively orientated people and their understanding of modernisation as process.

Factors such as foreign involvement in the state's affairs and energy sector, corruption and lack of respect of human rights, deep economic crisis and divergences between the factions led to a point where the atmosphere in Iran was favourable for a fundamental change. Ayatollah Khomeini led the Islamic Revolution of 1979, by 'denouncing the godless tyranny of the Shah, agent of United States and Israeli imperialism'¹⁸¹—slogans that became the leitmotif of the post-revolutionary Iran.

History of foreign involvement in Iran's energy sector and parallel into its domestic politics, have made Iran perceive granting access to foreign companies to its energy sector as inevitably leading to dependence and foreign control. Preventing the state from same fate became a starting point of Iran's laws that regulate foreign investments in Iran's oil and gas industry. Denying any foreign control became one of the core motives for Iran's persistent protection of natural resource national ownership.

and how far may it go?", *Journal of World Law and Business*, Vol.5, No.3, (2012), 209

¹⁷⁴ "Our History," National Iranian Oil Co.

¹⁷⁵ Ibid.

¹⁷⁶ Kuhn & Jannatifar, "Foreign direct investment", 209

¹⁷⁷ For detailed analysis of the development of the Iranian energy sector during the ruling of Shah Reza Pahlavi: Ferrier, Ronald. "The Iranian Oil Industry." in *The Cambridge History of Iran Vol. 7*, Edited by Avery et al. Cambridge: Cambridge University Press, (1991)

¹⁷⁸ Ferrier, "The Iranian Oil Industry,"264

¹⁷⁹ For the detailed analysis of the Iranian Economy during the Pahlavi Dynasty: Maclachlan, K.C.

"Economic Evolvement 1921–1979" in *The Cambridge History of Iran Vol 7*. Edited by Avery et al.

¹⁸⁰ "Iran Chamber Society: The Constitution of Islamic Republic of Iran." Iran Chamber Society. Accessed August 23, 2015.

<http://www.iranchamber.com/government/laws/constitution.php>.

¹⁸¹ Garvin and Hambly. "The Pahlavi Autocracy: Muhammad Riza Shah 1941-1979",.290

Post 1979 revolution context

In 1979, Mohamad Reza Shah Pahlavi left Iran and went into exile. Ayatollah Ruhollah Khomeini (1979-1989), hugely supported by the people, led the state as a Supreme Leader. By a national referendum, a new constitution was approved, marking the beginning of the Islamic Republic of Iran.

Political structure

Iran has religious and republican (elected bodies), while it also has formal and informal structures.¹⁸² According to Kuhn, the formal bodies consist of constitutionally determined institutions divided in three groups: religious supervisory bodies, republican institutions and religious foundations. The informal bodies are represented by factions, personal ties and circles of influence surrounding the domestically influential individuals, as well as other non-institutional actor.¹⁸³ The interference, sometimes overlap, of all the formal institutions, along with the influence of the factions and different groups from the elite complicate Iran's political system and decision making becomes difficult to be predicted.¹⁸⁴

The leading role of the Supreme Leader is undeniable. He has key advisory institutions that are involved in the decision-making under his direct control. The Supreme Leader, part of the group of the religious supervisory bodies, presently Ayatollah Khamenei (1989-present), the successor of Ayatollah Khomeini, is the most powerful and influential figure in Iran, who determines the overall domestic and international policy course of Iran. He approves all foreign policy decisions, but does not take them alone. Other key religious bodies that are involved in the decision-making and advisory process are the Assembly of Experts, the Expediency Council, and the Council of Guardians.

The President, a republican body, is said to be the other powerful person in Iran's political system. His influence, however, is determined largely by the person in charge of that position, himself and the degree of freedom that the Supreme Leader decides to grant him.¹⁸⁵ The recent history of Iran has shown different approaches towards the international relations undertaken by different presidents. For example, the more radical position of President Ahmadinejad contrasts with the moderate one of Present President Rouhani. The President position is also dependent on numerous configurations of the domestic politics.

The Parliament (the Majlis), the Judiciary, the Supreme National Security Council and the Strategic Council of Foreign Relations are part of the republican institutions. An important characteristic of the system is that 'major decision makers hold multiple posts', where governmental officials also head state-run companies.¹⁸⁶ In general, for the elected institutions in Iran, as Kuhn argues, the power is not vested in the positions, but it 'lies with individuals, their personal networks, and power relations'¹⁸⁷ and they become a 'playing field on which other informal players interact'.¹⁸⁸

During the 1980s, after the Islamic Revolution, the clerics were the dominant group to influence the politics in Iran.¹⁸⁹ Other domestic actors such as bonyads (foundations) also influenced the developments in the energy sector. The 1990s were considered the era of the bonyads. The bonyads are semi-private organisations that have significant influence in almost all the spheres of the Iranian domestic sector.¹⁹⁰

¹⁸² For analysis of the Iranian Institutions and domestic dynamics, in regard to their influence on the Iranian energy sector: Kuhn, M. *Enabling the Iranian Gas Export Options*, 112- 198

¹⁸³ Ibid.117

¹⁸⁴ For analysis of the Iranian Institutions and domestic dynamics, in regard to their influence on the Iranian energy sector: Kuhn, M. *Enabling the Iranian Gas Export Options*, 112- 198

¹⁸⁵ Hassanzadeh, *Iran's Natural Gas*, 4

¹⁸⁶ Marcel, Vale, and John V. Mitchell. *Oil Titans National Oil Companies in the Middle East*. London: Chatham House (2006). Quoted in Kuhn, *Enabling*, 204.

¹⁸⁷ Kuhn, *Enabling Iranian Natural gas*, 116

¹⁸⁸ Ibid. 117

¹⁸⁹ Ibid. 147

¹⁹⁰ Mahdavi, Paasha. "Oil, monarchy, revolution, and theocracy: a study on the National Iranian Oil Company (NIOC)" in *Oil and Governance. State-Owned Enterprises and the World Energy Supply*, edited by David G. Victor, David R. Hulst and Mark C. Thurber Cambridge University Press 2011:234-279, 253

According to Kenneth Katzman, created as charitable trusts, the bonyads consist of cleric, current and former governmental officials, with privileges such as tax exemption and others. They have monopolistic control over import and distribution of various categories of items, and are receiving and exercising non-transparent control over the distribution of significant amounts of state money or privileges when there is privatisation.¹⁹¹ The latest privatisation scheme was halted by President Rouhani in 'an attempt to end the negative developments that arose from the opening of the economy to private actors under his predecessors (where from privatisation benefited parastatal businesses)'.¹⁹²

Iran's military and security forces also have a substructure of institutions and divisions that further complicate the political system. Their influence on the state's economy, in particular the one of Iranian Revolutionary Guards Corps (IRGC), has increased during the presidency of Ahmadinejad.¹⁹³ IRGC are associated with strong support of the ideas embedded in the Revolution.

IRGC, using their role in the political life of the state as a tool, have acquired important shares in the state's economy.¹⁹⁴ Khajehpour suggests that in the 'overshadowed by the government' energy sector the increasing participations of the IRGC and other private companies that have 'extensive expertise in construction, though less in the petroleum sector specific technologies', was largely a result of the sanctions and shaped the current decline of the energy sector.¹⁹⁵

Influential factors

The internal dynamic is further complicated by competition between the factions. Although there are certain lines that the different parties follow, the actual dynamic is within the political groupings. The factions—conservative, pragmatist and reformist, as Kuhn argues 'fight over power,

influence and economic resources' and 'their different policies are mainly not formulated out of different ideologies, but from the different economic base and power clout each factions depends on...Thus the power clout of each political faction is based upon different financial sources and revenues,' making maximising their gains the centre of their goals.¹⁹⁶ Additionally, the 'oil and gas export revenues being an important factor in the financial viability of the Iranian government', leave the petroleum sector solely in the hands of the state, which 'has led to temptations to utilise this industry for other purposes'.¹⁹⁷

Apart from the state institutions and their officials, it is also important to take into consideration the public opinion and the way it is reflected in the competition among the different factions. The public support of the government is important for the ruling elite because it could be fundamental to the stability of the political system in place. The factions, along with the circles of influence that surround them, create a complicated and hard to predict system of interdependencies, which drives the internal dynamics of almost all of Iran's domestic politics. Therefore, better understanding of the complicated processes taking place in Iran, involves analysis of both macro- and micro-level dynamics.

Energy sector institutions

In the late 1990s, the Iranian oil sector was restructured. This led to a further politicisation of the energy sector, according to Paul Stevens. A separate head of NIOC was appointed and NIOC was divided into numerous sub companies. This vague responsibility holding resulted in more complicated internal disputes, especially over issues regarding foreign investments and privatisation.¹⁹⁸

The parliament is the institution that has the authority to approve or block energy related decisions.¹⁹⁹ The energy sector in Iran is supervised by the Supreme Energy Council composed of the Minister of Petroleum and other

¹⁹¹ Katzman, Kenneth. "Overview of Iran's Political Economy." *Iran Watch*. July 25, 2006.

¹⁹² Stevens, Paul. "Prospects for Iran's Oil and Gas Sector" Middle East and North Africa Programme & Environment, Energy and Resources Department, *Chatham House*, (2015), 3

¹⁹³ Kuhn, *Enabling Iranian*.

¹⁹⁴ *Ibid*.

¹⁹⁵ Khajehpour, "The Future of the Petroleum," 8.

¹⁹⁶ Kuhn, *Enabling*, 144

¹⁹⁷ Khajehpour, "The future," 8.

¹⁹⁸ Stevens, Paul. "Prospects for Iran's Oil and Gas Sector", 4

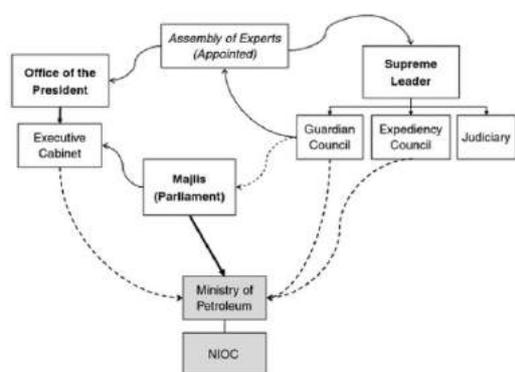
¹⁹⁹ Kuhn, *Enabling*, 204

Ministers, and is chaired by the President. Under the Ministry of Petroleum, state-owned companies (the three key state-owned enterprises: the National Iranian Oil Company (NIOC), the National Iranian Gas Company (NIGC), and the National Petrochemical Company (NPC)) dominate the activities in the oil and natural gas upstream and downstream sectors, along with Iran's petrochemical industry.²⁰⁰

The NIOC delegates some of its responsibilities to subsidiary bodies that execute the work on behalf of the NIOC. The NIGC also works through subsidiaries. NIGC is in charge of Iran's natural gas downstream activities, including gas processing plants, pipelines, and city natural gas networks. While NIGC processes, delivers, and distributes gas for domestic use, the National Iranian Gas Exports Company (NIGEC) is in charge of new pipeline and liquefied natural gas (LNG) projects.²⁰¹

Although the system of governance of the Iranian Energy sector seems centralised and pyramidal, in reality, it is vague (see Fig.11.). The control of the activities in the Iranian energy sector is spread among a variety of state-owned and NIOC affiliated companies, whose roles are sometimes unclear or overlap with other institutions. Additionally, the NIOC is influenced by legally institutionalised links with other institution and informal links and connections (see. Fig.11.)

Fig.11. Formal and informal links (dotted lines) that influence the NIOC



Source: Mahdavi, Paasha. "Oil, monarchy, revolution, and theocracy: a study on the National Iranian Oil Company (NIOC)"²⁰²

In summary, the government dominates the energy sector management. According to Khajehpour, this control assures the governments 'exclusive access to the proceeds of oil and gas exports as well as the sale of oil and gas to domestic buyers'.²⁰³ Not allowing privatisation of 'upstream oil and gas companies' 'means that the government 'is not ready to give up its monopoly on the upstream side'.²⁰⁴ Changing this internal policy would signal a domestic political shift to a new model of governance of the energy sector.

Western perceptions of Iran

The experience from the 1979 American diplomats hostage crisis, the 2011 attack on the British embassy in Iran, the ambiguous Iranian policy in the Middle East associated with terrorist organisations, the overall strained relations between Iran and the West after the 9/11 terrorist attacks and suspicions of illicit nuclear program conducted by Teheran are some of the main factors that have created a strong feeling of distrust in the West regarding Iran. This explicitly crystallised in President Bush's placing Iran in the so-called 'Axis of evil'. A key actor in the Middle East and traditional partner of the U.S.—Israel, stemming from its sense of insecurity in the region, also has strong objections against Iran's position in the region. Additionally, the radical rhetoric of the Iranian President Ahmadinejad during the peak of the Nuclear Dispute further strengthened Western alienation from Iran. In contrast, President Rouhani's political approach marked the beginning of a more moderate course and consequently led to a greater acceptance from the West.

In 2015, with the reconciliation between Iran and the international community, the first and

²⁰⁰ "Iran," EIA

²⁰¹ Ibid.

²⁰² Mahdavi, Paasha. "Oil, monarchy, revolution, and theocracy: a study on the National Iranian Oil Company (NIOC)" in *Oil and Governance. State-Owned Enterprises and the World Energy Supply*, edited by David G. Victor, David R. Hults and Mark C. Thurber Cambridge University Press 2011:234-279, 254.

²⁰³ Khajehpour, "The Future of the Petroleum," 8.

²⁰⁴ Ibid.

foremost precondition for Iran's re-integration into the international stage is present. Iran's domestic and regional behaviour and overall political identity is also of strategic importance for future deepening of the EU-Iran relations. In this regard, Alistair Burt, MP and former Parliamentary Under Secretary of State at the Foreign and Commonwealth Office (FCO) responsible for FCO policy, questioned whether Iran would emerge as a power, taking part in a structured world of rights and responsibilities or it would remain a regime exercising its influence being a counterpole to that structure.²⁰⁵

According to Burt, the identity question is a debatable issue within Iran. Its answer will be determinative for the political development, energy potential realisation and the improvement of economy in Iran. Given Iran's, sometimes controversial, position in the Middle East, its future role in the region and internationally, will be decisive for the relations between Iran and the international community. Iran's influence in the future of Iraq, Lebanon, Bahrain, Yemen, and other spots of instability in the region will be important. In a greater sense whether Iran leverage in the region will play a unifying or separating role between the region's actors and the Sunni and Shia communities divisions on matters, such as the fight against the Islamic State of Iraq and Syria (ISIS) and others, will be key for the security environment there.²⁰⁶

Iran's behaviour, however, will evolve within an interaction between Tehran and the rest of states. In this regard, as Burt points out, another question of future interest will be what the U.S., Saudi Arabia, Israel, and other states' expect from Iran and its re-emergence. In terms, of UK-Iran relations, after suffering many difficulties, they are now in a testing phase and have to undergo a gradual healing process, according to him.²⁰⁷ The re-opening of the British Embassy in Teheran shows that the reconciliation process is making progress.

Conclusion

The complicated political system in Iran might create an atmosphere of uncertainty for the IOCs. Especially, in evaluating the so-called political or state risk in terms of investment, a number of characteristics of the internal dynamics will play a role. The IRGC influence in the state and in the region has been seen as problematic.

According to Siamak Adibi, however, the main obstacle will not be the Iranian Revolutionary Guards interference in the state's energy sector, commonly identified as a key challenge. The most important obstacle for the IOCs to invest in Iran will be the fact that Iran is a bureaucratic country with several sources of power for rejection or approval of a project. In addition, negotiations will be a timely process. Iran's Petroleum ministry, NIOC, NIGEC and their subsidiaries, have small negotiation teams, which may not be able to handle all forthcoming negotiations at a short period of time when IOCs will rush to enter to Iran, according to Adibi.²⁰⁸

However, Iranian authorities' intention to attract IOCs back to the Iranian energy sector should also precondition a facilitation of the procedures and a more attractive investment environment for the IOCs. In this regard, the next chapter looks into the evolution of the petroleum fiscal regime in Iran and examines the potential changes that the Iranian authorities are planning.

Evolution of Iran's petroleum fiscal regime

Constitutional framework

The next section focuses mainly on the Constitutional Articles relevant to the Iranian energy sector and foreign investments procedures.

²⁰⁵ 1st EUCERS/ISD/KAS Energy Talks 2015, KCL

²⁰⁶ *Ibid.*

²⁰⁷ *Ibid.*

²⁰⁸ Adibi, interview.

According to the Constitution, Article 152, the principles of Iran's foreign policy are based 'upon the rejection of all forms of domination' in all aspects and 'nonalignment with respect to the hegemonic superpowers, and the maintenance of mutually peaceful relations with all non-belligerent States'.²⁰⁹ After setting the general context of Iran's foreign policy, Article 153 [No Foreign Control], further precises that '[a]ny form of agreement resulting in foreign control over the natural resources, economy, army, or culture of the country, as well as other aspects of the national life, is forbidden'.²¹⁰ Article 44.2 puts 'all large-scale and mother industries' under public ownership and administration by the State.²¹¹ Article 45 considers all mineral deposits a 'public wealth and property' that '/.../' shall be at the disposal of the Islamic government for it to utilise in accordance with the public interest'.²¹²

In this context, Article 43.8 and 9 stipulates that a principle of the Economy and Financial affairs of Iran is to prevent any 'foreign economic domination over the country's economy,' 'in order to satisfy public needs and to make the country self-sufficient and free from dependence'.²¹³ Finally, Article 81 forbids any granting of concessions to foreigners and prohibits foreign individuals to have the right to establish a company 'or institutions dealing with commerce, industry, agriculture, service, or mineral extraction'.²¹⁴ Article 82, further restricts employment of foreign experts.²¹⁵

To summarise, the constitution outlaws the private or foreign ownership of natural resources and points the NIOC as responsible institution for all upstream oil and gas projects. It represents Iran's post-revolutionary attempt to secure its sovereignty over its natural resources and to reduce the chance of foreign influence in the state. Any changes that may occur in Iran's contractual frameworks have to comply with the provisions of

the Constitution and the general guidelines it embeds.

Laws and regulations

IOCs usually assess the competitiveness of the opportunities offered by a certain state through the fiscal regime the state's government provides.²¹⁶ In particular, the licensing system of a petroleum fiscal regime is important for the IOCs, because it regulates the way the government and the IOC interact. Resource ownership clause divides the licensing systems into concessions and contractual-based systems. In concessions, the contractor owns the resources located in the concession area. The government benefits from royalties and taxes. The contractual systems do not envisage any ownership right of the oil in the ground. The contracts could be subdivided into service contracts and production sharing agreements (PSAs). PSAs allow foreign ownership, or "titling" of the oil once it is extracted, while service contracts do not allow any.

Risk sharing between the investing company and the host government is another determinative characteristic, which divides the upstream service contracts into pure service contracts, also called non-risk service contracts, and risk service contracts. In pure service contracts, the state is the party that bares the risk. Additionally, the state is usually the one that invests in the project and through pure service contracts it seeks technological and expertise assistance from IOCs. In risk service contracts the IOC is usually the investor and it either bares the risk alone or with the National Oil Company (NOC). The IOCs are paid for their services by a fixed fee, which is generated from the revenues of the sold oil. Service contracts in different states could differ in their terms. For example, Iran uses risk service contracts called "buy-back contracts", whereas other states, such as Iraq, use technical service contracts.

