
Iran's gas exports: can past failure become future success?

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Preface

For those who have worked on international gas trade over the past several decades Iran is an enigma – a country always expected to become a major exporter that became a net importer. For those concerned with the future of international gas trade, it is the perennial “elephant in the room” – a country which could, one day, become a major exporter. Its resource endowment means that Iran can never be ignored in discussions of potential future gas trade, but such discussions need to be tempered both by the history of pipeline and LNG export projects which have meant that, since the 1970s, the country has never been more than a marginal player in international gas commerce. Current relations with the international community, particularly in relations to the international sanctions regimes in force in 2013, eliminate the possibility of all but regional trade for some years.

However, even if the immediate international – as opposed to domestic - prospects may not be encouraging, given Iranian potential it is important for a natural gas research programme to publish this study which reviews the country’s gas sector and future prospects. This paper evolved from David Jalilvand’s UK masters thesis and has taken a while to complete as he has moved on to his doctoral studies in Germany. Given all of his other commitments, I’m very grateful to him for seeing the project through to completion.

Jonathan Stern, June 2013

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Abbreviations

bbl	barrel
bcm	billion cubic metres
bcm/y	billion cubic metres per year
GCC	Cooperation Council for the Arab States of the Gulf
GDP	gross domestic product
JCC	Japanese Crude Cocktail
LNG	liquefied natural gas
mcm/d	million cubic metres per day
mmBtu	million British thermal units
MoU	memorandum of understanding
mtpa	million tonnes per year
NATO	North Atlantic Treaty Organization
NIGC	National Iranian Gas Company
NIGEC	National Iranian Gas Exporting Company
NIOC	National Iranian Oil Company
OECD	Organisation for Economic Co-operation and Development
tcm	trillion cubic metres
\$	US-Dollar

Map 1: Iran's main gas lines



Source: Adibi and Fesharaki 2011, Map 8.1, p.273 (updated)

1 Introduction

While natural gas is increasingly traded internationally Iran, holding the world's second largest reserves, has not become a major exporter. For decades, Iran announced ambitious plans to export gas but in reality the country became a net-importer in 1997 and has remained so. In 2011, 9 bcm in exports were surpassed by imports of more than 10 bcm, almost exclusively from Turkmenistan. Iranian gas exports are limited to relatively small-scale trade with Armenia (0.45 bcm/y), Azerbaijan (0.25 bcm/y), and Turkey (8.4 bcm/y).¹ As a consequence, almost 16% of the world's natural gas reserves remain absent from the regional and global markets.

With the emergence of shale gas, increasing LNG trade, and the U.S. transformation from importer to exporter, global gas is witnessing fundamental change. This change in the international supply would be drastically enhanced if Iran were to establish herself as a major exporter. NIGC² officials have repeatedly declared that they aim for a 10% share of global gas trade.³ In 2011, this would have equalled gas exports of almost 70 bcm.

The crucial question is: how realistic is it to expect Iran to turn past failure into future success when it comes to the export of natural gas and does this constitute a serious aim of the Iranian leadership? This paper discusses both the reasons for Iran's failure to become a major gas exporter and the likelihood for this to change. Of course, any definition of 'major exporter' is entirely arbitrary. In this analysis, 50 bcm/y are used as the threshold, considering that the world's five largest natural gas exporters are all exporting more than this.⁴

The paper is structured as follows. The *second section* discusses Iran's failure in becoming a major gas exporter by reviewing Iran's role in regional and global gas as well as Iran's existing and unaccomplished gas export projects of the past decade. In the *third section*, obstacles to Iranian gas exports are analysed. This includes an examination of sanctions as an external factor as well as the review of the domestic factors 1) subsidies and domestic over-consumption, 2) objections to foreign participation in the energy sector as well as 3) policy and institutional conflicts. The *fourth section* assesses the likelihood for Iran to become a major exporter by the mid-2020s.