²⁰⁹ Constitution of IRI, Article 152

²¹⁰ Ibid. Article 153

²¹¹ Ibid. Article 44.2

²¹² Ibid. Article 45

²¹³ Ibid. Article 43.8 and 9

²¹⁴ Ibid. Article 81

²¹⁵ Constitution of IRI, Article 82

²¹⁶ Feng, Zhuo, Shui-Bo Zhang, and Ying Gao. "On Oil Investment and Production: A Comparison of Production Sharing Contracts and Buyback Contracts." *Energy Economics* 42 (2014): 395-402.

The petroleum fiscal regime in the post-revolutionary Iran prohibits foreign ownership of natural resources through explicit restrictions in the Constitution and does not allow foreign investments, as stipulated in the Petroleum Act of 1987. Article 6 of the Petroleum Act allows capital investments only through government institutions and included in the General State Budget. Foreign investments 'in any manner' are not 'allowed whatsoever'.²¹⁷ Article 12 guarantees that any law that collides with the Petroleum Act should be 'abrogated and stand null and void'.²¹⁸ The Petroleum Act is considered to reflect the post Iran-Iraq war atmosphere in Iran,²¹⁹ which strongly encouraged Iran's fully independent development of its oil and gas sector.

After the Islamic Revolution, followed by the devastating social and economic consequences of the Iran-Iraq war, almost all of the activities in the Iranian energy sector ended. The contracts involving IOCs investments were cancelled and the gas exports were redirected mostly to satisfying the domestic needs of the exhausted by the war state.²²⁰ The vital need of foreign investments into the energy sector preconditioned a looser interpretation of the Iranian law by its authorities. Consequently, it was accepted that 'only direct foreign investments that are combined with the ownership of reserves' are forbidden.²²¹

This new more pragmatic perception allowed forms of contracts on a service base, without any ownership clauses, to be concluded between Iran and IOCs. In the Budget Act of 1994, the so-called buy-back contracts (BBCs) – a type of risk service contracts that allow foreign participation in the Iranian energy sector – were officially introduced. In the Second, Third and Fourth Five-Year Economic, Social and Cultural Development Plans, the buy-back concept was further restated

and expanded.²²² In the Budget Act of 2003, the NIOC was authorised to strike buyback contracts for both exploration and development phases.²²³

The development of the BBCs progressed in liaison with Teheran's gradual attempt to improve the foreign investments environment in Iran. In this context, during the late 1990s, several key legal acts were issued. Some of them are: the 1997 Iranian Law on International Commercial Arbitration, based on the United Nations Commission on International Trade Law (UNCITRAL); Permitting Registration of Branches and Representative Offices of Foreign Companies Law; an amendment, allowing the creation of 100% foreign-owned banks and insurance companies in the Free Trade Zones (FTZ) and others.²²⁴ In the beginning of the 2000s, Iran became member of the World Intellectual Property Organisation, the Madrid Agreement, and the Madrid Protocol for the International Registration of Marks, the Lisbon Agreement for the Protection of Appellations of Origin and their International Registration, which agreements ensure the protection of geographical names associated with products and others.

Protection and Encouragement of Foreign Investment Act (FIPPA) from 2002, first of its kind after the revolution, provided greater security for FDI in Iran. Additionally, it allowed foreign investment in all sectors in forms of Civil Participation, build-operate-transfer schemes (BOT) and buy-back forms of foreign participation.²²⁵ FIPPA also established a Centre for Foreign Investment Services at the Organization for Investment, Economic and Technical Assistance of Iran (OIETAI) 'for focused and efficient support for foreign investment undertakings in Iran'.²²⁶

The dispute resolution in FIPPA envisages the domestic courts as dispute resolution authority

²¹⁷ Petroleum Act 1987, Article 6

²¹⁸ Ibid. Article 12

²¹⁹ Shahri, Nima Nasrollahi. "The Petroleum Legal Framework of Iran: History, Trends and the Way Forward." *China and Eurasia Forum Quarterly* 8, No. 1, 126.

²²⁰ Hassanzadeh, *Iran's natural gas*, 17

²²¹ Kuhn, Maximilian and Jannatifar, Mohammad "Foreign direct investment mechanisms and review of Iran's buy-back contracts: how far has Iran gone and how far may it go?" *Journal of World Energy and Business Volume 5 Issue 3* (2012): 207-234

²²² Shiravi, Abdolhossein, and Seyed Nasrollah Ebrahimi. "Exploration and Development of Iran's Oilfields through Buyback." *Natural Resources Forum* 30, No. 3 (2006): 199-206, 201.

²²³ *ibid.*

²²⁴ Kuhn and Jannatifar, "Iran's buy-back contract," 209

²²⁵ Foreign Investment Promotion and Protection Act (FIPPA) 2002, Article 3

²²⁶ FIPPA, Foreword

(Article 19).²²⁷ From IOCs' perspective, this method is usually considered as unsatisfactory, because it vests the legal authority in the host state's institution and not an international one. Nevertheless, if there are Bilateral International Treaties/Agreements (BITs) between Iran and the state of origin of the concerned company, the provided method of dispute resolution in the BIT is applicable. In BITs this is usually arbitration at ICSID (The International Centre for Settlement of Investment Disputes) or under UNICITRAL. In BITs the foreign party is offered fair and equitable treatment by discarding all discriminatory measures or arbitrary, guaranteeing national and most-favoured nation treatment to foreign investments. Iran has concluded BITs with more than 60 states. There are not any with the UK.

Another step, taken in the 1990s, to attract foreign investment, create jobs, improve and modernise the technical capacity and develop certain regions was the creation of Free Trade-Industrial Zones (FTZ), followed by the establishment of Special Economic Zones (SEZ). Iran's FTZ include: Kish, Qeshm, Chabahar, Aras, Anzali, Makou, Arvand.²²⁸ The SEZ are: Amir Abad, Yazd, Lorestan, Khalij Fars, Shahid Rajaei, Pars, Shiraz, Petroshimi, Khalij, Fars, Booshehr, Sarakhs, Bandar Booshehr, Sirjan, Salafchegan, Payam, Arge, Jadid.²²⁹

While the FTZs have various aims, the SEZs attempt to facilitate goods transit and improvement of supply and distribution networks in the country.²³⁰ The idea behind the SEZs is that they provide better conditions for foreign investors and easier operations within a certain zone. For example, the Pars Special Economic Energy Zone (PSEEZ) was established 'for the utilization of South Pars oil and gas resources and encouraging commercial activities in the field of

oil, gas and petrochemical industries'.²³¹ The objectives of PSEEZ include, '[f]acilitating the on-time execution of various oil and gas projects, providing the appropriate foundation to attract local and foreign partnership with the aim of developing oil, gas and petrochemical industries' and other measures that aim better economic conditions in the region and faster development.²³²

Changes in the fiscal regime that began in the 1990s significantly improved Iran's post-revolutionary investment climate. However, as pointed out at the beginning of this section, the licensing system is the one of determinative importance for the IOCs' choice. The next section examines the Iranian buy-back contracts and their competitiveness.

Buy-Back Contracts (BBCs)

The BBCs are type of risk service contracts. One of the main characteristics of the BBCs is that they do not transfer any resource ownership to the contracted IOCs. The NIOC or other relevant governmental company only 'subcontract' some of its responsibilities to the foreign company, resulting into a 'division of duties' between the NIOC and the contracted IOC.²³³ The IOC finances and manages the exploration and production phase (E&P) until the production phase starts. Then the IOC transfers the control, technology and the know-how to the NIOC. The initial foreign investment is converted into a loan (annuity). The IOC in this sense is working on behalf of the NIOC. The IOC is paid back the investment costs and is being paid for the provided services by allocation of a portion of the production based on an agreed-upon targeted rate of return (ROR).²³⁴

²²⁷ Ibid. Article 19

²²⁸ "Free Economic Zones" Center for Free and Special Economic Zones, <http://www.freezones.ir/Default.aspx?tabid=137>, Accessed: June 15, 2015

²²⁹ Ibid.

²³⁰ Hakimian, Hassan. "Iran's Free Trade and Special Economic Zones: Challenges and Opportunities." Conference on Iranian Economy at a Crossroads: Domestic and Global Challenges, 2009.

²³¹ "Pars Special Economic Energy Zone", Center for FSEZ

²³² Ibid.

²³³ For detail see Kuhn & Jannatifar, "Iran's buy-back," 213

²³⁴ The analysis of the BBCs has been acquired from various sources. For detailed analysis see Kuhn & Jannatifar, "Iran's buy-back"; Brexendorff, Alexander., Ule, Christian and Kuhn, Maximilian. "The Iranian Buy-Back Approach." Oil, Gas and Energy Law (OGEL) 1 (2009) Shiravi, & Ebrahimi, "Exploration and development through buy-back"; Shahri, "The petroleum legal framework of Iran";

There are four types of IOC costs in a BBC:

- Capital costs (CAPEX)-all costs directly related to development operations
- Non-capital costs (Non-CAPEX)-costs that cannot be defined at the time of signing the contract. These are mainly costs paid to the Iranian authorities in a form of taxes, custom duties and others
- Operating costs (OPEX)-costs directly relevant to the production. Although the NIOC is responsible for the production, if divided into phases, IOC can be considered responsible for the beginning of the production phases
- Bank charges-costs for financing, calculated according to the LIBOR (London Interbank Offered Rate), plus a defined percentage (0.50-0.75).²³⁵

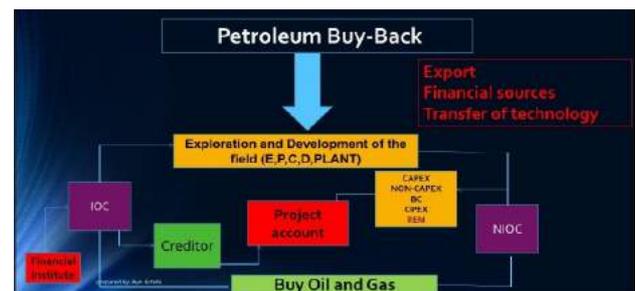
The IOC and the NIOC agree upon Master Development Plan (MDP). The IOC specifies the defined scope of work, certain level of production that has to be reached, the cost of the project, within a cap and a fixed remuneration fee (RF), recovered by the IOC within a specified period of time, as well as other terms and conditions. Generally, the IOC should be fully remunerated, within an agreed cost recovery period, in case of successful completion of the MDP, namely completing the development activities, transferring the technology and control to the NIOC, reaching the agreed production level and others. Additionally, the costs categorisation is verified, usually by the NIOC to ensure that the costs are correctly listed.²³⁶

What is specific for the BBCs is that the IOC is paid back by being entitled 'a fixed portion of oil (50%-60%) of the new or additional production generated by the project under long-term export oil sale agreements, which continues until all IOC's costs and remuneration are paid'.²³⁷ The CAPEX is reimbursed up to a ceiling fixed in the BBC and any cost made by the IOC to fulfill the

MDP exceeding that limit is solely borne by the IOC. All non-CAPEX and OPEX costs are paid back, without having a certain ceiling. The bank charges, usually applied to CAPEX and non-CAPEX costs, are also reimbursed.²³⁸

The IOCs' expenses are returned, with 'an agreed-upon level of profit generated by the product,' with an added RF.²³⁹ The RF is based on a ROR (for 2012 it 'has reflected nominal rates of return to the contractors in the range of 13-21%') and it is paid to the IOC as a reward for the risk that it has taken and for the initial investment.²⁴⁰ Depending on the terms of the contract the RF may differ, but the 'gross RF is usually in the region of 30-70% of the CAPEX of the project,' according to Kuhn and Jannatifar.²⁴¹ The payback period initially longer, was reduced to around 4 years.²⁴²

Fig.12. Buy-Back Contracts



Source: Aye Katebi, 2014, Petroleum University of Technology, Oil and Gas Contracts in Iran, Presentation May 2014

Buy-Back Contracts' risks

From the IOCs' perspective, BBCs hide risks of potential losses. The amount of profit that IOCs are able to receive as cost recovery and RF can be limited due to the rigid conditions of the MDP and lack of flexibility of the system in general. The most risks involving factors for the IOCs are associated with: the development costs overrun, completion date delays, reserves and production rates deviations, oil price fluctuations, LIBOR reduction and non realisation of the RF.²⁴³

Ghandi, Abbas, and C. - Y. Cynthia Lin. "Oil and Gas Service Contracts around the World : A Review."

²³⁵ Shiravi & Ebrahimi, "Exploration and development of Iran's oil fields", 202

²³⁶ Kuhn & Jannatifar, "Iran's buy-back";

Shiravi, & Ebrahimi, "Exploration and development"

²³⁷ Kuhn & Jannatifar, "Iran's buy-back," 217

²³⁸ Shiravi & Ebrahimi, "Exploration and development," 202

²³⁹ Kuhn & Jannatifar, "Iran's buy-back," 213

²⁴⁰ Ibid. 217

²⁴¹ Ibid.

²⁴² Hassanzadeh, *Iran's natural gas*, 91

²⁴³ Ghandi and Lin, "Oil and Gas service", 3

Additionally, the fixed RF, no resource ownership, not allowed participation in the production phase, no benefits from higher oil prices and unsatisfactory dispute resolution clause are some of the key terms, regarded as not being investment friendly.²⁴⁴ All these factors can directly affect IOCs profits.²⁴⁵ They are separately examined below.

- **Fixed cap on CAPEX risks** is related to the fixed capital cost and the lack of available means of compensation for the IOC in case of overrun. The pre-negotiated CAPEX ceiling could be exceeded due to unpredictable circumstances and the costs above the fixed cap are borne solely by the IOC.²⁴⁶ The CAPEX related uncertainties, such as price changes and unexpected costs, are one of the most risk generating factors.
- **Not fulfilled pre-negotiated terms and subsequent delays** are risk-hiding situations for the IOC because it is paid only after production reaches a certain level. Under the BBCs the IOC is remunerated in case of successful conclusion of the contracted operations. The IOC may lose its RF, if for any reason; it is unable to successfully fulfil the conditions stipulated in the MDP.²⁴⁷ Additionally, in case of IOC's delay in completion of the construction, the company is responsible for the bank charges for the extended period.²⁴⁸ A delay in realisation of the contractual production levels, affects the maximum payable amount to the IOC. The company fears that its contract will end before it has completed the recovery of its costs, since the amortisation cannot continue after the end date of the contract.²⁴⁹

Farnejad, "How competitive is the Iranian buy-back contracts in comparison to contractual production sharing fiscal system?" University of Dundee, The Centre for Energy, Petroleum and Mineral Law and Policy Gateway homepage: CAR (CEPMLP Annual Review) : CAR Volume 10, 11

²⁴⁴ Shivari, & Ebrahimi, "Exploration and development", .205-206

²⁴⁵ Groenendaal and Mazraarti quoted in Ghandi and Lin "Oil and Gas service", 23

²⁴⁶ Shiravi & Ebrahimi, "Exploration and development"

²⁴⁷ Ghandi and Lin, "Oil and gas service," 17

²⁴⁸ Groenendaal and Mazraati cited in Ghandi and Lin, "Oil and gas service", .14-16

²⁴⁹ Hassanzadeh, *Iran's natural gas*, 91

- **The fixed RF** is the only actual profit that the IOC gets. The IOC does not have incentive to undertake great risks for a fixed fee.²⁵⁰ IOCs would expect to have their profits calculated by taking in consideration the involved risk and other important factors, including the possibility of potential increase of profits.
- **Ownership of production** is another factor that is very important for IOCs. No ownership is allowed under the BBCs. IOCs would like to have the opportunity to book the allocated to them reserves for financial reporting purposes.
- **IOC participation in production** is not possible under BBCs. IOCs transfer the field to the NIOC at the beginning of the production phase. Although a decrease of the production affects the IOC, it is not allowed to participate in this phase. IOCs would prefer to directly participate in production operations.
- **Benefit from higher oil prices** is not possible under the BBCs. IOCs receive a fixed amount of remuneration. The NIOC is the only party that benefits from oil and gas prices increase. IOCs would expect to benefit from higher prices as well.
- **Dispute Settlement** under BBCs' requires a third party decision for important matters. IOCs would prefer a settlement procedure that satisfies their concerns.²⁵¹
- **Decision-making difficulties** occur because of the slow decision making process. Therefore, IOCs would prefer a more facilitated way of managing the decisions for the projects.
- **Short period (5-7 years)** makes the IOCs reluctant to engage and increase their investments in the project. IOCs and Iran would both benefit from a longer duration of the contracts.

Third generation of Buy-Back Contracts

²⁵⁰ Shiravi & Ebrahimi, "Exploration and development", 205- 206

²⁵¹ Ibid.

The lack of substantial foreign investments led to some changes in the BBCs. According to Shiravi, the NIOC made suggestions to improve the BBCs' terms by applying some changes:

- CAPEX to be calculated after the subcontractors are awarded via tendering
 - An escalation clause regarding inflation and changes in market prices of materials, equipment and manpower to be introduced
 - A percentage of the production to be allocated to the IOCs according to a sliding scale, if the production reaches a level agreed in the contract
 - Reserve booking to be allowed.²⁵²

Some of the aforementioned suggestions occurred in the so-called third generation of buy-back contracts. According to Kuhn and Jannatifar, the third form of the contracts improved the terms for agreeing upon CAPEX and its ceiling, as well as ROR rates with less risk involved were introduced. Additionally, the third generations of BBCs assured longer IOC involvement in the project and incentives for delivering the project on time and keeping the cost low. In the Chinese company Sinopec and NIOC enhanced BBC deal of 2008 for the development of the Yadavaran oil field, CAPEXs are allowed to be capped at a later stage, after construction tender submissions have been received, thus reducing the parties' 'exposure to value erosion through cost inflation'.²⁵³

Under the third generation of BBCs, also called "open tender" or "open capex" contracts, the cap of investment expenditures is determined on a later phase (18 to 24 months after conclusion of the BBC) at a public tender.²⁵⁴ The ceiling on the CAPEX is determined after Front End Engineering Design (FEED).²⁵⁵ The parties then can gather more information about the details and uncertainties of the project, so they are able to take into consideration some risks. Additionally,

the ROR is determined according to the status of each project and the techniques applied for its development.²⁵⁶ The payback period is shortened to around 4 years, the rate of return is raised to 14.98% and the third generation envisages extension of the contract for full recovery to as long as 12-15 years.²⁵⁷ Shahri also mentions that in the MDP there is a place of premature production used for cost recovery of initial production process and also contractors' responsibility to transfer new technology and training experts from the Petroleum Ministry.²⁵⁸

In spite of being more flexible, especially in terms of probable cost escalations,²⁵⁹ other shortcomings of the BBCs remained unchanged. According to R. Yeganehshakib, the contracts lack clarity about the production phase participation, have ambiguities in the way costs are calculated in the FEED (Front End Engineering Design) phase and about tender execution.²⁶⁰ Due to the international sanctions third generation of the BBCs have not been largely implemented.

The BBCs led to renewed foreign involvement in the upstream sector. Iran made several amendments in the BBCs' terms to attract more foreign investment but the attempts did not bring the expected result. In fact, the IOCs perceived them as a method of early engagement into the Iranian energy sector, while expecting that the Iranian authorities will offer risk-sharing agreements. The main reason for IOCs' reluctance to invest in Iran is related to the difficult domestic and international political situation and the subsequent sanctions on Iran banning foreign investments in the state. Apart from the international political insecurity, another factor could be that the terms of the buy-back contracts were not considered to be competitive enough in comparison with terms offered by other oil producing countries.

²⁵² Ibid.

²⁵³ Kuhn & Jannatifar, "Iran's buy-back," 223

²⁵⁴ Akhlaghi, Dr Behrooz & Associates, "Bi-weekly news & analysis of the international law office," International Law Office, April 7, 2014, p.5

²⁵⁵ Yeganehshakib, Reza, "Iran's New Generation of Oil and Gas Contracts: Historical Mistrust and the Need for Foreign Investment," *The Journal of Political Risk*, Vol. 3, No. 4, (2015)

²⁵⁶ Shahri "The Petroleum Legal Framework of Iran: History, Trends and the Way Forward," 5

²⁵⁷ Elham, *Iran' Natural gas*, 91

²⁵⁸ Shahri, "The Petroleum Legal Framework of Iran", 5

²⁵⁹ Kuhn & Jannatifar, "Iran's buy-back," 223

²⁶⁰ Yeganehshakib, "Iran's new generation"

Buy-Back Contracts vs. Iraq's Technical Service Contracts (TSC)

Ghandi and Lin, point eight states that have types of service contracts: Iran (BBCs); Iraq (Technical Service Contracts-TSC); Venezuela (Operational Service Agreements OSA, later converted into "mixed enterprise" frameworks with majority stakes for PDVSA-Petróleos de Venezuela, S.A.); Kuwait (Oil Field Service); Mexico (Integrated Exploration and Production Service Contracts); Bolivia (Upgraded Exploration Operations service); Ecuador (Integrated Specific Service Contracts).²⁶¹ All of these service contracts differ in their terms. To assess Iran's BBCs competitiveness in relation to Iraq's contracts some of the main terms of the BBCs and TSC are compared in the table below (see Table 7).

Under TSCs a Joint Management Committee, comprising Iraq and IOC's representatives, is created. The Committee is usually responsible for the Working Programme, budget, production schedule and the rest of the joint IOC and NOC actions,²⁶² unless it does not specifically deal with technical operations only. As analysed in the previous sections the BBCs terms do not envisage risk sharing between the IOC and the NIOC and there is not a joint committee that oversees the operations. In the TSC any overrun of CAPEX is paid-back, whereas in the BBC it is borne by the IOC. TSCs are usually longer (20-25years) in duration than the BBCs (5-7 years). Additionally, in the BBCs the remuneration is fixed, whereas Iraqi TSCs offer remuneration per barrel production, in which the IOC's remuneration is transferred into barrels of oil which are delivered at an Iraqi export point.²⁶³

Interesting is that the fees per barrel in Iraq are very low. TSCs are usually offered on bidding competition, where the IOC offering the lowest RFB (remuneration per barrel fee) is usually chosen. RFB varies 'from \$1.15 per barrel to as high as \$7.50 per barrel' and are further reduced

by other costs and taxes, so the government takes as high as 99% in some cases.²⁶⁴ For instance, in the case of West Qurna 1 field TSC of 2009, it is estimated that ExxonMobil and Shell had \$25 billion Capital expenditure, \$25 billion Operating costs over a TSC duration period of 20 years and \$1.9 RFB.²⁶⁵

Although it seems that the government benefits a lot more than the IOC, the Internal Rate of Return (IRR), which is determinative for the IOC gains of those projects, is high.²⁶⁶ IRR in some projects in Iraq vary between 10% and 20%, according to Deutsche Bank.²⁶⁷ Additionally, since the oil fields in Iraq have large production potential, the IOC's costs are expected to be recovered very quickly.²⁶⁸ For example, the average daily production of Rumaila oil field for 2014 was 1.34 MMbbl/d, according to BP. In the TSC for Rumaila, the Iraqi government receives about 98% of the revenue.²⁶⁹ BP is remunerated on a fee of \$2 per barrel in profits, which should account to 15 to 20% rate of return on investment.²⁷⁰ This example shows how high the IRR could compensate for the low RFB.

In this regard, it can be concluded that TSCs are satisfactory to the IOCs, especially in cases when they apply to big oil fields, with large production and low risk and expenditures.²⁷¹ It could be assumed that TSCs terms in combination with the specific characteristics of the Iraqi oil fields might have made them more attractive to the IOCs than the BBCs. However, a greater analysis encompassing all of the important factors influencing IOCs' choices of investments has to be conducted in order to accurately compare the investment conditions in Iran and Iraq.

²⁶¹ Abbas Ghandi, C.-Y. Cynthia Lin, "Oil and Gas Service", 11

²⁶² Ibid.68

²⁶³ "One Day - One Word." 2B1st Consulting. August 10, 2012. Accessed September 10, 2015. <http://www.2b1stconsulting.com/technical-service-contracts/>.

²⁶⁴ "Open Oil, Oil Contracts", 96

²⁶⁵ "One Day- One world", 2B1stconsulting

²⁶⁶ Ibid.,115

²⁶⁷ Ibid.

²⁶⁸ Ibid.

²⁶⁹ "BP in Iraq", British Petroleum (BP), Accessed: 05, August 2015

<http://www.bp.com/en/global/corporate/about-bp/bp-worldwide/bp-in-iraq.htmlRumaila>

²⁷⁰ DiPaola, Anthony and Gismatullin, Eduard. "BP says return on Iraq's Rumaila to compare with world fields" Bloomberg, July 28, 2009.

Table 7. Comparison between some basic characteristics of the Iranian BBC and Iraqi TSC

Criteria	Iran BBC	Iraq TSC
Oil Field Operator	NIOC subcontracts IOCs	Joint Management Committee
Oil production ownership	Iran	Iraq
Remuneration	Fixed IOC ROR	Based on per barrel production
Risk	IOC	Shared between IOC and NOC
Duration	5-7 years	20 years
Benefits from high oil prices	No	No
CAPEX Costs overrun	Not recovered	Recovered

Source: Author's own table, information about Iraqi TSC based on Abbas Ghandi, C.-Y. Cynthia Lin (2014), *Oil and Gas Service Contracts around the World: A Review*, and Ghandi and Lin, *An Analysis of the Economic Efficiency of Iraq's Oil Service Contracts*. Information about BBCs is based on own analysis.

Buy-Back Contracts vs. Kurdish Regional Government production sharing contracts

In Iraqi Kurdistan region, the Regional Kurdish Government offered Production sharing contracts to investors. The PSAs are considered to be attractive to the IOCs, because they allow the produced oil to be shared between the government and the IOC—a factor that further enhances competition in the region.

According to the Kurdish Regional Government (KGR) sample Production Sharing Contract (PSC), 'the government grants the contractor the exclusive right and authority to conduct all Petroleum Operations in the Contract Area'.²⁷² The contractor acts as operator and is responsible for the conduct of all petroleum operations, at its sole cost and on its own risk.²⁷³ In PSCs, during the exploration period, the assets acquired by the contractor belong to the contractor. In the development phase, they are transferred to the government.²⁷⁴

The exploration phase is from 5 to 7 years and during that period the contractor is obligated to pay Exploration Rental to the government.²⁷⁵ If there is a commercial discovery, the contractor has the 'exclusive right' to develop and produce it

for a period between 20 to 25 years.²⁷⁶ The contractor has to sell to the government any amounts of Crude Oil, necessary to meet Kurdistan Region internal consumption requirements.²⁷⁷ If there is not any commercial finding, the contract is terminated. Royalties are paid to the government.²⁷⁸

The contractor recovers its Petroleum Costs in the event of a Commercial Discovery.²⁷⁹ The costs are recovered from the so-called "Available oil"—the produced oil from the field 'after deduction of any quantities of Export Crude Oil due for Royalty pursuant,²⁸⁰ valued at the International Market Price obtained at the Delivery Point.²⁸¹ If the Available Petroleum is insufficient to recover the contractor's Petroleum Costs, the amount of unrecovered Petroleum Costs are 'carried forward indefinitely to the subsequent Calendar Years until all Petroleum Costs are fully recovered'.²⁸² The profits have to be shared between the government and the contractor.²⁸³ Additionally, the contractor is 'entitled to receive, take in kind and to export freely its share of Profit

²⁷² Kurdish Regional Government (KGR) Production Sharing Contract (PSC), Article 2.1

²⁷³ Ibid. Article 2.3

²⁷⁴ Ibid. Article 20

²⁷⁵ See *ibid.* Article 6

²⁷⁶ *Ibid.* Article 6.10-6.12

²⁷⁷ *Ibid.* Article 16.15

²⁷⁸ *Ibid.* Article 24

²⁷⁹ See *ibid.* Article 2.6

²⁸⁰ *Ibid.* Article 25

²⁸¹ *Ibid.* Article 25.2.

²⁸² *Ibid.* Article 25.6.

²⁸³ *Ibid.* Article 2.7.

Petroleum'.²⁸⁴ The contractor is exempted from taxes, except corporate income tax.²⁸⁵

To summarise the important points of the KGR PSCs – the IOC becomes a contractor to the KGR, acts as operator and conducts all the operations on its own risk and costs by having control over the oil during the petroleum operations. It recovers all of its petroleum costs through the produced oil and it receives a profit share from that oil, but it also has to pay royalties to the government.

Compared to the Iranian buy-back, the KGR PSCs offer longer period and more cost recovery guarantees, which in total make them less risky to the investor. The significant difference between the BBCs and PSCs is that in the PSCs IOCs are granted the right to conduct the full cycle of oil operations, including production and export of its share of oil. Therefore, the PSCs are considered more attractive to the IOCs than most of the service contracts.

Finally, it should be pointed out that another analysis is required to assess the risks PSAs may hide for the host government. For example, as Ismaila Jalo points out, 'having incurred exploration and development costs, the contractor may be prone to engage in 'gold-plating' in order to escalate recoverable costs'.²⁸⁶ If the host state does not accurately supervise the IOC's drafting of the E&P programme, it may end paying more costs to the IOC. This may happen when in the initial programme the IOC envisages a greater share for possible inflation of capital expenditure than realistically expected.²⁸⁷

Iranian (Integrated) Petroleum Contracts (IPCs)

During the Iranian Nuclear Negotiations, the NIOC saw an opportunity to attract foreign companies' attention towards its vast energy potential. In the beginning of the 2014, the NIOC announced that it is preparing new petroleum

contracts, the so-called Integrated or Iranian Petroleum Contracts (IPC), with better and flexible conditions than the ones in the BBCs. The official introduction of the IPCs, originally planned to take place in London, was postponed several times, reportedly in consideration to sanction restrictions.²⁸⁸ Since a permanent agreement has been reached and it is expected sanctions to be lifted, officially introducing the IPCs will be the second turning point for the development of the Iranian oil and gas industry.

As of August 2015, the exact terms of the IPCs cannot be confirmed due to the cancelling of the IPCs official announcement. Based on the available information, the next section attempts to draft the most probable terms of the IPCs. According to A. Creed and A. Kordvani, some of the main objectives of the IPCs are to help 'the Iranians achieve enhanced technology, establishing long term relationships with foreign partners, and reducing the investment risks by offering more flexibility in investment costs'.²⁸⁹

Integrated Petroleum Contracts potential terms

According to Aye Katebi's, adviser to the revising committee of oil ministry contracts,²⁹⁰ presentation, the new Iranian oil contracts will offer the following improvements: flexible development plan, annual work programme instead of fixed capital cost, full cost recovery, balance risk-reward approach, flexible reward considering the oil price change, flexible fee for different areas with different risk involved, cost saving index, reforming the decision making process, flexibility for long term cooperation, flexibility for longer term engagement in case of EOR, and flexible partnership.²⁹¹ Other changes

²⁸⁸ "Lawmakers Seek Sanctions Probe of Iranian Oil Meeting." *The Wall Street Journal*, 2015.

²⁸⁹ Creed, Adrian, and Dr Amir Kordvani. "Iran's New Integrated Petroleum Contracts." *Clyde&Co*, May 11, 2014. Accessed September 10, 2015. <http://www.clydeco.com/insight/updates/view/irans-new-integrated-petroleum-contracts-1>.

²⁹⁰ "Scientific Committee." *Oil Industry Contracts Revision*. Accessed September 10, 2015.

<http://oicr.ir/en/Content/732/Scientific-Committee>.

²⁹¹ "Oil and Gas Contracts in Iran." *Petroleum University of Technology*, May 12, 2014. Accessed September 10, 2015.

http://www.put.ac.ir/_Tehran/documents/p_4-2.pdf.

²⁸⁴ *Ibid.* Article 26.9

²⁸⁵ *Ibid.* Article 31

²⁸⁶ Jalo, Ismaila. "The rights to explore petroleum. What manner of rights is best suited for the Iraqi petroleum industry?", *University of Dundee, CEPMLP Annual Review - CAR Volume 16 (2013)*

²⁸⁷ *Ibid.*

that have been discussed are: integration of the exploration, development and production phase, booking of reserves, participation in other exploration projects in the event of no commercial finding of the initial one, disputes under exclusive jurisdiction of the Iranian courts and better transfer of know-how and technology.²⁹² Katebi's presentation specifies that the outlined flexibilities could be applied for the following areas:

1. Exploration
2. Integrated Exploration and development operations for new areas
3. Enhanced Oil Recovery of the Brown fields (IOR&EOR)
4. Development of the Common fields with the neighbouring countries
5. E&D&P operations in the "High Risk" areas and Deep water
6. Integrated E&D&P&IOR/EOR
7. Development of Green Fields²⁹³

IPCs potential terms and characteristics are discussed in detail below:

Booking of reserves

The reserves booking clause has been the most sensitive part of the oil contracts for both Iran and the international investors. IOCs are interested in booking reserves to their balance sheets, because they can include the potential profits as cash from the produced and sold oil, through for example, a DCF (discounted cash flow) model against the future expected price.²⁹⁴ The Iranian Constitution, however, does not allow any ownership of natural resources.

As of May 2015, there is not clear information if IPCs will mark a significant change in allowing reserves booking, because the matter is being

negotiated in Iran. Although the ownership of natural resources will remain under the Iranian exclusive authority, similar to the PSA, the IPC terms may allow 'transfer of ownership of hydrocarbons to the foreign partner at defined delivery points'.²⁹⁵ The ownership of above ground hydrocarbons excludes 'any ownership rights over the project assets'.²⁹⁶ According to Seyyed Mehdi Hosseini, head of the committee that revises oil investment contract models, 'the new type of contracts allow international investors to include their revenue from Iranian hydrocarbon resources in their annual financial and monetary reports—their bottom line'.²⁹⁷

Experts are sceptical about any changes in regard to booking of reserves and believe that the investors will remain able to gain revenues only after the oil or gas is produced and sold.²⁹⁸ According to Cook and Barden, if there is no booking of reserves, the operations will become more expensive, as the IOCs will not have the option to rise their income by including the booked reserves in their balance sheets.²⁹⁹ This will make the Iranian contracts remain less attractive than the PSAs. Booking of reserves and assets ownership has been a problematic topic for the IOCs. Iran probably will try to address this issue in a manner that will satisfy the IOCs and at the same time will not be against the Iranian constitution.

Integration of exploration, development and production phase

The IPCs are expected to have the IOCs engaged with the full energy cycle, including the production phase. This is the reason the new contracts are also called "integrated" Petroleum Contracts. Allowing the companies to participate in the production phase will mark a major change, not seen in Iran since the Revolution of 1979.

Flexible partnership and risk sharing

²⁹² Information for the terms of the IPC has been acquired through various sources, for information see: Adrian Creed and Dr Amir Kordvani, "Iran's new contracts"

Aye Katebi, Petroleum University of Technology, Oil and Gas Contracts in Iran, Presentation May 2014, http://www.put.ac.ir/_Tehran/documents/p_4-2.pdf
Vakhshouri, Sara "Iran offers new terms of oil contracts", *AI Monitor*, Feb.26, 2014

²⁹³ Aye Katebi, Presentation, slide 31 and 32

²⁹⁴ Cook, Chris, and Sam Barden. "Iran Petroleum Contract and the Missing Link - Pre-pay." *Teheran Times*, March 3, 2014.

²⁹⁵ Creed and Kordvani, "Iran's new integrated"

²⁹⁶ Ibid.

²⁹⁷ Vakhshouri, "Iran offers new terms for oil contracts"

²⁹⁸ Shahri, "The Petroleum Legal Framework of Iran,"

8

²⁹⁹ Cook and Barden, "Iran Petroleum Contract"

The IPCs are expected to introduce an approach that encourages the NIOC to set up joint ventures (JV) between the IOC and the domestic company, NIOC or other affiliate of the NIOC. The Corporate Registration Bureau of Iran is usually the institution that lists the JV. The Joint ventures are anticipated to facilitate technology and know-how transfer to the Iranian party and to enhance cooperation between the IOC and the domestic companies. As the global energy market is dynamic, 'having international partners as joint producers and market conduits for its oil would be of immense help to Iran'.³⁰⁰ In the BBCs the NIOC acted as a "contractor", while in the IPC it might act as a "technical partner", according to Shahri.³⁰¹ The creation of a form of Joint Committee enables more risk sharing between the NIOC and the IOC. If included in the IPC terms, this will also be of crucial importance for the IOCs to decrease the risk factors.

Reformed decision making process

This change is in line with the previous point regarding the joint way of risk-sharing and management of the project. IPCs intention is to reduce the Iranian authorities' involvement in the decision-making, which has been seen by the IOCs as problematic and slowing down the process. Therefore, a less complicated procedure for the NIOC-IOC cooperation will be envisaged.

Flexible Development Plan

The fixed development plan of the BBCs cannot accurately reflect the unexpected developments of the projects. Therefore, a more flexible way of planning is expected to be introduced. Reviewing of the plan on different stages of the project could be suggested as well.

Annual work programme budget

The ceiling of the CAPEX is probably going to be removed. Annual work programme budget instead of fixed cap on the CAPEX is expected.

Full costs recovery

Unlike the BBCs, where there is a high risk of large potential losses, the IPCs probably will envisage full reimbursement of the costs of the investor. In the BBCs, the investors fear that their costs may not be fully paid back. This uncertainty is one of the major shortcomings of the BBCs. In IPCs, the JV might share the costs overrun. This entails that the state, NIOC or a subsidiary, will also bear risks.³⁰²

Balance risk-reward approach

The investors consider that the reward they receive through the BBCs is not worth the risk they are taking. According to Hassanzadeh, in IPCs '[t]he rate of return on investment will be proportionate with the progress made in each phase of the field's development'... and for the first time the Central Bank will guarantee returns.³⁰³ A balance risk-reward approach is a method that increases the motivation of the investors to engage with the Iranian energy sector.

1. Flexible reward considering the oil price change

In the BBCs the investor cannot benefit from the higher oil prices, because there is a fixed reward. IPCs' terms are expected to link the reward to the change of the oil price. In the current global oil price situation this clause might be seen as a minus rather than as a plus. In this regard, the Iranian authorities are taking into consideration the low oil prices and the potential reluctance of the oil companies to engage with new projects. Therefore, an adequate approach reflecting the situation of the market is expected.

Flexible fee for different areas with different risk involved

The remuneration fee is expected to reflect the potential risk of the investment. In this regard, the aging oil fields that need EOR, the risky and more complicated projects will be offered with a higher return fee.

Flexibility for longer term engagement in case of EOR

³⁰⁰ Vakhshouri, "Iran offers"

³⁰¹ Shahri, "The Petroleum Legal Framework of Iran,"

7

³⁰² Ibid.