¹ BP 2012. According to NIGC managing director Javad Oji, Iran became a net-exporter in the course of the Iranian year 1391 (running from March 2012 to March 2013) with annual exports to Turkey at 7.7 bcm/y and imports from Turkmenistan at 4 bcm/y. Statistics presented by the U.S. Energy Information Administration are in fact suggesting Iran's imports declined in the course of 2012. It remains to be seen whether these figures can eventually be confirmed. See EIA (2013); Mehr News (2013, 29 January).

² National Iranian Gas Company.

³ E.g. Pana News 2012, 16 April); Shana (2010, 16 August).

⁴ The world's top five natural gas exporters in 2011 were Russia (exports of 221.4 bcm/y), Qatar (121.8 bcm/y), Norway (96.8 bcm/y), Canada (88 bcm/y), and Algeria (51.5 bcm/y). See BP (2012).

2 Iran's failure in becoming a significant gas exporter

2.1 Iran's absence in regional and global gas

Despite holding the world's second largest gas reserves, Iran is essentially absent from the regional and global markets. In 2011, the country exported gas to Armenia, Azerbaijan, and Turkey but only 9.1 bcm in total. Iran has basically been a net-importer of natural gas since 1997 (see Appendix 6.1).⁵ The absence of Iranian gas from the international supply is particularly remarkable as both regional and global demand for natural gas increased significantly over the past years and is expected to continue growing substantially.⁶ There are three regional markets which are particularly attractive for Iranian gas exports: the *Arab Middle East*, *Asia*, and *Europe* (through Turkey, currently the only substantial importer of Iranian gas). Each region has distinct economic and political dynamics affecting potential gas imports from Iran.

- The *Arab Middle East* could be a very promising partner for Iran. Arab Middle Eastern countries need to increase their gas imports in the years ahead and Iran, with the world's second largest natural gas reserves, is within pipeline-reach. For both commercial and political reasons, it seems questionable whether these states would want to rely on Qatar as their sole source of supply. If the circumstances would allow, Iran could perfectly provide an alternative but even though several projects were proposed with a variety of countries in the region, none materialized (see Section 2.2.2).
- The tremendous economic growth in *Asia* has been accompanied by a dramatic rise in energy and particularly natural gas demand. Asian countries must increase their natural gas imports and Iran obviously constitutes an interesting source of supply.⁷ However, questions of transportation pose a significant obstacle to imports from Iran.
- Cooperation and trade is also very promising between *Europe* and Iran as Europe seeks to diversify her imports of natural gas and Iran's energy sector could benefit both from European investments and technology. While the current standoff between the West and Iran attracts a lot of attention, one must be careful not to overstate the role of international politics in European-Iranian gas issues. At present, any kind of cooperation or gas trade is more than unlikely for political reasons. But politics cannot alone account for why European-Iranian gas trade did not materialize in the past, when the same advantages of cooperation existed but political tensions have been considerably less and European companies actively engaged in the Iranian energy sector.

Despite expectations to the contrary in the face of this potential for gas exports, Iran did not manage to benefit from the increasing regional and global demand.

⁵ BP (2012); OPEC (2012). Only in 2010 did the country manage to achieve a slightly positive natural gas trade balance of 1.2 bcm.

⁶ IEA (2011), 13, 19.

⁷ See Flower (2008), 360-370.

2.2 *Iranian gas exports*

Iran has tried to increase her exports but failed to become a major exporter of natural gas. Over the years, several projects intended to export Iranian gas were proposed but only the Iranian-Turkish project (8.4 bcm/y in 2011) as well as small-scale trade with Armenia (0.45 bcm/y) and Azerbaijan (0.25 bcm/y) materialized.⁸ The infrastructure for exports to the United Arab Emirates was established in 2008 but a price dispute prevented actual trade. A pipeline to Pakistan and India was planned to start deliveries to Pakistan in 2014. However, while almost operational on the Iranian side, Pakistan only started construction works in early 2013. India's participation is yet unclear for various reasons. Memoranda of Understanding and/or preliminary contracts were signed with Bahrain (2007), Iraq (2011, 2013), Kuwait (2005, 2010), Oman (2007), and Syria (2007, 2011). But most have not been heard of since they were first announced, so it can be assumed that most of these projects have been abandoned. Proposed projects intended to export gas to Europe can be considered as abandoned, too, in the face of the current political standoff. Equally, several LNG projects failed. This section reviews Iran's existing and unaccomplished gas export projects.