³⁰³ Hassanzadeh, *Iran's natural Gas*, 93

Greater flexibility would be offered for the aging fields, as they could require faster development and EOR technology. Therefore, the new terms of the contracts could specifically target the attraction of investors in the declining oil fields, which development is a priority for Iran.

Better conditions for the joint oil fields

Another priority for Iran is the development of its joint fields. Thus, similarly to the ones that require EOR, the new contracts probably would give better terms for those that are shared. This could be introduced through a higher remuneration fee for the investors, 'giving them incentive to invest in the joint fields,' according to Creed and Kordvani.³⁰⁴

Cost Saving Index

According to Hassanzadeh, '[i]nvestors will be offered an increased incentive to improve their cost savings, as no longer will any interest be paid on their investment costs, as was the case under buybacks'.³⁰⁵

Flexibility for long term cooperation and long term duration of the contracts (20-25 years)

The new Iranian contracts are said to last between 20-25 years, almost double the BBCs. Longer duration of the contracts gives incentive to the IOCs to increase their investments in the project.

Participation in other exploration projects in the event of no commercial finding of the initial one

Concerning the exploration phase, under the IPCs, when no commercial field is found, there is a possibility for the IOC to be given access to another project. Under the previous contractual systems the investor is not paid back if no commercial field has been found.

Disputes under exclusive jurisdiction of the Iranian courts

Dispute settlement under the exclusive jurisdiction of the Iranian Courts is a term that, if implemented, will most probably not be an

acceptable method for the IOCs. They would prefer a mutually satisfactory dispute resolution clause.

Better transfer of know-how and technology

The IPCs are said to encourage closer cooperation between the Iranian party and the foreign companies. This is achievable through the JV approach and facilitated NIOC-IOC cooperation. From Iranian perspective, its energy sector will benefit if the contracts provide a better plan for transfer of technology and know-how. Additionally, according to Creed and Kordvani, Teheran can 'take advantage of foreign companies' marketing expertise and give Iran access to their supply network to find an export market'.³⁰⁶

To summarise, if the aforementioned changes are implemented, under the new Iranian Integrated petroleum Contracts the IOCs should be able to participate into the Exploration, Development and Production phases, period of 20-25 years, under the form of JV with an Iranian party. The IOC and the NIOC will jointly operate the project and the risk will be shared. Although, natural reserves ownership remains exclusively under the authority of the Iranian states, there might be a positive change in the direction of IOCs being able to book reserves at a certain point. Furthermore, greater flexibility in almost all stages is expected. According to Katebi, the cost recovery is expected to be in the first 5-7 years after the first production. The costs can be divided into:

- Direct Capital Cost (DCC)
- Indirect Capital Cost (IDC)
- Cost of Money (CoM)³⁰⁷

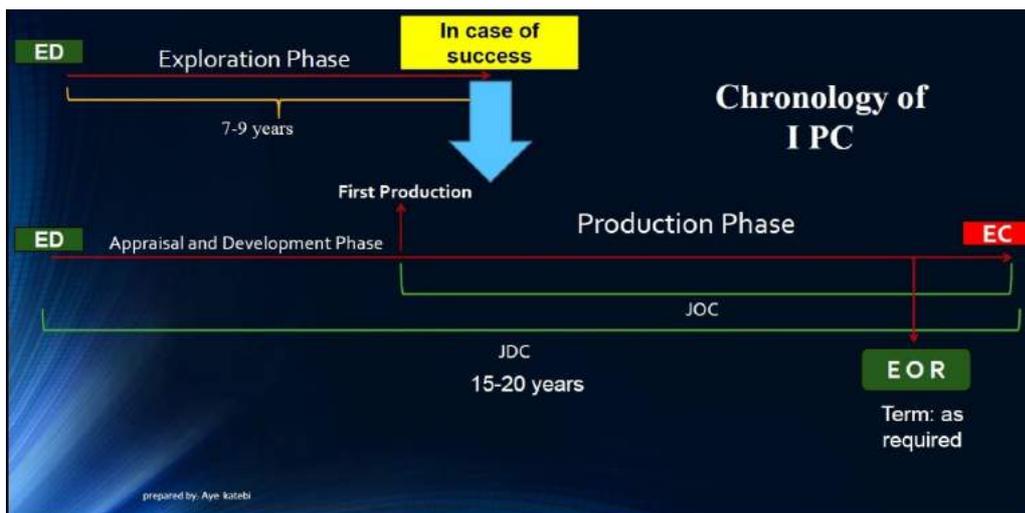
³⁰⁴ Creed & Kordvani, "Iran's new contracts"

³⁰⁵ Hassanzadeh, *Iran's Natural Gas*, 93

³⁰⁶ Creed & Kordvani, "Iran's contracts"

³⁰⁷ Katebi, Presentation, slide 23

Fig 13. Iranian Petroleum Contracts Mechanism.



Source: Aye Katabi presentation

Integrated Petroleum Contracts vs. Buy-Back Contracts

There are signs that most of the risk related factors and shortcomings of the BBCs will be addressed in the new terms of the IPCs.

Booking of reserves remains uncertain and the dispute resolution clause might be unsatisfactory. From the comparison between the BBCs terms, IOCs' expectations and the potential IPCs terms made in the table below it could be concluded that if implemented the IPCs terms should satisfy IOCs' main requirements.

Table 8. Comparison between the Main BBCs' shortcomings, IOC's Expectations, and IPCs' potential terms

Main BBCs' shortcomings	IOCs' Expectations	IPCs' potential terms	
Fixed CAPEX cap CAPEX overrun no recovery of the additional costs	Flexibility in setting the capex guarantees for full recovery of the invested capital	Annual Work Programme and Budget Full costs recovery	☑
Not fulfilled pre-negotiated terms no realisation of the RF or cost recovery	More flexible contractual terms	Participation in other exploration projects, in the event of no commercial finding More flexible Development Plan	☑
Fixed RF no incentive for the IOC to take greater risk	Risk related reward	Balance Risk-reward approach Flexible fee for different areas with different risk involved	☑
No production ownership No IOC's participation in the production phase no IOC engagement	Booking of reserves Integration of the production phase, through joint ventures	Booking of Reserves questionable Integration of the exploration development and production phase Joint ventures	? ☑
No benefit from higher oil prices	Prices sensitive benefit	Flexible reward considering the oil price change	☑
Short period (5-7years)	Longer period	Longer (20-25years)	☑
Slow decision-making process	Less involvement of the Iranian authorities	Reforming decision making	☑
No satisfactory dispute settlement	Mutually satisfactory dispute settlement	Disputes resolution under exclusive jurisdiction of the Iranian courts	-

Source: Author's own table

Iranian Petroleum Contracts' Potential Weak Points

The concrete setbacks of the new Iranian contracts can be examined only after the official introduction of the IPCs. However, in general, reserves ownership is one of the most important clauses for both Iran and the IOCs. If a form through which IOCs can list production is available in the IPCs, this may cover up for any IPCs' shortcomings. The risk sharing is a problem that has been valid for the BBCs and it might be as well for the IPCs. This will depend on the exact way the IPCs terms are formulated. Another shortcoming could arise from the dispute resolution clause. IOCs will most probably insist on having access to arbitration and international tools of dispute resolutions. Overall, the competitiveness of the contracts will be of crucial importance, since worldwide new energy reserves

holders are emerging on the stage and oversupply is expected in the future.

Conclusion

Iran has gone through almost all of the licensing types: a concession period (1872-1953 the Nationalisation), PAs and JOA (1957 first oil law-1974 The Petroleum Act), Service contracts: Pure service (1987 Petroleum Act-1994 Budget Act) and three phases of buy-back contracts, starting from 1994. Although, there are some remaining concerns, the terms of the new IPCs will be far more attractive than all of the generations of the BBCs. Moreover, the IPCs signal to be in some ways even better than the PSAs and thus they promise to be very competitive. IPCs' successful implementation will mark a turning point for the Iranian energy sector.

Table 9. Iranian Oil Contracts

Period	Contract	Oil Ownership	Risk
1872-1951	Concession	IOC	IOC
1957-1974	PAs/JOA	Iran	IOC
1974-1987	Service Contracts	Iran	IOC
1987-1994	Pure Service Contracts	Iran	Iran
1994-present	Foreign Invests not allowed		
	BBCs	Iran	IOC
2015	IPCs	Iran	IOC/NIOC

Source: Author's own table.

Iran's re-integration into energy markets: Implications

Iran's Return to the Global Oil Stage: impact on Oil Producers and Consumers

The global crude oil market has experienced two dramatic changes in the last couple of years shifts in the energy flows direction and a dramatic drop in oil prices.

The significant fall in oil prices has affected major oil producers and exporters. Lifting international sanctions will lead to additional Iranian oil exports. Adding more barrels to the already oversupplied global oil market will further widen the gap between supply and demand. This will inevitably have an impact on global oil producers and exporters, such as the OPEC states, the U.S. and Russia.

Shifting global energy flows from traditional to new centres of demand, such as Asian markets, points to a new tendency in supplier-consumer chain. Once a major exporter of oil to the EU, Iran will face a new moment of choice—whether to increase significantly its exports to Asia or to re-new its exports to Europe. Alternatively, it might chose to balance between the two and keep a variety of consumers. In all cases, Iran's re-turn to the stage of oil supply will affect global consumers, directly or indirectly.

Drop In Oil Prices

From fairly stable level of around \$110 per barrel the oil price fell with more than 50 per cent in 2014 and became lower than \$50 during March 2015. The reasons behind the drop in oil prices are not only linked to the supply and demand correlation, but they are also related to expectations and multiple economic and political factors. The present tendency of global oil oversupply is a consequence of the North America's shale revolution and the emergence of new oil producing states. The U.S. from a global oil importer transformed into a leading oil producer, affecting the energy flow direction. At

the same time, oil demand, alone, has been influenced by numerous factors, ranging from weather conditions to economic growth, efficiency rates, and changes in consumer states' energy mixes.³⁰⁸ For instance, the decreased growth rates in the EU due to the 2008 financial crisis affected the demand in Europe. Therefore, the interaction of various factors and process led to the oil prices decline.

Contrary to what was expected, OPEC, led by Saudi Arabia, maintained its steady exports and did not curb them to balance the supply versus demand ratio. Following the rationale that the fall in oil prices is due to increased supply from non-OPEC producers, the OPEC states did not reduce their shares, fearing that any decrease in their exports would be automatically filled with corresponding ones from non-OPEC producers.³⁰⁹ Regardless being negatively affected by the oil price drop, the OPEC states, in defend of market share, kept their decision unchanged and further contributed to keeping the price levels low.

Iran, even being to a large extent isolated from global oil markets, through the course of the 2014-2015 Nuclear Talks has indirectly affected the oil price. Only with the announcement of a Framework agreement, reached in Lausanne, Switzerland, in April 2015, the prices fell as much as 5 per cent.³¹⁰ Lifting of sanctions will enable Iran to re-new its oil exports. The expectations for Teheran's export potential vary between 300,000 to 600,000 bbl/d of oil added to global supply within half a year or a year from the beginning of the implementation of the deal. Additionally, with substantial investments and further development of its energy sector, Iran will be able to significantly increase this level within less than 5 years.

³⁰⁸ "Middle East and North Africa Energy Conference" Chatham House. January 26-27, 2015.

³¹⁰ "US Oil Settles down 95 Cents or 1.9 Percent at \$49.14 a barrel". *CNBC*. 2 April, 2015

Teheran's strategy targets are reaching its pre-sanctions production levels and regaining its lost market share. According to B. Zanganeh, the market will eventually regulate itself.³¹¹ However, the market might not be able to recover as quickly as envisaged. EIA estimates that oil prices could drop by \$5-\$15 per barrel in 2016 if sanctions against Iran are lifted.³¹² In this respect the high-cost generating oil producers, such as the U.S. and Canada and the Brazilian deep-water oil extraction, Venezuela or the Arctic projects, which suffer greatly from the low oil price, are going to be affected even more by Iran's return. Teheran's re-appearance on the oil supply stage will also have an impact on its relations with Saudi Arabia, its regional counter party and oil export competitor.

Iran's Re-integration into the Oil Market: Impact on Oil Producers

OPEC as an organisation and the US, Saudi Arabia, Russia, on their own, are the largest and most influential oil producers. The OPEC states have been differently affected by the low oil prices. Member states, such as the Gulf producers or S.A. that have significant foreign currency reserves are dealing with the decrease in oil price better than Nigeria, Venezuela, Iraq and Iran.³¹³ In OPEC, within an already complicated internal dynamic, discussions about Teheran's potential increase of oil export amounts further intensify the competitive relations between S.A. and Iran.

The negative consequences of the low oil prices on the Iranian economy triggered suggestions that S.A.'s decision not to curb its supply and to maintain the price levels low are deliberately designed to suppress its regional adversary, Iran. However, as examined in the previous section, the causes for the low oil prices suggest a multifaceted situation. Nevertheless, it is undoubtedly true that the two powers, S.A. and Iran, are competing for regional leverage and oil

exports will become another field of rivalry between the two.

S.A. is one of the main exporters that filled Iran's supply gaps after the sanctions on Teheran were tightened. Neil Quilliam suggests that Iran, in its aim to regain its market share might lure its previous buyers through offering price discounts. Price cuts for European and Asian markets will undermine S.A.'s exports. Therefore, this will further intensify the competition between Iran and S.A. Eventually, S.A. will have to cut its production. According to N. Quilliam, Riyadh will probably do that silently, through annual closures for technical maintenance, for example. Consequently, Kuwait will feel pressed by S.A. to do the same as well.³¹⁴

For Russia, the oil price drop coincided with the Ukrainian crisis and the EU and U.S. sanctions regime against Moscow. Since oil and gas account for 75 per cent of Russia's exports and for more than a half of its budget revenues, the Russian ruble has been heavily affected by the latest oil market dynamics.³¹⁵ The inflation rate in Russia 'soared to 9.4 per cent and is expected to hit 10%' by the end of 2015.³¹⁶ Additionally, the World Bank points that if the oil price does not recover, Russia's economy will shrink by at least 0.7% in 2015.³¹⁷ Undoubtedly, continual oversupply and low oil prices will have negative effect on Russian economy.

Despite the fact that Iran's potential re-integration into the global oil market might contribute to keeping the prices low, in regard to the Iranian Nuclear Talks, Russia has been seen as an ally to Teheran. In fact, as of April 2015, Iran and Russia have been negotiating oil for food swap deal of common interest, in which Iran will supply Russia with oil in exchange of food deliveries from Moscow. At the same time, it is worth mentioning that S.A. has recently engaged in new relations with Russia. Moscow's help in the construction of 16 nuclear reactors and the signing of a bilateral pact between the two, suggesting creation of an

³¹¹ "Interview Bijan Namdar Zanganeh (English)", Frankfurter Allgemeine Forum

³¹² Adams, Christopher, and Anjali Raval. "European Oil Majors Hold Tehran Talks" *Financial Times*, June 24, 2015.

³¹³ Bowler, Tim. "Falling Oil Prices: Who Are the Winners and Losers?" *BBC News*, January 19, 2015.

³¹⁴ Quilliam, interview.

³¹⁵ Giles, Chris. "Winners and Losers of Oil Price Plunge." *The Financial Times*, December 15, 2014.

³¹⁶ *Ibid.*

³¹⁷ Bowler, "Falling oil prices"

'oil alliance' are some of the latest developments showing intensification of S.A.-Moscow relations.³¹⁸ Furthermore, Saudi Arabia, signed a deal for up to \$10 billion, 'aimed at the agriculture, medicine, logistics, retail and real estate sectors' in Russia, which are lacking investments, due to the sanctions.³¹⁹

Although it seems that a new type of Moscow-Riyadh and Moscow-Teheran relations are emerging, Neil Quilliam comments that substantial future partnership between either Russia and Iran, or Russia and S.A. is unlikely to happen. The historical past has created mistrust between Russia and the two Middle Eastern states. Therefore, potential cooperation between Russia and Iran and Russia and S.A. will probably remain only on the tactical level without expanding to any strategic union on the stage of international relations.³²⁰

Another key international power and actor on the global energy field, the U.S., will also be affected by Iran's re-emergence on the oil market. The North American shale revolution has made the U.S., a traditionally major oil importer, a leading oil producer. Although there is a ban on the U.S. oil exports and the U.S. is to large extent independent from oil suppliers, the state is not isolated from the global oil market dynamics. For instance, the oil price drop negatively affected the shale oil and gas production in the U.S. Shale industry requires higher in cost technology. Therefore, falling oil prices made it less competitive to the less costly production process of the Middle Eastern states. Despite lowering its production level, the U.S. shale industry did not collapse and so far the hydraulic fracturing, used for shale oil and gas extraction, has not banded under the pressure of the energy market dynamics. But if the oil prices remain low, the shale producers' future success will largely depend on reduction of their costs and improvement of their competitiveness. In this regard, a possible Iranian re-integration into the oil markets will create an

even greater challenge to the U.S. producers. From another point of view, unlike the smaller and medium companies, which became the driver of the shale revolution, the major U.S. based IOCs, after the lifting of sanctions concerning U.S. legal persons, will benefit from the new investment opportunities, offered in the Iranian energy sector.

The IOCs have been expressing increasing interest in re-engaging with Iran. European major companies have been showing readiness to re-enter Iran's energy sector, in contrast with American's, which are affected by the complicated domestic attitude towards lifting of sanctions and are acting more cautiously. Representatives of Shell, Total of France, Italy's Eni and Lukoil of Russia are among the companies that are said to be engaged in discussions with their Iranian colleagues.³²¹ Repsol and Statoil are among the companies that were previously in the Iranian energy sector, so they might be among the interested as well. The "new-old" IOCs will probably be BP and Exxon Mobile Cononco Philips and Chevron on a later phase. CNP and Sinopec are the ones still present in Iran and most probably remaining key players there.

Redirection of Global Energy Flows

According to IEA, in the period of 2012 to 2018 oil exports from the Middle East to Asia will increase by 1.2 MMbbl/d, while exports to the US and the Organisation for Economic Co-operation and Development–OECD Europe will shrink by 1 MMbbl/d and 0.3 MMbbl/d respectively.³²² BP states that the global oil trade in 2014 grew by a below average 0.9%, or 490,000 bbl/d, and that the import increase was mainly triggered by China and other emerging economies' oil hunger.³²³ According to Prof. Dr. Friedbert Pflüger, '[a]s the U.S. becomes increasingly energy independent due to higher domestic energy production, the EU will begin to share more dependence concerns

³¹⁸ Alhajji, Anas. "Oil and Gas in the Capitals." *World Oil*, January 2015

³¹⁹ Harder, Christopher. "Saudi Arabia to Invest Up to \$10 Billion in Russia — Energy Journal." *The Wall Street Journal*, July 7, 2015.

³²⁰ Quilliam, interview.

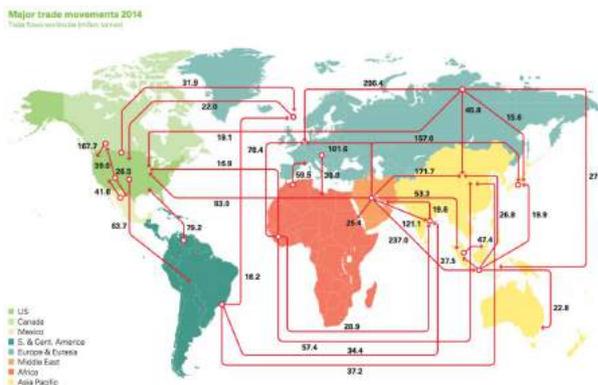
³²¹ Adams, and Raval. "European Oil Majors".

³²² Pflüger, Friedbert. "Changing Global Energy Flows: Crimea Crisis and Beyond" *Energyglobe*, May, 28, 2014

³²³ "Oil Trade Movements." British Petroleum. <http://www.bp.com/en/global/corporate/about-bp/energy-economics/statistical-review-of-world-energy/review-by-energy-type/oil/oil-trade-movements.html> Accessed August 31, 2015.

with Asian states like China than its traditional partner, the U.S'.³²⁴ On the map below, it can be observed that a large portion of the trade flow from the Middle East is being directed to Asia.

Map 6. Major oil trade movements from suppliers' regions to consumers' regions



Source: BP Statistical Review World Energy 2015

The high domestic production in the U.S. has decreased its oil imports. The exporter states, already lured by the growing Asian market, started to re-direct their supplies to Asia. As of April 2015, China, although not significantly, but indicatively surpassed the US in terms of oil imports - 7.4m bbl/d and 7.2m bbl/d, respectively, despite China's economic slow.³²⁵ Experts suggest that the Chinese higher import came from the increased supply from Iran.³²⁶ The increase Iranian oil exports, after the JPOA agreement took effect, were mainly directed to China. In this context, Iran's choice of oil exports destination—Europe, Asia or both, will have an additional impact on the oil trade flows course.

Iran's Re-integration into the Oil Market: Impact on Major Oil Importing States

The EU and Asia, namely China, India, Japan and South Korea are some of the biggest oil importing markets. EU's oil imports, similarly to gas imports, greatly vary between the member states, relying on few key suppliers of crude oil. In 2012, 53.6 % of EU-28 crude oil imports came from

Russia, Norway, and Saudi Arabia.³²⁷ As Eurostat analysis suggests, '[t]he security of the EU's primary energy supplies may be threatened if a high proportion of imports are concentrated among relatively few partners'.³²⁸ Iran used to be a key oil supplier to the EU before the oil embargo. In 2010, the amount of oil supplied by Iran to Europe was 890,000 bbl/d and it was directed to Italy, Spain, France and Greece. After the lifting of sanctions, Iran could contribute to EU's oil security, by renewing its exports to Europe and, thus improving the variety of the EU sources of oil supplies.

According to Mohsen Qamsari, director for international affairs of the National Iranian Oil Company, 'Iran can ship almost half of the supplies of crude previously consumed by the European market,' while '[t]he contracts will be clinched on the basis of spot deals until the European clients finish their existing annual import contracts and are ready for new contracts'.³²⁹ Although Iran is trying to sell its oil in all markets, Qamsari points that Asia will continue to be the country's top priority.³³⁰

Some of the largest consumers of Iranian crude oil and condensate, after the tightened sanctions, are Asian economies, namely China, India, Japan, South Korea. In 2013, Iran exported about 240,000 bbl/d of petroleum products, most of which were fuel oil and LPG sent to Asian markets.³³¹ From the Asian states China is the biggest consumer of Iranian oil, accounting for about half of Iran's oil exports.³³² From the third largest exporter of oil to China, Iran dropped to being the sixth largest, due to the 2012 tightened international sanctions and subsequent reduction of imports from Chinese side. Nevertheless, a new deal between NIOC and Chinese Unipecc is

³²⁷ "Energy Production and Imports." Eurostat. May 1, 2015. Accessed August 31, 2015.

http://ec.europa.eu/eurostat/statistics-explained/index.php/Energy_production_and_imports.

³²⁸ Ibid.

³²⁹ "Iran Says Ready." *PressTV*, May 17, 2015.

³³⁰ Ibid.

³³¹ Ibid.

³³² Rose, Adam, and Chen Aizhu. "UPDATE 2-Iran Oil Officials in Beijing to Discuss Oil Supplies, Projects." *Reuters*, April 7, 2015.

³²⁴ Pflüger, "Changing Global energy flows"

³²⁵ Sheppard, David, and Gregory Meyer. "China Oil Imports Surpass Those of US." *The Financial Times*, May 10, 2015.

³²⁶ Ibid.

expected to lift China's total crude oil contract volumes to above 600,000 bbl/d late in 2015.³³³

South Korea's import of Iranian crude doubled in March 2015 from a year earlier, but Seoul had to decrease the amount it imported from Iran in order to meet the sanctions criteria.³³⁴ In March 2015 'South Korea imported 570,338 tonnes of crude oil from Tehran, or 134,857 bbl/d, compared with 274,808 tonnes a year ago'.³³⁵ India, the second largest consumer of Iranian oil after China and world's fourth biggest consumer, 'bought 367,900 bbl/d of Iranian crude in May 2015, showing an increase of up to 39 per cent compared to a month before', which is a part of an overall year-to-year increase.³³⁶ Japan, has also been reported to have increased its oil imports from Iran.³³⁷ This tendency shows that the Asian states, which are in need of securing energy supply for their economies, have hunger for Iranian oil and might be willing to increase their imports from Iran, in the event of lifted sanctions.

Iran, on the other hand side, expressing interest to export LNG to Asia, has strong motives to increase oil supplies to Asian markets in the future. Firstly, China and India's demand is expected to rise. While at the same time, the European energy strategy envisages increase in alternative sources of energy, instead of conventional hydrocarbons, improved efficiency and tepid demand due to little economic growth. Secondly, geographically Iran and the Asian states benefit from a relatively close distance between each other via water routes. Thirdly, as reviewed in Chapter One, China's oil companies have been investing in the Iranian energy sector. Although their relations are not as successful as probably they have mutually expected, China will remain an important factor in the Iranian energy sector. Additionally, in order to circumvent the sanctions' restriction, Iran has stored a significant amount of

money in Chinese banks.³³⁸ Finally, once being a major oil exporter to the EU, Iran lost its share due the political and international security developments. Most probably, Teheran in its new strategy will seek better diversity of its consumers and less dependency on the Western.

Although the Iranian energy sector is to some extent politicised and affected by the historically negative experience that it had with the Western world, its decisions for energy exports would not be influenced by constructed perceptions of 'allies' and 'enemies'. For Iran the restoration of its economy is a key priority, thus the oil export strategy will be driven by economic and commercial motives. Iran will seek to restore its previous market share and to increase it, by production growth and better efficiency. Additionally, it will probably not want to rely on few consumers. Therefore, Teheran will want a diversity of destinations, which will reduce the likelihood of dependencies.

Iran's potential place in the European Union's gas supply security

EU's energy security

Energy relations have always been central to the European idea. The European Coal and Steel Community (1952) and the Euratom (1957) Treaties, which are in the centre of two communities are based on energy concerns. The energy market in Europe is, however, still very fragmented. EU energy strategies envisage a key step towards reaching a more efficient, secure and competitive energy for Europe through creating an integrated internal energy market and successful development of Europe's domestic resources. In February 2015 the EU leaders marked the beginning of an Energy Union, aiming 'an integrated continent-wide energy system where energy flows freely across borders, based on competition and the best possible use of resources, and with effective regulation of energy markets at EU level where necessary'.³³⁹ Central to the EU's

³³³ Ibid.

³³⁴ "UPDATE 1-S.Korea's March Iran Crude Imports Surge." *Reuters*, April 15, 2015

³³⁶ Bhattacharya, Abheek. "India Won't Pick Up China's Oil Slack." *The Wall Street Journal*, 2015.

³³⁷ "Iran's Crude Sales to Japan up 48%: Report." *Press TV*, April 29, 2015.

³³⁸ "UPDATE 2-Iran oil officials in Beijing " *Thompson Reuters*, 7 April 2015

³³⁹ European Commission 'Communication from the Commission to the European Parliament, the Council, the Economic and Social Committee, the Committee of the Regions and the Investment Bank' A Framework Strategy for a Resilient Energy Union with

energy policy is its Member States' energy security, which has become of great concern, because of the EU's growing energy consumption and supply dependency.

The EU imports more than half of all the energy it consumes. The EU is currently the largest gas importer in the world, and Germany alone is fourth.³⁴⁰ The import dependence is particularly high for crude oil (more than 90%) and natural gas (66%). In 2013 39% of EU's gas import³⁴¹ and 33% of its oil imports³⁴² are from Russia, making Russia the largest energy supplier to the EU. It should be mentioned that Russia is also supplying the EU with uranium and coal. On the other hand, Russia's revenues from its energy exports are of crucial importance for its economy, and the EU being a key market for Russia's fuels makes the EU-Russia relations to a large extent interdependent.

Although the European states-Russia energy relations have been beneficial for both parties for many years and Russia has proven to be a stable energy supplier, the reliance on a single supplier or gas infrastructure owner might make gas supply dependence risky in energy security, economic and political terms. In energy terms, this was proven by the severe outcomes that the Russian-Ukrainian gas crises in 2006 and 2009 had for the states of Central and Eastern Europe. The 2014 the EU energy stress test reveals that the EU can be vulnerable to external energy shocks, especially the member states most dependent on Russian gas, with greater ratio of natural gas in their energy mix and with lack of internal EU interconnections.³⁴³

a Forward-Looking Climate Change Policy Brussels, 25.2.2015 COM(2015) 80 final, .2

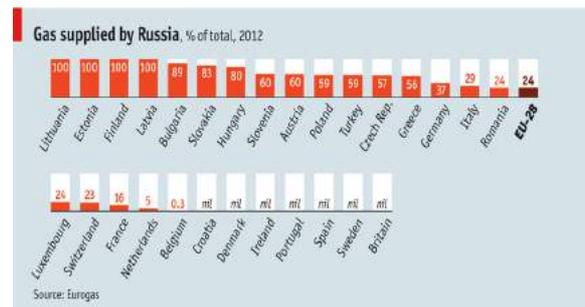
³⁴⁰ "The World Factbook." Central Intelligence Agency. Accessed September 7, 2015. <https://www.cia.gov/library/publications/resources/the-world-factbook/geos/gm.html>.

³⁴¹ EC. Communication from the Commission to the European Parliament and the Council, 'European Energy Security Strategy', COM/2014/0330 final., 1

³⁴² "Energy production and Imports". Eurostat Statistics Explained, last modified on 19 August 2015 http://ec.europa.eu/eurostat/statistics-explained/index.php/Energy_production_and_imports

³⁴³ EC. Communication from the Commission to the Parliament and the Council on the short term resilience of the European gas system Preparedness for a possible disruption of supplies from the East

Fig 14. EU Member States' different scale of gas supply dependence on Russia



Source: Eurostat found in The Economist, *Conscious uncoupling*, 5 April 2014

Although energy interdependence has contributed to the peace in Europe, asymmetrical dependencies in the chain consumer-transit state-supplier may result in political chain of dependencies and can trouble the ability of independent foreign policy of the involved states. During the Ukrainian crisis (2013-current), when the EU strained its relations with its main energy supplier, Russia, the internal divergences between the Member States crystallised. The great difference between the Member States' energy sectors preconditions their individual perception of energy and foreign policy threats. In the most vulnerable to supply cuts Member States, lacking internal EU interconnections, such as the South East European states, the idea that energy security is a matter of national concern, rather than a common EU target, was strengthened.

In this regard, meeting the EU's energy demand securely and comprehensively requires not only sufficient uninterrupted energy supply at reasonable prices through secure transit routes, but also a variety of energy suppliers. Although energy security has been EU's central target for many years, the success of its development and implementation in the EU states have been a slow process. Since energy policy is one of shared competence between the EU and the Member States, the Energy Union intends to improve the coherence and implementation of the EU energy security measures.

The strained EU-Russia relations due to the Ukrainian crisis (2013-present), the insecurity of

during the fall and winter of 2014/2015", Brussels, September 16, 2014 COM(2014) 654 final

the transit routes with its main supplier and the threat of monopolistic prices, have positioned the EU gas supply security higher on the EU's priority agenda. Russia will most probably remain the EU's key energy supplier and the improvement of the EU-Russia relations will be of political, security and economic importance for both sides. But while acknowledging Russian importance for Europe's security and energy security, EU's attempts to broaden the mix of its energy suppliers has to be also accepted as a valid strategy in the context of the interdependent world.

"A Framework Strategy for a Resilient Energy Union with a Forward-Looking Climate Change Policy" of 2015 sets a key target in front of the EC to 'work with Member States to develop access to alternative suppliers, including from the Southern Gas Corridor route, the Mediterranean and Algeria, in order to decrease existing dependencies on individual suppliers'.³⁴⁴ If certain political and security conditions are met, the energy rich Middle Eastern region, the Caspian littoral states, some North African and Mediterranean states, and the Central Asian states are considered viable future options for diversification.

From the Caspian states, Iran is the richest in terms of natural gas and oil reserves. The Iran has the potential to become EU's sixth gas corridor. In April 2015, some developments began in that direction as Turkmenistan³⁴⁵ and Iran³⁴⁶ were suggested for natural gas suppliers to Europe. Iran's importance for the EU's energy and especially gas security has been acknowledged in a number of EU documents that mention the state as a viable potential energy partner, under the conditions of lifted sanctions. 'Iran negotiations, if successful, might lead to a progressive reopening of Iranian oil and gas markets towards Europe', according to Dominique Ristori, Director General for Energy.³⁴⁷

The Southern Gas Corridor and Iran's role

Beyond strengthening our relationship with existing suppliers, a EU policy goal should also be to open the way for new sources. The

establishment of the Southern Corridor and the identified projects of common interest is an important element in this respect, as it prepares the ground for supplies from the Caspian region and beyond....In a first phase it is expected that by 2020 10 bcm/y of natural gas produced in Azerbaijan will reach the European market through the southern Gas Corridor. Moreover, this new pipeline connection is vital in providing a connection to the Middle East. The currently envisaged infrastructure in Turkey could accommodate up to 25 bcm/y for the European market. In the longer-term perspective, other countries such as Turkmenistan, Iraq and Iran, if conditions are met to lift the sanctions regime, could also significantly contribute to the enlargement of the Southern Gas Corridor. A coherent and targeted Foreign policy vis-à-vis these countries will be crucial.³⁴⁸

The EU Energy Security Strategy of 2014 drafts the overall direction of the EU's diversification policy. The main diversification of gas suppliers project, backed by the EU and ranked as the highest energy security priority is the Southern Gas Corridor (SGC). Originally, the Southern Corridor was planned to supply gas to the EU from Caspian and Middle Eastern sources. The Nabucco pipeline aiming at delivering 31 Bcm to Europe, considered to be controversial in both political and economic terms, was the main project of the Southern Corridor (Fig. 15). The pipeline was not realised due to various economic and political reasons. Sanctions on Iran, also played a role in excluding Nabucco from the SGC. Without Iran's gas supplies the pipeline project did not seem viable because of the lack of gas to fill the pipeline capacity.

Fig. 15 Nabucco gas pipeline proposed route



Source: Deutsche Welle. "Nabucco pipeline future uncertain as Hungary backs Russian rival" April 26, 2012

³⁴⁴ EC, "A Framework Strategy for a Resilient Energy Union", 21

³⁴⁵ EC, "Ashgabat Declaration" May 1, 2015

³⁴⁶ "Top Official: Europe May Need Iran Gas." *Press TV*, April 16, 2015.

³⁴⁷ EC, Energy Newsletter January 2015, 1

³⁴⁸ EC, "Energy security strategy 2014", 16

Nabucco, unlike the main character of Verdi's opera, did not manage to save the EU from slavery, if energy dependency might be considered as such. However, other smaller projects, such as the Trans-Adriatic Pipeline (TAP) that goes to Italy via Greece and Albania and the interconnectors between Bulgaria and Greece and Bulgaria and Romania are presently being developed. TAP has the capacity to transport 10 Bcm with a potential to be expanded to 20 Bcm, and has been chosen over the Nabucco West project that was planned to go to Bulgaria and beyond, to Austria via Romania. Additionally, another pipeline project, the Ioanian Adriatic pipeline, that aims to be connected to TAP and transport the gas via Bosnia and Herzegovina to Croatia is planned. Therefore, with the development of these projects the Caspian gas could be transported further to the Central and Eastern European states.

So far, a natural gas pipeline has linked Azerbaijani gas field Shah Deniz 1 to Turkey through Georgia, by the Baku-Tbilisi-Erzurum (BTE) or also called the South Caucasus Pipeline. To BTE an Expansion pipeline is planned to enable the Shah Deniz 2nd phase to reach Turkey and then to be linked to another gas pipeline the Trans-Anatolian (TANAP) pipeline that will reach the Greek border and will most probably be connected to the expected TAP.

Fig 16. South Gas Corridor route



Source: Trefis. "BP Breaks Ground On The Southern Gas Corridor Amid Increasing EU Sanctions On Russia." September 25, 2014

Shah Deniz phase 1 has the capacity to produce around 10 bcm annually and Shah Deniz phase 2 aims to boost this production by additional 16

Bcm.³⁴⁹ Up to 2020 the estimated Azeri gas that will reach Europe is 10Bcm. For a comparison, according to Gazprom statistics, the natural gas Russia supplied to Europe was about 146 Bcm in 2014.³⁵⁰ The infrastructure through Turkey is expected to reach the around 16 Bcm yearly, which is set to rise to 23 Bcm by 2023 and to 31 Bcm by 2026.³⁵¹ Therefore, the infrastructure capacity could allow additional sources of natural gas to join the project. In this relation, Turkmenistan and Iran have been discussed as potential suppliers. According to the EC Energy department, the final diversification aim is to reach 80 to 100 Bcm of gas per year in the future, through potential supplies from the Caspian Region, the Middle East, and the East Mediterranean.³⁵²

Iran as a Transit State

Turkmenistan has been seen as a potential EU gas supplier partner and a pipeline through the Caspian Sea—the Trans Caspian pipeline (TCP) has been respectively discussed. In 1998, the Turkish President and the Turkmen President signed a framework agreement for the implementation of the Trans Caspian Turkmen-Turkey-Europe natural gas pipeline. The pipeline, with a capacity of 30 Bcm/y of gas, was planned to transport natural gas from Turkmenistan to Europe, with 16 bcm/year of supplies reserved for Turkey.³⁵³ Not much development has reported until May 2015, when Turkmenistan, Azerbaijan, Turkey and the EU released a joint declaration referring to the Trans-Caspian Pipeline.³⁵⁴ The

³⁴⁹ "Shah Deniz Stage 2." British Petroleum. Accessed September 7, 2015.

http://www.bp.com/en_az/caspian/operationsprojects/Shahdeniz/SDstage2.html.

³⁵⁰ "Gazprom." Gazprom. Accessed September 7, 2015. <http://www.gazprom.com>.

³⁵¹ Gurt, Marat. "Turkmenistan Inks Deal with Turkey to Supply Gas to TANAP Pipeline." *Reuters*, November 7, 2014.

³⁵² "Gas and Oil Supply Routes." European Commission. Accessed September 7, 2015. <http://ec.europa.eu/energy/en/topics/imports-and-secure-supplies/gas-and-oil-supply-routes>.