2.2.1 *Existing exports*

Turkey Turkey is the only country to which Iran is exporting significant volumes of natural gas, although bilateral gas trade is still at a relatively modest level. Using the Tabriz-Ankara-Pipeline, natural gas trade between the two countries amounted to 8.4 bcm in 2011.⁹ The contract foresees an export volume of 10 bcm/y. Iranian-Turkish gas trade was initiated in the 1990s – despite significant opposition from the U.S., Turkey's important NATO ally. Two major drivers promote the gas trade. Firstly, Turkey's natural gas demand is increasing rapidly with consumption almost tripling from 16 to 45.7 bcm/y in the decade 2001-2011.¹⁰ Secondly, gas exports reflect a general trend of deepening Iranian-Turkish relations. Bilateral trade increased more than tenfold in the same period from \$1 to 11 billion/year.¹¹

Despite this overall positive environment, gas trade between the two countries has been far from smooth and was interrupted on several occasions. Iran at times reduced or halted exports to Turkey to avert shortages in the domestic supply (when Turkmenistan stopped or reduced exports to Iran) and during periods of very cold weather. Similarly, from time to time Turkey refused to import the agreed quantities – officially due to technical problems, but seemingly because of temporary reductions in demand.¹²

The pipeline was moreover repeatedly subject to PKK-attacks.¹³ As Iranian-Turkish relations worsened over the conflict in Syria, there are even reports of Iran aiding the PKK in retaliation for Turkey's support of the insurgents in Syria.¹⁴ While Iran officially rejects these claims, the gas tap (or 'technical problems', a blown-up pipeline, etc.) could become a foreign policy tool for Tehran, should relations with Ankara worsen drastically.

Against this backdrop, it seems questionable whether both countries will honour their 2008 MoU on the deepening of gas trade. The MoU includes Turkish participation in South Pars

⁸ BP (2012).

⁹ BP (2012).

¹⁰ BP (2012).

¹¹ Republic of Turkey Ministry of Foreign Affairs (2011).

¹² Kinnader (2010), 8-19.

¹³ E.g. Reuters (2012, 19 October).

¹⁴ E.g. Today's Zaman (2012, 9 August).

gas production, the construction of a pipeline from South Pars through Iran to Turkey and then Europe, an increase in Iranian exports to Turkey as well as the realization of gas swaps with Turkmenistan (which were already envisaged in the 1990s). It is, however, more than doubtful whether these plans will be realized anytime soon. The Turkish side is seeking a reduction in the price of Iranian gas and has expressed dissatisfaction with the restrictive character of the buyback scheme at South Pars.¹⁵

Armenia In 2008, the presidents of Armenia and Iran celebrated the completion of a gas pipeline from Tabriz to the Armenian grid through which Iranian gas has been exported since 2009. At 2.3 bcm/y, the pipeline's annual capacity reflects the small size of the Armenian market. Actual trade was even smaller and stood at 0.5 bcm in 2011.¹⁶ Gas trade between the two countries is based on a swap deal by which Iran receives electricity from Armenia. With gas from Iran, Armenia seeks to reduce import dependence on Russia.

The rationale of the gas trade with Armenia appears to be rather political than economic. Considering the vast expansion of power production within Iran, there should be no necessity for Tehran to import electricity. Similarly, the export volume to Armenia is marginal. Politically, however, a deepening of Armenian-Iranian relations allows Tehran to expand its influence in the Caucasus, to weaken the position of western-friendly Azerbaijan, and to undermine the U.S. effort to isolate Iran.

Both Tehran and Yerevan hoped to establish Armenia as a transit country for Iranian exports to Europe (through Georgia, the Black Sea, and Ukraine). However, holding a 68% share in the Armenian partner ArmRosGaz, Russia's Gazprom ensured the Iranian-Armenian pipeline only has a diameter of 700mm instead of the once envisaged 1,420mm.¹⁷ As a consequence (apart from other obstacles), the annual capacity of 2.3 bcm is insufficient for exports to Europe.

Overall, and even allowing for interference from Moscow, Armenian-Iranian gas trade illustrates Iran's natural gas export problem in microcosm: It took more than a decade to complete a 140 km pipeline project with a very small volume which could be expected to have been completed in a much shorter time.

Azerbaijan Azerbaijan and Iran operate a swap deal by which Iran receives gas from Azerbaijan and at the same time exports gas to the Azerbaijani enclave of Nakhchivan. A 25-year contract was signed in 2004 and the swap started in the following year.¹⁸ But as with Armenia, volumes are very small. In 2011, Iran imported 0.39 bcm from Azerbaijan and exported 0.25 bcm to Nakhchivan.¹⁹ During the Soviet era, a gas pipeline was built connecting Azerbaijan and Iran from Kazi Magomed (Hajigabul) to Astara. While the pipeline's capacity is stated as 10 bcm/y, apparently only a fraction of this can actually be used as the pipeline is believed to be in dire need of overhaul.

Both countries have expressed interest in increasing natural gas trade. In 2010, Azeri SOCAR announced the construction of a new gas pipeline from Sangachal to Astara with an annual capacity of 6.6 bcm.²⁰ Iran declared her willingness both to import gas from Azerbaijan and to

¹⁵ Kinnader (2010), 8-19.

¹⁶ BP (2012).

¹⁷ Socor (2007).

¹⁸ Adibi and Fesharaki (2011), 289-290.

¹⁹ BP (2012).

²⁰ Upstream (2010, 26 February).

serve as a transit hub for Azeri gas exports in the Persian Gulf and the Gulf of Oman.²¹ However, taking Iran's regional pipeline and LNG export difficulties into account (see below), these proposals have only remote chances of materializing. Indeed, there has been no news of concrete progress on the construction of the pipeline since the announcement in 2010.

In the future, there could be a political and economic rationale for Azerbaijani-Iranian gas trade beyond the supply of Nakhchivan, for which Iran is compensated with a 15% commission on transit fees. With a realistic 'Iranian option', Azerbaijan could certainly improve her negotiating position vis-à-vis Europe and Russia. Should Iran's LNG plans materialize at some point in the future, this could additionally allow Azerbaijan to access the giant Asian market. Iran, for her part, could better meet the rapidly increasing domestic consumption in its Northern provinces and at the same time undermine the U.S. effort to isolate it. Should LNG succeed, Iran could establish herself not only as a major exporter but also as a transit hub for Caucasian (and also Central Asian) gas exports to the global LNG market. These considerations, however, will at best become reality in the far future. On the one hand, Iran would want to export her own gas first. On the other hand, it is uncertain whether Azerbaijan would be willing to place so much reliance on Iran for her exports, considering the periodically tense Azerbaijani-Iranian relations.

2.2.2 Unrealised plans

Over the past decades, Iran repeatedly announced ambitious plans to become a major exporter of natural gas.²² Iranian officials even suggested the country was aiming for a 10% share of international gas trade.²³ These ambitions somewhat corresponded with the expectations of analysts who, as far back as the 1980s, believed that Iran would become a big gas exporter within a decade.²⁴ The following paragraphs examine Iran's proposed projects of the past decade and demonstrate that Tehran failed to live up to its ambitions.