³⁵³ Kinnander, Elin. "The Turkish-Iranian Gas Relationship: Politically Successful, Commercially Problematic." *The Oxford Institute For Energy Studies* (2010), 9

³⁵⁴ EC, "Ashgabat Declaration" May 1, 2015 "Turkmenistan Reaffirms Commitment to Southern Gas Corridor - European Commission." Trend News Agency, May 2, 2015. Gurt, Marat. "Exclusive-European Union Sees Supplies of Natural Gas from Turkmenistan by 2019." *Reuters*, May 2, 2015.

preliminary environmental study of TCP was executed with financial support of the EU and the World Bank and is expected to be published before the end of 2015.³⁵⁵

During the last 5 years, the development of the TCP project has been troubled by the Caspian Sea littoral states' different interests. Azerbaijan and Turkmenistan have disputes for oil fields ownership in the Caspian Sea. The Caspian Sea is a zone of Russian influence and Moscow is reluctant to facilitate any pipeline project that is creating direct competition for its natural gas exports to Europe. Iran, another littoral state, has signaled that it is against any such pipeline projects through the Caspian Sea. There is a suggestion for another route—circumventing the sea and including Iran into the project—that could ease some of the tensions. This suggestion points Iran as a transit state for Turkmen gas.

In the beginning of May 2015, an Iranian MP stated that a pipeline through Iran would be "the best, the most logical and security reliable way to transport Turkmen gas to Europe and that the most inexpensive way is to swap gas with Iran".³⁵⁶ It should be mentioned, though, that Ali Majedi explained 'that Iran would be prepared to discuss a swapping arrangement, whereby gas from Turkmenistan would be consumed within Iran on a larger scale, thus freeing up more Iranian capacity for export to Turkey and beyond'.³⁵⁷ In May 2015, Turkmenistan and Iran signed 19 documents on mutual cooperation, focusing on trade, transportation and energy sector. The documents are said not to explicitly refer to the TCP, but the Director of international affairs at National Iranian Gas Company (NIGC), Azizollah Ramezani, suggested that Iran could be considered the best option to increase gas security in Europe.³⁵⁸

Iran as a Natural Gas Supplier

Many gas pipeline projects have been discussed in relation to the Iran-Turkey-Europe axis. A deal between Iran and Turkey to construct a 660km gas pipeline through Turkey to Europe for €1bn, with

a capacity of 18-22 Bcm, linking Iran to the EU via Turkey, where Iran would be responsible for 23% of the project and 77% to Turkish side, has been reported.³⁵⁹ At the same time, there is information for another pipeline under construction—Pars Gas Export Pipeline—going from Iran through Turkey and then to Greece and Italy.³⁶⁰ Another similar project is regarding a deal from 2008 between Turkish energy company Som Petrol—a subsidiary of Turang Transit Transportation (TTE)—and NIGEC for a 5,000km Iran-Turkey-Europe (ITE) pipeline, expected to carry 110 MMcm/d of gas and to transport 35 Bcm/y of natural gas sourced in Iran and Turkmenistan to Germany. The deal stagnated due to the complications of the international situation.³⁶¹

A completely different route, transiting Iraq, Syria and Lebanon to Europe (Greece), known as the Friendship pipeline or the Islamic Pipeline was discussed, but due to the international sanctions and the high security risk of the route, it is a unlike option to be realised especially transferring gas to Europe. A smaller in scale, but more feasible plan to transport gas to Europe can be through the existing and possibly further expanded infrastructure between Iran and Turkey.

Iran-Turkey pipeline

Iran-Turkey gas pipeline is an existing pipeline. It began construction in 1996 and started exporting in 2001. It is 2,577km, with capacity of 28 mcm/d, an annualised 10.22 Bcm and links the northern Iranian city of Tabriz to the Turkish capital Ankara.³⁶² Turkey and Iran are responsible for their parts of the pipeline, thus Turkey is not in breach of the US Iran Sanctions Act (ISA), since it is not practically investing in Iran.³⁶³ At Erzurum, the pipeline is connected to the BTE pipeline.

The exported capacity has never reached the contracted 10 Bcm. There have been supply disruptions due to attacks by the Kurdish separatists and Iranian domestic gas shortages or Turkish oversupply.³⁶⁴ In July 2015, a major

³⁵⁵ Ibid.

³⁵⁶ "Turkmen President Discusses Energy Issues With Italian PM," *Natural Gas Europe*, May 5, 2015.

³⁵⁷ Radtke, Frank and Holmes, Forrest. "Iran and Europe at the crossroads. Ali Majedi on Iranian gas for Europe," *Energyglobe*, 18 July 2014.

³⁵⁸ "Turkmenistan, Iran Sign 19 Documents on Mutual Cooperation." *Natural Gas Europe*, May 11, 2015.

³⁵⁹ Ibid.

³⁶⁰ Ibid.

³⁶¹ Kuhn, *Enabling*.

³⁶² "Iran Oil and Gas Infrastructure Q1 2015."

Business Monitor International Market Overview (BMI). December 19, 2014.

³⁶³ Kinnander, "The Turkish-Iranian"

³⁶⁴ Kuhn, *Enabling*, 240

explosion affected the pipeline in the Turkish side, supposedly caused by the Kurdish Workers Party (PKK).³⁶⁵ Cuts off gas from Turkmenistan to Iran also caused disruption of the Iranian gas supply to Turkey, since Teheran had to use its own gas for domestic purposes, according to Elin Kinnander. Consequently, the Azeri deliveries to Greece, transiting Turkey were used for the domestic needs of Turkey and did not reach Greece.³⁶⁶

Other problems between Turkey and Iran regarding the gas supply are related to the take-or-pay clause in the contract and the price that Iran is selling its gas to Ankara. The clause take-or-pay in the Iran-Turkey contract is one being particularly problematic for Turkey hence the Turkish Ministry of Energy and Natural Resources is 'reviewing take-or-pay conditions in all of the Turkish contracts'.³⁶⁷ Another problem between Ankara and Tehran was that Turkey demanded lower price than the one Iran was willing to sell its gas on. Their dispute was taken to an international arbitration by Turkey.

Despite having problematic relationship, suggestions for expansions and new projects between Iran and Turkey have been discussed. At the beginning of June 2015 Ali-Reza Kameli, Managing-Director of National Iranian Gas Exports Company said 'that if Turkey installs compressors on their own soil, Iran can deliver 2 Bcm/a more gas to Turkey' and that 'Iran has offered to build thermal power plants in Turkey and feed them with Iranian gas'.³⁶⁸

What is problematic for the Iranian side, according to Ali Majedi is that 'Turkey wants to act as a trade partner, re-exporting or selling gas on to Europe', contrary to Iran's vision of Turkey as a transit corridor only.³⁶⁹ In general, Majedi does not envisage any 'major obstacles to the development and expansion of pipeline capacity in the direction of Turkey, and, ultimately, to the prospect that Iran could thus pump an additional 25 Bcm/y westward', corresponding 'to 10 Bcm/y

for Turkish consumption and 15 Bcm/y for transit to the EU'.³⁷⁰ The estimated time for the construction of the needed infrastructure, according to the Iranian experts, will take 3 years.³⁷¹

Since the biggest natural gas field in Iran is situated in the South, Iran first needs to be link it to its Western parts, in order to be able to export any large amounts to Turkey and further to Europe. The expansion of the infrastructure that will enable more gas exports to Turkey is most probably envisaged to be realised by the development of Iranian Gas trunkline 9 (IGAT 9), as Kuhn suggests.

Development of the Iranian domestic pipeline infrastructure

IGAT-9 is also known as Europe Gas Export Line and it is 1,863 km length and has capacity of 100 MMcm/d, out of which 50-60 MMcm/d are for local consumption and the rest will be used for exports.³⁷² The route of IGAT9 starts from East of Assalouyeh and passes through provinces of Khuzestan, Ilam, Kurdistan, and West-Azerbaijan and reaches Turkey's border.³⁷³ According to NIGEC, it is planned to connect the South Pars gas field to the European customers, by reaching Turkey and then proceeding onwards to Europe.³⁷⁴ The project contains 17 gas compressor stations and it is expected to deliver around 35 Bcm/y of Iranian gas to Europe via Turkey.³⁷⁵ IGAT 9 is under construction, but currently suspended due to international sanctions. Iran plans to invest \$8.5bln in the pipeline.³⁷⁶ According to a Memorandum of understanding (MoU) from 2008, signed between Turkey and Iran, the Turkish state Petroleum Company TPAO will be participating in the development of Phases 22, 23 and 24 of South Pars as well as in the construction of the IGAT 9.³⁷⁷ According to the

³⁷⁰ Ibid.

³⁷¹ Ibid.

³⁷² Kuhn, *Enabling*, 237

³⁷³ "Iran oil and Gas Infrastructure Q1 2015," *BMI*

³⁷⁴ Zadeh, S. R. Kassei. "Globalization through LNG and Gas Pricing Mechanism." *International Energy Forum*. November 1, 2008.

³⁷⁵ Kuhn, *Enabling*, 238

³⁷⁶ "Iran Planning to Invest \$8.5bln in IGAT-9 Gas Project." *Fars News Agency*, September 6, 2014. Accessed September 8, 2015.

<http://english.farsnews.com/newstext.aspx?nn=13930615001304>.

³⁷⁷ Kuhn, *Enabling*, 237

³⁶⁵ "Major Explosion Hits Turkey-Iran Gas Pipeline after Suspected PKK Attack." *Today's Zaman*, July 28, 2015.

³⁶⁶ Kinnander, "The Turkish-Iranian," 10

³⁶⁷ Ibid.

³⁶⁸ "Iran, Turkey Agree to Boost Gas Export with Discount." *Natural Gas Europe*, June 15, 2015.

³⁶⁹ Radke & Forrest, "Iran and Europe at the crossroads"

Turkish former minister of Energy, Hilmi Guler, there had been no negotiation on pricing.³⁷⁸ In 2008, Kassaei Zadeh, then advisor to the Oil Minister and Managing Director of NIGC, in a presentation suggested that '[t]here would be same pricing formula for all EU countries at Iran-Turkey border', the '[c]ustomers would be responsible for transit fee and transportation cost depends on final destination'.³⁷⁹

The sanctions on Iran are the main reason for Turkey to be cautious in its approach. Other problems outlined by the Turkish Energy Minister Taner Yildiz in 2014 were that 'despite the deal signed with Iran to develop South Pars, TPAO was "staying on the sidelines".³⁸⁰ In his opinion, there 'has yet to be a decision on whether TPAO will invest in Iran and no such decision will be made until Iran presents a new proposal with new conditions'.³⁸¹ Additionally, the 'ongoing production delays at South Pars, which is being developed by quasi state-owned oil companies such as Petropars and entities affiliated to Iran's Islamic Revolution Guards Corps', is seen as a potential challenge from the Turkish side.³⁸² Ankara is also interested in negotiating 'better and clearer ownership terms' and less contractual risks, in any future deals with Teheran.³⁸³

Gas Prices and Other Challenges

The willingness of both parties, Iran and Turkey, to establish stronger energy relations is arguable. Having a history of disputes regarding their energy relations, E. Kinnander argues that Turkey sees Iran as an unreliable partner.³⁸⁴ The price of the gas seems to be a matter of key importance for both Ankara and Teheran. Turkey imports natural gas primarily from Russia, Azerbaijan and Iran. The prices for a 1000cm of gas, according to Turkish media outlets are: from Iran - \$480, from Russia - \$420 and from Azerbaijan - \$340.³⁸⁵

According to Siamak Adibi, Iran has sold very expensive gas to Turkey, through a heavily indexed oil-based contract which at US\$100/bbl of oil resulted in a US\$14/MMBtu price—well above any other gas Turkey buys. The gas price to Turkey has been used as a norm, rather than an aberration in the past and this has stopped all new deals. Iran needs to adopt a more commercially viable price and softer oil indexation scheme, in his opinion. Iran is close to reaching this conclusion, according to him.³⁸⁶ In 2015 Turkey rejected Iran's proposal for increased supply of Iranian gas, but in late June, Iran's Ambassador to Ankara Ali-Reza Bigdeli confirmed that 'Iran and Turkey have reached agreement in principle on increase in the amount of gas flow from Iran to Turkey as well as relative discount Iran gives to the country'.³⁸⁷

In 2014, Russian President Vladimir Putin announced that the South Stream natural gas pipeline project, originally aiming to reach the European consumers by entering the continent via Bulgaria, was going to orientate towards Turkey. Russia's gas pipeline project aims at delivering 63 Bcm of natural gas to Europe via Turkey by 2020. According to the Turkish Minister of Energy and Natural Resources Taner Yildiz, Russia's Gazprom and Turkish pipeline company Botas have already agreed a 10.25 per cent discount on Russian gas supplied to Turkey.³⁸⁸ Therefore, the competitiveness of the Iranian gas prices will be determinative for both Turkey and Europe.

The future of the so-called Turkish Stream project is yet unclear. Nevertheless, Russia is most likely to remain EU's key energy supplier and in this regard, an influential actor. The signing of a preliminary deal between Gazprom and E.ON, Shell, OMV to expand Nord Stream, according to Gazprom spokesman, Kupriyanov, doubling its capacity to 110 Bcm/a, if materialised, will cement Russia's positions in Europe.³⁸⁹ Apart from the EU-Russia trade and energy relations, Russia has strategic and historically long-standing positions in EU-Russia shared neighbourhood.

³⁷⁸ Ibid., 12

³⁷⁹ Kassaei Zadeh, "NIGEC Globalization"

³⁸⁰ "Türkiye Petrolleri Anonim Ortaklığı (TPAO)." Foundation for Defense of Democracies. August 20, 2014.

³⁸¹ Ibid.

³⁸² Bakir, Siddik, "Turkish government decides not to invest in Iran's South Pars gas field", *Global Insight Daily Analysis*, February 2014

³⁸³ Ibid.

³⁸⁴ Kinnander, "The Turkish-Iranian"

³⁸⁵ "Iran and Turkey agree", *Natural Gas Europe*

³⁸⁶ Adibi, interview.

³⁸⁷ "Iran and Turkey agree," *Natural Gas Europe*

³⁸⁸ "Moscow and Ankara Agree 10.25% Gas Discount for Turkey." *Russia Today (RT)*, March 18, 2015.

³⁸⁹ Marson, James. "Gazprom Signs Preliminary Deal to Expand Gas Pipeline to Germany." *The Wall Street Journal*, 2015.

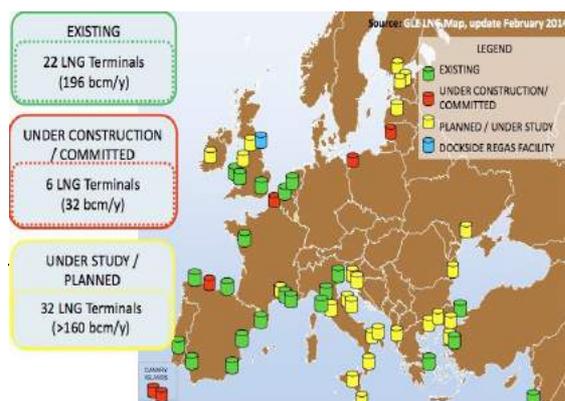
Moscow has been involved directly or indirectly in the South Caucasus most vulnerable zones, the so-called "frozen conflicts"—South Ossetia and Abkhazia (Georgia) and conflict zone between Azerbaijan and Armenia, Nagorno-Karabak. Additionally, Russia has economic and energy relations with Turkey, especially with the announcement of the Turkish Stream. Therefore, dynamics of the Moscow-Ankara relations will also play a role in regard to the EU's diversification projects transiting Turkey. In this context, in terms of energy diversification and pipeline projects in the EU–Russia shared neighbourhood of the Caspian and Black Sea regions, important would be the consideration of the Russian side, as well.

Iran LNG Shipments to the EU

According to the Iranian oil Minister Zanganeh the regional and Asian gas markets are more attractive for Iran. As it has already been pointed out in Chapter One the price will be determinative for Iran's choice of exports destinations. However, if gas exports to Europe are considered, Zanganeh points out that Iran will prefer to ship LNG instead of building pipelines, because pipeline routes hide risks of disruptions, legal difficulties and are subject to tariffs.³⁹⁰ Iran does not have any LNG infrastructure in place at the moment. However, as reviewed in the first Chapter, there are projects that are in advanced stage of development and after the sanctions are lifted Iran will prioritise their conclusion.

LNG imports to Europe are a vital part of EU's energy diversification strategy. Most of the existing LNG terminals are in Western Europe. Building LNG terminals in the Baltic States and South-East Europe is a priority and LNG regasification units have been identified as Projects of Common Interest.³⁹¹

Map 7. LNG terminals and projects in Europe



Source: Thierry Deschuyteneer, Gas Infrastructure Europe (GIE) via Institut Français des Relations Internationales

Maximilian Kuhn' points out that Iranian LNG to Europe will be a more costly project than a pipeline. Since the cost of a LNG infrastructure is higher than the one for pipeline infrastructure, LNG is usually considered for long destinations. However, he evaluates that LNG is the more secure way of transport, which provides more flexibility than pipelines. Pipelines means of transporting natural gas engages the exporter and the consumer with long-term contracts and entails further dependencies on transit states.³⁹² However, upgrading and expanding the existing pipeline infrastructure between Iran and Turkey, would be one logical approach for Iranian natural gas exports to Europe, although less flexible than the LNG option.

The 2014 and 2015 EUCER/KAS/ISD panels on Iran as a re-emerging energy superpower, agreed that, at least, in the mid-term, if any, exports to Europe would most probably be through pipelines. Additionally, Iranian LNG exports projects are not expected prior to 2030.

³⁹² Kuhn, *Enabling*, 79-80

Conclusion

Oil sector: Iran has the world's 4th largest oil reserves. Its production levels have been negatively affected by the sanctions, subsequent lack of foreign investments, combined with a high rate of natural decline of its mature oil fields. Iran's new strategy will target reaching its pre-sanctions production, up to 4.0 MMbbl/d in the first 7-8 months after lifted sanctions and increasing that to about 5.7 MMbbl/d in 3 years. Realistically, a more gradual and moderate increase is expected, as attracting foreign investments will be decisive factor for the speed and rate of growth in production. More than \$100 billion will be needed for the oil sector development, a large amount of which are expected to come from foreign investments. As per the JCPOA, lifting of the sanctions will apply to non-U.S persons, thus the European companies will have the opportunity to enter the Iranian energy sector first. The re-opening of the Iranian energy sector to foreign companies will offer many new opportunities for the IOCs. Iran will prioritise the development of its shared fields with its neighbours and of those needing enhanced oil recovery (EOR) techniques. Iran has potential to become exporter of gasoline and other refined products and basic petrochemical products with the development of its refining and petrochemical industry.

Natural gas: Iran has the world's largest gas reserves. It has large domestic consumption and will continue its policy to allocate natural gas for domestic needs and free more oil for exports. It has started a subsidiary reform in order to regulate the very low domestic natural gas prices and thus improve consumption efficiency. The development of the South Pars gas field will significantly increase Iran's export potential in the future. Iran has well developed gas infrastructure in the South and South-West parts of the state and it is working to expand and improve its pipeline connections with the North and North-West parts, which will facilitate gas exports in these directions. Iran has negotiated and started many gas export projects, which have not moved a lot forward during the last decade, due to the

sanctions and regional problems. In short and mid-term Iran will target the regional gas markets and the completion of its already started export projects, namely the pipeline with Iraq and Oman. No major gas exports to Europe, at least in the mid-term, are expected. The development of Iran's LNG project will be a priority for Iran. LNG exports will probably be directed to Asian markets. Prices will be the determinant criteria for choosing export destinations

Energy sector management: Iran has a complicated and unique political system, in which guarding the sovereign nature of its energy potential is of crucial importance. The historically constructed images of enemies and perceptions of threats have left a visible mark on the management of the Iranian energy sector. Teheran's difficult experience with foreign involvement in the development of its natural resources led to the persistent perception of the Western world and the IOCs, as control-seeking whose self-interests are harmful to Iran. In this regard, the political, economic and legal regime in Iran, altogether reflect Teheran's reluctance to allow foreign interference in its energy sector. There is a tendency signalling that Iran's energy sector management is taking a more pragmatic approach towards foreign investors. The complicated bureaucratic system of the state may cause challenges for the investors but greater domestic opposition is not expected.