Bahrain In late 2007, Bahrain and Iran signed a MoU with the intention to export 10 bcm/y of Iranian gas from 2010. Bahrain was to be supplied through a pipeline across the Persian Gulf.²⁵ Regardless of possible problems on the Iranian side (see the pricing section on the United Arab Emirates below), Bahrain found itself caught between its own energy needs on the one hand and political dependencies on the other. According to a Wikileaks-revealed U.S.-embassy cable, "[Bahraini] Oil Minister Mirza told the [U.S.] Ambassador November 26 [2007] that although Bahrain had signed an MOU with Iran to ensure that negotiations remained on track, Bahrain continued to hope that a Qatari or Saudi alternative would emerge."²⁶

In fact, the MoU never turned into a concrete contract after Bahrain officially abandoned the plans for the following reasons. First, in 2009 an advisor to Iran's supreme leader Ayatollah Khamenei referred to Bahrain as having historically belonged to Iran.²⁷ Then in 2011 Manama accused Iran of supporting political unrest in the Kingdom.²⁸ Gas trade between the two countries appears to be politically unworkable, considering the tensions between Manama

²¹ Shana (2010, 23 August).

²² See e.g. Shana (2007, 19 September).

²³ See e.g. Pana News (2012, 16 April); Shana (2010, 16 August).

²⁴ Stern (1984), 134.

²⁵ Adibi and Fesharaki (2011), 293.

²⁶ The Telegraph (2011, 18 February).

²⁷ Ynetnews (2009, 24 February).

²⁸ The National (2011, 23 May).

and Tehran over the uprisings in Bahrain, the recent discussions on a closer Bahraini-Saudi alliance, and the stationing of the U.S Fifth Fleet in Bahrain.

Kuwait Oil-rich but gas-short Kuwait sought to increase imports of natural gas as demand exceeds supply in the summer months. Together with Saudi Arabia, Iran and Kuwait share a joint oil and gas field, named Arash in Iran and Dorra on the Arabian side. Tehran and Kuwait-City has repeatedly discussed the possibility of gas exports from the Iranian part of this field to Kuwait, but the countries have not yet reached an agreement over their common maritime border in the Gulf.

In 2005, Iran and Kuwait signed an MoU for Iranian gas exports to Kuwait of 3 bcm/y through a pipeline across the Gulf.²⁹ However, the MoU did not materialize into a contract due to a disagreement over pricing as well as the discovery of domestic gas reserves by Kuwait.

In 2010, Iran announced that the two sides had reached an agreement for gas exports of 8.5 mcm/d (~3.1 bcm/y), again through a pipeline across the Persian Gulf. But very much like in 2005, the parties did not agree on a pricing formula.³⁰

Overall, the situation is unclear. In late 2011 and early 2012, Iran accused Kuwait and Saudi Arabia of “stealing” oil and gas from the joint field.³¹ In January 2012, Iran offered gas from its share of the joint field to Kuwait based on a price formula reflecting the average regional gas price.³² Shortly after, however, Tehran announced the full unilateral development of the field, should Kuwait not accept Iran’s offer for joint development.³³

The availability of (modest) own reserves in Kuwait, the proximity to Qatar, recently started LNG imports, as well as the broader geopolitical rift between Iran and the GCC make gas trade between Iran and Kuwait unlikely.

Oman Iran and Oman signed an MoU on extensive oil and gas cooperation in 2005. Under the memorandum, the countries agreed on Iranian gas exports of more than 8 bcm/y to Oman, the joint development of Iran’s Kish gas field and the joint Hengam oil field, as well as Omani investments in Iranian oil and gas.³⁴ But as with her Persian Gulf neighbours, Iran could not reach an agreement on gas pricing to turn the MoU into a sale and purchase agreement.

As a consequence, gas trade did not materialize and Iran announced the unilateral development of the Kish gas field in 2012.³⁵ Similarly, both countries started to develop the joint Hengam oil field independently, which led to competition for maximum production levels.³⁶

In mid-2011, Iran and Oman held new talks in the course of which an agreement on pricing and the signing of a final contract were announced for the end of the Iranian year 1390 (which

²⁹ Ebrahimi (2007), 99.

³⁰ Fars News Agency (2010, 6 April).

³¹ Platts (2011, 22 December).

³² Naft News Agency (2012, 7 January).

³³ Fars News Agency (2012, 2 February)

³⁴ Shana (2007, 26 June).

³⁵ UPI.com (2010, 8 February).