Petroleum fiscal regime: There is evidence of a gradual improvement of the fiscal regime in Iran. The potential new terms of the Iranian Petroleum Contracts address the gravest shortcomings of the buy-back contracts. No foreign ownership of natural resources is expected, forms of reserves booking is discussed, though. The interests of the domestic companies will be considered. It is expected that the contracts will encourage the joint venture approach and facilitate technology exchange. The IPCs are said to have more attractive and flexible conditions, including the integration of the exploration and production phases and longer time duration. Overall improvement of the business environment in Iran will also be needed to decrease the level of uncertainty. Additionally, it should be considered

that the severe decrease of the oil prices could make the IOCs even more unlikely to take risks and commit for long-term large-scale investments. Therefore, with the rise of new energy reserves holders on the global stage, the relative competitiveness of the conditions offered from Iran will become a determinative factor.

Potential impact of Iran's re-integration into the oil market: Predictions of the Iranian Oil Minister Zanganeh, are that Iran could increase oil exports by 500,000 bbl/d immediately after any lifting of sanctions. The amount and timing of Iran's oil exports will depend on the domestic production increase, foreign investments in the sector and on the market itself. Additional oil supplies will result in some decrease of the oil prices in the short- and mid-term, but probably will not significantly influence them in the longer-term. Iran's strategy will aim at renewing of its previous market share, including its previous exports to EU states, and increase of its exports to the Asian markets. Potentially this will enhance the competition between Iran and other exporters from the region, especially with its regional political opponent, Saudi Arabia.

Iran's potential place in EU's gas supply security: A number of EU member states rely predominantly on one or few natural gas suppliers, which might threaten their energy security and foreign policy independence. EU Energy Security Strategy of 2014 envisages Teheran, under the condition of lifted

international sanctions, as one of the few possible partners for energy diversification. This could be possible by increasing Iran gas exports to Turkey and subsequently directing the export to Europe through the Southern Gas Corridor infrastructure. Another suggestion is that Iran may become a transit state for Turkmen gas. Questionable is however, if Iran is willing to export its gas to Europe or become a transit state for Turkmen gas. Presently, Iran does not have sufficient natural gas export capacity to fulfil its current projects and engage with new and second, because it has clearly expressed its interest in targeting Asian markets. A potential obstacle in the future, for Iranian gas exports through Turkey will be the price disagreement between the two states and the security threats that might disturb the pipeline infrastructure. Additionally, for the EU it might hide potential concerns of falling into asymmetric dependency if relying on Turkey as a main transit state for most of EU's gas supplier diversification projects. Nevertheless, potential Iranian participation among EU's gas suppliers might be considered an option for improvement of the EU's energy security, creating competing gas prices and alleviating some of the EU's gas supply dependence on limited suppliers, in the long term.

Due to the IOCs interest in investing in Iran's oil and gas sector, in the following years, there will be increasing need of analytical information on the Iranian energy sector and deep research of the domestic political factors influential to its energy sector.

Bibliography

Books, Book Chapters, Academic Journal Articles, Academic Papers, Reports, and other sources

- Alhajji, Anas. "Oil and Gas in the Capitals." *World Oil* January, 2015
<http://www.worldoil.com/magazine/2015/january-2015/columns/oil-and-gas-in-the-capitals>
- Bakhtiari, Ali Morteza Samsam. "OPEC'S Evolving Role: D'Arcy Concession Centennial and OPEC Today - an Historical Perspective." *Oil and Gas Journal* 99 (2001). <http://www.ogj.com/articles/print/volume-99/issue-28/special-report/opecs-evolving-role-darcy-concession-centennial-and-opec-today-an-historical-perspective.html>
- Bill, James A. *The Eagle and the Lion: The Tragedy of American-Iranian Relations*. New Haven: Yale University Press, 1988.
- Brexendorff, Alexander., Ule, Christian and Kuhn, Maximilian. "The Iranian Buy-Back Approach." *Oil, Gas and Energy Law (OGEL)* 1 (2009) <https://www.ogel.org/article.asp?key=2861>
- Farnejad, Hooman. "How Competitive Is The Iranian Buy-Back Contracts In Comparison To Contractual Production Sharing Fiscal Systems?" *University of Dundee, CEPMLP Annual Review : CAR Volume 10* <http://www.dundee.ac.uk/cepmlp/gateway/?news=28066>
- Feng, Zhuo, Shui-Bo Zhang, and Ying Gao. "On Oil Investment and Production: A Comparison of Production Sharing Contracts and Buyback Contracts." *Energy Economics* 42 (2014): 395-402.
doi:10.1016/j.eneco.2014.01.010.
- Ferrier, Ronald. "The Iranian Oil Industry." in *The Cambridge History of Iran Vol. 7*, Edited by Avery, P., Hambly, G., and Melville, C., Cambridge: Cambridge University Press, 1991
- Garvin, R. and Hambly, G. "The Pahlavi Autocracy: Muhammad Riza Shah 1941-1979" in *The Cambridge History of Iran: Volume 7*, edited by Avery, P, Hambly, G., and Melville, C. Cambridge: University Press, 1991
- Garvin, R. and Hambly, G. "The Pahlavi Autocracy: Riza Shah 1921-1941" in *The Cambridge History of Iran: Volume 7*, edited by Avery, P, Hambly, G., and Melville, C. Cambridge: University Press, 1991
- Ghandi, Abbas, and C. - Y. Cynthia Lin. "Oil and Gas Service Contracts around the World : A Review." 2014. http://www.des.ucdavis.edu/faculty/lin/service_contracts_review_paper.pdf
- Hakimian, Hassan. "Iran's Free Trade and Special Economic Zones: Challenges and Opportunities." Conference on Iranian Economy at a Crossroads: Domestic and Global Challenges, University of Southern California (USC) 2009. http://eprints.soas.ac.uk/8297/1/FreeZonesinIran_HH_USCSept2009.pdf
- Hassanzadeh, Elham. *Iran's Natural Gas Industry in the Post-Revolutionary Period Optimism, Scepticism, and Potential*, Oxford Institute for Energy Studies, Oxford University Press, 2014
- Heptulla, Najma. *Indo-West Asian Relations: The Nehru Era*. New Delhi: Allied Publishers, (1991)
- Issawi, Charles. "European Economic Penetration." in *The Cambridge History of Iran*, edited by Avery, P., Hambly, G. R. G. and Melville, C. Cambridge: Cambridge University Press, 1991

Jalo, Ismaila. "The rights to explore petroleum. What manner of rights is best suited for the Iraqi petroleum industry?" University of Dundee. CAR Volume 16 :CEPMLP Annual Review - CAR Volume 16 (2013) <http://www.dundee.ac.uk/cepmlp/gateway/?news=32374>

Khajepour, Bijan. "The Future of the Petroleum Sector in Iran." Future of Iran Series, Legatum Institute (2013) [https://lif.blob.core.windows.net/lif/docs/default-source/future-of-iran/the-future-of-iran-\(economy\)-future-of-the-petroleum-sector-in-iran-pdf?sfvrsn=0](https://lif.blob.core.windows.net/lif/docs/default-source/future-of-iran/the-future-of-iran-(economy)-future-of-the-petroleum-sector-in-iran-pdf?sfvrsn=0)

Kinnander, Elin. "The Turkish-Iranian Gas Relationship: Politically Successful, Commercially Problematic." The Oxford Institute For Energy Studies (2010) <http://www.oxfordenergy.org/2010/01/the-turkish-iranian-gas-relationship-politically-successful-commercially-problematic/>.

Kinzer, Stephen. *All the Shah's Men: An American Coup and the Roots of Middle East Terror*, Hoboken, N.J.: J. Wiley & Sons, Canada, 2003.

Kuhn, Maximilian and Jannatifar, Mohammad "Foreign direct investment mechanisms and review of Iran's buy-back contracts: how far has Iran gone and how far may it go?" *Journal of World Energy and Business Volume 5 Issue 3* (2012): 207-234 <http://jwelb.oxfordjournals.org/content/5/3/207.abstract>

Kuhn, Maximilian. *Enabling the Iranian Gas Export Options. The Destiny of Iranian Energy Relations in a Tripolar Struggle over Energy Security and Geopolitics*. VS Verlag Für Sozialwissenschaften, 2014.

Mahdavi, Paasha. "Oil, monarchy, revolution, and theocracy: a study on the National Iranian Oil Company (NIOC)" in *Oil and Governance. State-Owned Enterprises and the World Energy Supply*, edited by David G. Victor, David R. Hulst and Mark C. Thurber Cambridge University Press, 2011: 234-279

Malek, Dr. Mohammad. "Oil in Iran between the Two World Wars." Iran Chamber Society. Accessed August 23, 2015. http://www.iranchamber.com/history/articles/oil_iran_between_world_wars.php.

Nephew, Richard. "Commentary on the Nuclear Deal between Iran and the P5+1." Columbia SIPA Center on Global Energy Policy, 2015. Accessed September 11, 2015. [http://energypolicy.columbia.edu/sites/default/files/energy/Commentary on the Nuclear Deal between Iran and the P5+1.pdf](http://energypolicy.columbia.edu/sites/default/files/energy/Commentary%20on%20the%20Nuclear%20Deal%20between%20Iran%20and%20the%20P5%2B1.pdf).

Organisation of Petroleum Exporting Countries (OPEC) "Monthly Oil Market Report 14 September 2015" http://www.opec.org/opec_web/static_files_project/media/downloads/publications/MOMR_September_2015.pdf

Shahri, Nima Nasrollahi. "The Petroleum Legal Framework of Iran: History, Trends and the Way Forward." *China and Eurasia Forum Quarterly* 8, no. 1 (2010) http://mercury.ethz.ch/serviceengine/Files/ISN/116116/ichaptersection_singledocument/d7d3a53a-d782-4699-8749-186fb9e4f5b2/en/9.pdf.

Shahri, Nima Nasrollahi. "The Petroleum Legal Framework of Iran: History, Trends and the Way Forward." *China and Eurasia Forum Quarterly*, Volume 8, (2010) <http://www.isn.ethz.ch/Digital-Library/Publications/Detail/?lang=en&id=116116>

Shiravi, Abdolhossein, and Seyed Nasrollah Ebrahimi. "Exploration and Development of Iran's Oilfields through Buyback." *Natural Resources Forum* 30, no. 3 (2006): 199-206, doi:10.1111/j.1477-8947.2006.00114.x.

Stevens, Paul. "An embargo on Iranian Crude Oil Exports: How Likely and with What Impact?" Programme Paper: Middle East and North Africa Programme & Environment, Energy and Resources

Department, Chatham House, January, 1. (2012)

<https://www.chathamhouse.org/publications/papers/view/181293>

Stevens, Paul. "Prospects for Iran's Oil and Gas Sector" Middle East and North Africa Programme & Environment, Energy and Resources Department, Chatham House, March, 5 (2015)

<https://www.chathamhouse.org/publication/prospects-irans-oil-and-gas-sector>

Waqas, Muhammad. "Joint Operating Agreements." *Oil & Gas Financial Journal*. October 9, (2014).

<http://www.ogfj.com/articles/print/volume-11/issue-10/features/joint-operating-agreements.html>

Yeganehshakib, Reza, "Iran's New Generation of Oil and Gas Contracts: Historical Mistrust and the Need for Foreign Investment." *The Journal of Political Risk*, Vol. 3, No. 4, (2015) <http://www.jpolorisk.com/irans-new-generation-of-oil-and-gas-contracts-historical-mistrust-and-the-need-for-foreign-investment/>

Documents, Legal Acts and others

European Commission. "Ashgabat Declaration" May 1, 2015 https://ec.europa.eu/commission/2014-2019/sefcovic/announcements/ashgabat-declaration_en

European Communication. "From the Commission to the European Parliament and the Council, 'European Energy Security Strategy.'" COM/2014/0330 final., 1 <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52014DC0330&from=EN>

European Communication. "From the Commission to the Parliament and the Council on the short term resilience of the European gas system Preparedness for a possible disruption of supplies from the East during the fall and winter of 2014/2015", Brussels, September 16, 2014 COM(2014) 654 final https://ec.europa.eu/energy/sites/ener/files/documents/2014_stresstests_com_en.pdf

European Commission. "Communication from the Commission to the European Parliament, the Council, the Economic and Social Committee, the Committee of the Regions and the Investment Bank' A Framework Strategy for a Resilient Energy Union with a Forward-Looking Climate Change Policy Brussels, 25.2.2015 COM(2015) 80 final http://ec.europa.eu/priorities/energy-union/docs/energyunion_en.pdf

Iran Chamber Society. "Iran Chamber Society: The Constitution of Islamic Republic of Iran." <http://www.iranchamber.com/government/laws/constitution.php>. Accessed August 23, 2015.

"Joint Comprehensive Plan of Action" (JCPOA), 14 July 2015, from European External Action Services (EEAS) Documents on Europa website http://www.eeas.europa.eu/statements-eeas/docs/iran_agreement/iran_joint-comprehensive-plan-of-action_en.pdf

Kurdish Regional Government (KGR) Production Sharing Contract (PSC) http://cabinet.gov.krd/pdf/3_KRG_Model_PSC.pdf

Petroleum Act 1987. Iran <http://www.alaviandassociates.com/documents/petroleum.pdf>

Iran (Islamic Republic of)'s Constitution of 1979 with Amendments through 1989. https://www.constituteproject.org/constitution/Iran_1989.pdf

News and Magazine Articles, Reports and others

Adams, Christopher, and Anjali Raval. "European Oil Majors Hold Tehran Talks." *Financial Times*, June 24, 2015. Accessed July 5, 2015. <http://www.ft.com/intl/cms/s/0/416a0402-1a7f-11e5-a130-2e7db721f996.html#axzz3j5HGovnl>.

Akhlaghi, Dr Behrooz & Associates, "Bi-weekly news & analysis of the international law office." International Law Office, April 7, 2014, <http://www.akhlaghi.net/wp-content/uploads/2014/06/Iran-Petroleum-Contract-IPC-1st-Bi-Weekly-N-A-April-07-2014.pdf>

Atanasova, Slavka. "Iran Set to Pump Oil from Azar Field in 2015." *Arabian Oil and Gas*, October 12, 2014. <http://www.arabianoilandgas.com/article-13011-iran-set-to-pump-oil-from-azar-field-in-2015/>.

Aye Katebi Ms Aye Katebi, Petroleum University of Technology, Oil and Gas Contracts in Iran, Presentation May 2014, http://www.put.ac.ir/_Tehran/documents/p_4-2.pdf

Bakir, Siddik, "Turkish government decides not to invest in Iran's South Pars gas field", *Global Insight Daily Analysis*, February 2014

Bhattacharya, Abheek. "India Won't Pick Up China's Oil Slack." *The Wall Street Journal*, 2015. Accessed September 7, 2015. <http://www.wsj.com/articles/india-wont-pick-up-chinas-oil-slack-1427099552>.

Business Monitor International (BMI), "Market Overview - Iran - Oil And Gas Infrastructure - Q2 2015 2 April 2015." Business Monitor International, BMI Industry Insights - Oil & Gas, Middle East & Africa, 2015.

Business Monitor International Market Overview, "Iran Oil and Gas Infrastructure - Q1 2015.", December 19, 2014. Accessed September 8, 2015.

Bowler, Tim. "Falling Oil Prices: Who Are the Winners and Losers?" *BBC News*, January 19, 2015. Accessed August 31, 2015. <http://www.bbc.com/news/business-29643612>.

CNBC, "US Oil Settles down 95 Cents or 1.9 Percent at \$49.14 a barrel." 2 April, 2015 <http://www.cnbc.com/2015/04/02/reuters-america-us-crude-oil-settles-down-95-cents-or-19-percent-at-4914-a-barrel.html>

Cook, Chris, and Sam Barden. "Iran Petroleum Contract and the Missing Link - Pre-pay." *Teheran Times*, March 3, 2014. Found in Iranian Chamber of Commerce, Industries, Mines & Agriculture, <http://en.iccima.ir/news/iccima-news-bulletin/iran-economy-bulletin/item/8479-iran-petroleum-contract-and-the-missing-link-pre-pay.html>

Creed, Adrian, and Dr Amir Kordvani. "Iran's New Integrated Petroleum Contracts." Clyde&Co, May 11, 2014. Accessed September 10, 2015. <http://www.clydeco.com/insight/updates/view/irans-new-integrated-petroleum-contracts-1>.

DiPaola, Anthony, and Eduard Gismatullin. "BP Says Return on Iraq's Rumaila to Compare With World Fields." *Bloomberg*, July 28, 2009. Accessed September 10, 2015. <http://www.bloomberg.com/apps/news?pid=newsarchive&sid=aM0oM8QAzEDE>.

Villar, Lejla. "Nuclear accord creates potential for additional crude oil production from Iran," *EIA*, August 15, 2015 <http://www.eia.gov/todayinenergy/detail.cfm?id=22492>

European Commission, Energy Newsletter January 2015, p.1 http://ec.europa.eu/energy/en/energy_newsletter/newsletter-january-2015-0

European Dialogue, "Nabucco: Struggle Escalates." Accessed September 7, 2015. <http://eurodialogue.org/energy-security/35>.

Fars News Agency, "Iran Planning to Invest \$8.5bln in IGAT-9 Gas Project." September 6, 2014. Accessed September 8, 2015. <http://english.farsnews.com/newstext.aspx?nn=13930615001304>.

Fars News Agency, "Oil Minister: Persian Gulf Refinery to Make Iran Gasoline Exporter in Early 2015." February 6, 2015. <http://english.farsnews.com/newstext.aspx?nn=13931117000831>

Foundation for Defense of Democracies, "Türkiye Petrolleri Anonim Ortakligi (TPAO).", August 20, 2014. Accessed September 8, 2015. <http://www.defenddemocracy.org/tuerkiye-petrolleri-anonim-ortakligi-tpao/>.

Giles, Chris. "Winners and Losers of Oil Price Plunge." *The Financial Times*, December 15, 2014. Accessed August 31, 2015. <http://www.ft.com/intl/cms/s/2/3f5e4914-8490-11e4-ba4f-00144feabdc0.html#axzz3eMuYiHih>.

Gurt, Marat. "EXCLUSIVE-European Union Sees Supplies of Natural Gas from Turkmenistan by 2019." *Thompson Reuters*, May 2, 2015. Accessed September 7, 2015. <http://uk.reuters.com/article/2015/05/02/turkmenistan-gas-europe-idUKL5N0XT08420150502>.

Gurt, Marat. "Turkmenistan Inks Deal with Turkey to Supply Gas to TANAP Pipeline." *Thomson Reuters*, November 7, 2014. Accessed September 7, 2015. <http://www.reuters.com/article/2014/11/07/turkmenistan-turkey-tanap-idUSL6N0SX2QK20141107>.

Harder, Christopher. "Saudi Arabia to Invest Up to \$10 Billion in Russia — Energy Journal." *The Wall Street Journal*, July 7, 2015. Accessed July 15, 2015. <http://blogs.wsj.com/moneybeat/2015/07/07/saudi-arabia-to-invest-up-to-10-billion-in-russia-energy-journal/>.

Iran Daily, "PEDCO to Drill Three Wells in SP Oil Field." April 19, 2015, <http://www.iran-daily.com/News/116027.html>

Iran Daily, "Yadavaran Project Progresses by 94%." December 28, 2014. <http://www.iran-daily.com/News/58350.html>

Kalantari, Hashem and Motevalli, Golnar, "Iran Oil Minister Says Output to Rise a Week After Sanctions" *Bloomberg*, August 2, 2015 <http://www.bloomberg.com/news/articles/2015-08-02/iran-s-oil-minister-says-output-to-rise-one-week-after-sanctions>

Kalantari, Hashem, "Iran Targets 45 Oil and Gas Projects in Plan to Boost Output," *Bloomberg*, August 13, 2015. <http://www.bloomberg.com/news/articles/2015-08-13/iran-targets-45-oil-and-gas-projects-in-plan-to-boost-production>.

Karimov, Fatih. "Iran's Gasoline Consumption Hits 6.6B Liters in Spring." *Trend News Agency*, July 2, 2015. <http://en.trend.az/business/energy/2412911.html>.

Katzman, Kenneth. "Overview of Iran's Political Economy." Iran Watch. July 25, 2006. <http://www.iranwatch.org/sites/default/files/us-congress-jec-katzman-iran-energy-072506.pdf>.

Kerr, Simeon. "Increased Iran oil output puts other exporters under pressure" *Financial Times*, July 20, 2015 <http://www.ft.com/intl/cms/s/0/ce8b1e3e-2ed9-11e5-8873-775ba7c2ea3d.html#axzz3lcdDJOFW>

Marson, James. "Gazprom Signs Preliminary Deal to Expand Gas Pipeline to Germany." *The Wall Street Journal*, 2015. Accessed September 8, 2015. <http://www.wsj.com/articles/gazprom-signs-preliminary-deal-to-expand-gas-pipeline-to-germany-1434648924>.

Mufson, Steven, "What Ending Sanctions on Iran Will Mean for the Country's Economy," *The Washington Post*, August 12, 2015 http://www.washingtonpost.com/business/economy/what-ending-sanctions-on-iran-will-mean-for-the-countrys-economy/2015/08/12/2c3a9942-3d17-11e5-b3ac-8a79bc44e5e2_story.html

Mokul, J and Singh, P. "India's slippery hold on Farzad-B gas field" *Business Standard*, July 16, 2015 http://www.business-standard.com/article/economy-policy/india-s-slippery-hold-on-farzad-b-gas-field-115071600036_1.html

Nasseri, Ladane and Daya, Ayesha. "Caspian Sea Oil for More Than a Century," *Bloomberg*, May 20, 2012 <http://www.bloomberg.com/news/articles/2012-05-20/iran-finds-first-caspian-sea-oilfield-in-104-years-fars-reports>

Natural Gas Europe, "Iran, Turkey Agree to Boost Gas Export with Discount.", June 15, 2015. Accessed September 8, 2015. <http://www.naturalgaseurope.com/iran-turkey-agree-to-boost-gas-export-with-discount-24334>.

Natural Gas Europe, "Turkmen President Discusses Energy Issues With Italian PM." May 5, 2015. Accessed September 8, 2015. <http://www.naturalgaseurope.com/turkmen-president-discusses-energy-issues-with-italian-pm-23547>.

Natural Gas Europe, "Turkmenistan, Iran Sign 19 Documents on Mutual Cooperation." May 11, 2015. Accessed September 8, 2015. <http://www.naturalgaseurope.com/turkmenistan-iran-sign-19-documents-on-mutual-cooperation-23653>.

Offshore Energy Today, "Iran Eyeing Early Production from Kish Gas Field." February 14, 2013. Accessed August 22, 2015. <http://www.offshoreenergytoday.com/iran-eyeing-early-production-from-kish-gas-field/>

Panda, Ankit. "India, Iran and Oman Open Talks On Deep Sea Gas Pipeline." *The Diplomat*, March 1, 2014. <http://thediplomat.com/2014/03/india-iran-and-oman-open-talks-on-deep-sea-gas-pipeline/>

Petroleum University of Technology, "Oil and Gas Contracts in Iran." May 12, 2014. Accessed September 10, 2015. http://www.put.ac.ir/_Tehran/documents/p_4-2.pdf.

Pflüger, Friedbert. "Changing Global Energy Flows: Crimea Crisis and Beyond" *Energyglobe*, May, 28.2014 <http://energlobe.eu/economy/changing-global-energy-flows-crimea-crisis-and-beyond>

Press TV, "Eni CEO in Tehran for major project" Aug.52015 <http://www.presstv.ir/Detail/2015/08/05/423367/iran-italy-oil-investment-eni->

Press TV, "Iran Accelerates Drilling of Largest Oilfield." June 25, 2015. <http://www.presstv.ir/Detail/2015/06/26/417566/iran-oil-drilling-iraq-azadegan->

Press TV, "Iran Nears Gasoline Refining Milestone." July 3, 2015. <http://www.presstv.ir/Detail/2015/08/03/423110/iran-gasoline-refining-abadan->

Press TV, "Iran's Crude Sales to Japan up 48%: Report." April 29, 2015. Accessed September 7, 2015. <http://www.presstv.com/Detail/2015/04/29/408679/Japan-oil-imports-from-Iran-soars>.

Press TV, "Oil Minister: Iran to Export Gasoline." February 5, 2015, <http://presstv.com/Detail/2015/02/05/396292/Minister-of-Petroleum-Bijan-Namdar-Zangeneh-says-Iran-will-need-no-more-gasoline-imports-next-year-when-a-major-refinery-being-built-in-the-Persian-Gulf-becomes-operational->

Press TV, "Top Official: Europe May Need Iran Gas.", April 16, 2015. Accessed September 7, 2015. <http://presstv.com/Detail/2015/04/16/406624/Europe-need-for-Iran-gas-grows-up>.

PressTV, "Iran Ready to Send Natural Gas to Kuwait via Iraq: Official.", April 12, 2015, <http://www.presstv.com/Detail/2015/04/12/405886/Iran-ready-to-supply-gas-to-Kuwait>.

PressTV, "Iran Says Ready.", May 17, 2015. Accessed June 6, 2015. <http://www.presstv.ir/Video/2015/05/17/411435/Iran-Europe-Oil-Exports>.

PressTV, "Kish Gas Field to Produce 9 Bcm Gas/year.", July 7, 2015. <http://www.presstv.ir/Detail/2015/07/07/419207/iran-gas-field-kish-island-Bijan-Zanganeh-Eshaq-Jahangiri>.

PressTV, "Iran starts testing Iraq gas pipeline", April 18, 2015. <http://www.presstv.com/Detail/2015/04/18/406910/Iran-starts-testing-Iraq-gas-pipeline>

PressTV, "Iran dismisses Saudi petrochemical fears", 19 August, 2015 <http://www.presstv.com/Detail/2015/08/19/425404/iran-saudi-petrochemical-exports-mahdavi>

Radtke, Frank and Holmes, Forrest. "Iran and Europe at the crossroads. Ali Majedi on Iranian gas for Europe," *Energyglobe*, 18 July 2014 <http://energlobe.eu/economy/ali-majedi-on-iranian-gas-for-europe>.

Rose, Adam, and Chen Aizhu. "UPDATE 2-Iran Oil Officials in Beijing to Discuss Oil Supplies, Projects." *Thomson Reuters*, April 7, 2015. Accessed September 5, 2015. <http://www.reuters.com/article/2015/04/07/china-iran-oil-idUSL3N0X32V320150407>.

Russia Today (RT), "Moscow and Ankara Agree 10.25% Gas Discount for Turkey.", March 18, 2015. Accessed September 8, 2015. <http://www.rt.com/business/241949-russia-turkey-gas-discount/>.

Saeed, Shah. "China to Build Pipeline From Iran to Pakistan." *The Wall Street Journal* (WSJ), 2015. <http://www.wsj.com/articles/china-to-build-pipeline-from-iran-to-pakistan-1428515277>.

Sara Vakhshouri "Iran offers new terms for oil contracts." *AlMonitor*, February 26, 2014 <http://www.al-monitor.com/pulse/originals/2014/02/iran-oil-contract-sanctions-energy-nuclear.html###ixzz3I0KW0P6J>

Serafini, Laura. "Oil Major Eni Looks for New Contracts in Iran, Trying to Unlock past Commercial Credits." *Italy24*, July 16, 2015. <http://www.italy24.ilsole24ore.com/art/business-and-economy/2015-07-15/eni-iran-134151.php?uuid=ACd2vxR>.

Shana Petro Energy Information Network, "Yaran Output Set to Rise.". January 12, 2015. <http://www.shana.ir/en/newsagency/232742/Yaran-Output-Set-to-Rise>.

Shana, "Iran Set to Double Oil Exports", April 6, 2015, <http://www.shana.ir/en/newsagency/237962/Iran-Set-to-Double-Oil-Exports>.

Shana, "Iran, World's 3rd Biggest Gas Consumer in '06.", June 27, 2007. <http://www.shana.ir/en/newsagency/108110/Iran-World-s-3rd-Biggest-Gas-Consumer-in-06>.

Shana, "New Phases of South Pars Gas Field Coming Online Soon.", March 17, 2015. <http://www.shana.ir/en/newsagency/237385/New-Phases-of-South-Pars-Gas-Field-Coming-Online-Soon>.

Shana, "NIGC Announces Gas Consumption Figures.", March 16, 2015. <http://www.shana.ir/en/newsagency/237277/NIGC-Announces-Gas-Consumption-Figures>.

- Shana, "NIOC Introducing New Projects at Tehran Oil Exhibition.", April 29, 2015. <http://www.shana.ir/en/newsagency/239685/NIOC-Introducing-New-Projects-at-Tehran-Oil-Exhibition>.
- Shana, "Official Calls for Facilitating Foreign Investments.", August 12, 2015. <http://www.shana.ir/en/newsagency/245336/Official-Calls-for-Facilitating-Foreign-Investments>.
- Shana, "Oil Industry Becoming Efficient in 6th Development Plan." April 20, 2015. <http://www.shana.ir/en/newsagency/239049/Oil-Industry-Becoming-Efficient-in-6th-Development-Plan>.
- Shana, "Oil Industry Becoming Efficient in 6th Development Plan", 20 April, 2015
- Sheppard, David, and Gregory Meyer. "China Oil Imports Surpass Those of US." *The Financial Times*, May 10, 2015. Accessed September 6, 2015. <http://www.ft.com/intl/cms/s/0/342b3a2e-f5a7-11e4-bc6d-00144feab7de.html#axzz3kzkIPJuF>.
- "Post Sanctions Iran: a 5 MMBOPD reality check" *Facts Global Energy*, July 30, 2015 <http://www.fgenenergy.com/corporate-media/fge-in-the-media/post-sanctions-iran-a-5-mmbopd-reality-check.aspx>
- Times of Oman, "Iran-Oman gas project reportedly hits a snag", April 13, 2015 <http://timesofoman.com/article/50595/Business/Iran-Oman-gas-project-reportedly-hits-a-snag>
- The Wall Street Journal, "Lawmakers Seek Sanctions Probe of Iranian Oil Meeting.", Accessed September 10, 2015. <http://blogs.wsj.com/riskandcompliance/2015/01/06/u-s-lawmakers-ask-for-sanctions-investigation-of-iranian-oil-conference/>.
- Thomson Reuters, "UPDATE 1-S.Korea's March Iran Crude Imports Surge.", April 15, 2015. Accessed September 7, 2015. <http://uk.reuters.com/article/2015/04/15/oil-southkorea-iran-idUKL4N0XC17N20150415>.
- Thomson Reuters, "UPDATE 2-Iran Says Will Double Oil Exports in Two Months If Sanctions End.", November 20, 2014. <http://www.reuters.com/article/2014/11/20/opec-iran-saudi-idUSL6N0TA1DT20141120>.
- Today's Zaman, "Major Explosion Hits Turkey-Iran Gas Pipeline after Suspected PKK Attack.", July 28, 2015. Accessed September 8, 2015. http://www.todayszaman.com/anasayfa_major-explosion-hits-turkey-iran-gas-pipeline-after-suspected-pkk-attack_394802.html.
- Trend News Agency, "Turkmenistan Reaffirms Commitment to Southern Gas Corridor - European Commission.", May 2, 2015. Accessed September 7, 2015. <http://en.trend.az/business/economy/2390535.html>.
- Trend News Agency, "Iran, India start new round of energy talks" Economy Review TREIRA English. May 1, 2015 <http://en.trend.az/iran/business/2385598.html>
- Trend, "Iran exporting gas- how, where and when?", 1 April 2015 <http://en.trend.az/business/energy/2375093.html>
- Wood Mackenzie, "Industry Views - Could Iran Nuclear Deal Revive Its Oil and Gas Industry?", July 1, 2015. <http://public.woodmac.com/public/views/Iran-nuclear-deal-and-the-oil-and-gas-industry>.
- Zadeh, S. R. Kassei. "Globalization through LNG and Gas Pricing Mechanism." *International Energy Forum*. November 1, 2008. Accessed September 8, 2015. https://www.ief.org/_resources/files/events/ief---igu-first-ministerial-gas-forum/presentations-kassaei-zadeh.pdf.

Web Sites

2B1st Consulting, "One Day - One Word." August 10, 2012. <http://www.2b1stconsulting.com/technical-service-contracts/>. Accessed September 10, 2015

British Petroleum, "Oil Trade Movements.", <http://www.bp.com/en/global/corporate/about-bp/energy-economics/statistical-review-of-world-energy/review-by-energy-type/oil/oil-trade-movements.html> Accessed August 31, 2015.

British Petroleum, "Shah Deniz Stage 2.", Accessed September 7, 2015.
http://www.bp.com/en_az/caspian/operationsprojects/Shahdeniz/SDstage2.html

British Petroleum (BP) "First Oil." Accessed July 23, 2015. <http://www.bp.com/en/global/corporate/about-bp/our-history/history-of-bp/first-oil.html>.

British Petroleum (BP), "BP in Iraq", Accessed: 05, August 2015
<http://www.bp.com/en/global/corporate/about-bp/bp-worldwide/bp-in-iraq.html>Rumaila

British Petroleum (BP), "Natural gas Reserves"<http://www.bp.com/en/global/corporate/about-bp/energy-economics/statistical-review-of-world-energy/review-by-energy-type/natural-gas/natural-gas-reserves.html>, Accessed, August 2015

British Petroleum (BP), "BP Statistical Review of World Energy June 2015" [bp.com/statisticalreview](http://www.bp.com/statisticalreview), Accessed: September, 2015

IEA – International Energy Agency, <http://www.iea.org>

Center for Free and Special Economic Zones, "Free Economic Zones"
<http://www.freezones.ir/Default.aspx?tabid=137>

Center for FSEZ, "Pars Special Economic Energy Zone" <http://www.freezones.ir/Default.aspx?tabid=401>, Accessed: May 2015

Central Intelligence Agency, "The World Factbook.",
<https://www.cia.gov/library/publications/resources/the-world-factbook/geos/gm.html>. Accessed September 7, 2015.

Encyclopædia Iranica. „Oil agreements in Iran." July 20, 2004. Accessed July 11, 2015.
<http://www.iranicaonline.org/articles/oil-agreements-in-iran>.

European Commission, "Gas and Oil Supply Routes.", Accessed September 7, 2015.
<http://ec.europa.eu/energy/en/topics/imports-and-secure-supplies/gas-and-oil-supply-routes>.

Europa.eu EC, "Energy Gas and oil supply routes" <https://ec.europa.eu/energy/en/topics/imports-and-secure-supplies/gas-and-oil-supply-routes>, Accessed June 2015

Eurostat Statistics Explained, "Energy production and Imports", last modified on 19 August 2015
http://ec.europa.eu/eurostat/statistics-explained/index.php/Energy_production_and_imports

Eurostat. May 1, 2015, "Energy Production and Imports." http://ec.europa.eu/eurostat/statistics-explained/index.php/Energy_production_and_imports. Accessed July 31, 2015.

Frankfurter Allgemeine Forum, "Video Keynote and Live-Interview: Bijan Namdar Zanganeh (English)", Energy Summit Berlin 2015, found on YouTube <https://www.youtube.com/watch?v=c2v1Yra-R9U>

Gazprom, „Gazprom“ <http://www.gazprom.com>. Accessed September 7, 2015.

HSBC, "HSBC's History." <http://www.hsbc.com.hk/1/2/about/home/hsbc-s-history>, Accessed July 20, 2015.

Iran Liquefied Natural Gas Co. "Location of the Facility." August 15, 2015. <http://www.iranlng.ir/en/our-project/location-of-the-facility>, Accessed: July 16, 2015.

Iran Oil & Gas Summit 14-16 December 2015 London, UK." Iran Oil Gas Summit“. CWC Group Ltd. 2015. <http://www.iranoilgas-summit.com>, Accessed: July, 2014

National Iranian Oil Company "Our History." Accessed August 23, 2015. <http://www.nioc.ir/portal/Home/ShowPage.aspx?Object=GeneralText&ID=b0e9e2a0-bb85-494a-9ef5-d9d523e4859a&LayoutID=6b5c97bb-986c-4316-bd29-0b0d3a5d86de&CategoryID=bfbeac61-66b1-4823-be0a-ac710e1fab53#a2>.

National Iranian Oil Refining & Distribution Company. (NIORDC) Website. <http://www.niordc.ir/index.aspx?siteid=77&pageid=536>, Accessed June 13, 2015.

National Petrochemical Company (NPC) website <http://english.nipc.ir>, Accessed: July 2015

Oil Industry Contracts Revision, "Scientific Committee.“, <http://oicr.ir/en/Content/732/ScientificCommittee>. Accessed September 10, 2015.

Pars Oil & Gas Company, "South Pars Gas Field Development Project." <http://www.pogc.ir/Default.aspx?tabid=112>, Accessed August 15, 2015.

SAGE Middle East to India Deepwater Gas Pipeline http://www.sageindia.com/index.php?option=com_content&view=article&id=48&Itemid=54, Accessed September 15, 2015

U.S. Energy Information Administration - EIA - Independent Statistics and Analysis. "Iran International Energy Data and Analysis." <http://www.eia.gov/beta/international/analysis.cfm?iso=IRN>, Accessed April, 2015.

Interviews by the author and Conferences attended by the author

Adibi, Siamak. Interview by author. London, August 17, 2015

Quilliam, Neil. Interview by author. London, August 12, 2015.

Duero, Arash. Interview by author. King's College London, July 20, 2015

Chatham House "Middle East and North Africa Energy Conference" January 26-27, 2015.

EUCERS, Department of War Studies, King's College London (KCL) "1st EUCERS/ISD/KAS Energy Talk 2015"

IRN (International Research Networks), "2nd South Caspian Region Petroleum & Energy 2015 Summit" Vienna, Austria 14-16 April 2015



**European Centre for Energy and
Resource Security (EUCERS)**

**Department of War Studies
King's College London
Strand
London WC2R 2LS
Email info@eucers.eu
Telephone 020 7848 1912**