³⁶ PressTV (2011, 28 December).

ended in March 2012). Gas exports were intended to take place through a spur line from Iran's gas pipeline towards Pakistan through the Gulf of Oman.³⁷

In contrast to most of the other countries on the Arabian Peninsula, Iran's relations with Oman are generally friendly. But despite the absence of geopolitical factors negatively affecting potential gas trade, Iranian exports to Oman still did not materialize.

United Arab Emirates Iran and UAE's Crescent Petroleum signed a 25-year gas contract in 2001, under which Iran would export 5.2 bcm/y of gas from its Salman field in the Persian Gulf through a pipeline to the Emirate of Sharjah. The pipeline was successfully constructed in 2008 but a dispute on pricing prevented the start of exports. Under the agreed price formula, Iran would have received less than \$1/mmBtu. In the same year, Iran announced it would use the gas from the Salman field for domestic consumption and started the construction of a pipeline to this end.³⁸

Officially, Iran cancelled the contract with Crescent Petroleum in 2010.³⁹ But only one year later, Iran's semi-official Fars News Agency reported that the countries had reached an agreement on the question of pricing and signed a new gas contract. While the actual pricing formula was not revealed, the report noted that Iran and UAE agreed on "a price five times more than Qatar's exported gas". However, the contract has thus far not been implemented and is reported to be subject to international arbitration proceedings.⁴⁰

The failure to agree on a pricing formula in the early 2000s reflects a delicate struggle. Allegedly, the plan of the petroleum ministry and NIOC was to start gas exports at a low price and then force the Emirates to pay a higher price by threatening to close the gas tap. At the same time, representatives from several GCC countries trying to prevent an Iranian-Emirati gas trade effectively lobbied hard-line factions of the Iranian Parliament, which in turn called for a higher price and thereby thwarted an agreement.

As Iran has invested heavily – some \$750 million – in a pipeline connecting the Salman field to the domestic market, the likelihood of gas exports to UAE looks remote.⁴¹ Beyond the questions of pricing and economic viability, bilateral relations are strained due to a territorial dispute over three islands in the Persian Gulf, which intensified in 2012.⁴²

With Qatari gas from the Dolphin pipeline going to the UAE as well as plans to import LNG, it can be assumed Iranian exports to UAE are not likely to materialize in the foreseeable future.

Iraq and Syria A 2007 MoU between Damascus and Tehran foresaw pipeline gas exports from Iran to Syria through Turkey. The \$1 billion deal envisaged a volume of 2.8 bcm/y⁴³ but the memorandum did not turn into a contract and was replaced, in the summer of 2011, by a new MoU which included Iraq as well as Syria in the construction of a pipeline with a capacity of over 40 bcm/y (which is 9 bcm/y more than the original Nabucco project). Passing through Iraq, the "Islamic Pipeline" is intended to export gas from South Pars not only to both

³⁷ Shana (2011, 9 July).

³⁸ Adibi and Fesharaki (2011), 290-291.

³⁹ Arabian Business (2010, 7 August).

⁴⁰ Fars News Agency (2011, 10 April).

⁴¹ Adibi and Fesharaki (2011), 291.

⁴² See e.g. Al Arabiya (2012, 12 April).

⁴³ UPI.com (2007, 15 October).

Arab countries but eventually also to Lebanon and through the Mediterranean Sea to Europe. The MoU foresees the export of 3.7 to 5.5 bcm/y to Iraq and 5.5 to 7.3 bcm/y to Syria, starting in either 2013 or 2014. In a later extension, Lebanon would receive 2.6 bcm/y.⁴⁴ This suggests more than 24 bcm of the pipeline's annual capacity is designed for exports to Europe. In February 2013, Iran announced that it had signed a preliminary contract with Iraq for gas exports of 7.3-9.1 bcm/y, beginning as early as summer 2013. The construction of a line to Iraq is reportedly under way.⁴⁵

As opposed to the Arab states of the Persian Gulf, Iran's political relations with both Iraq and Syria are positive, which speaks in favour of the project going ahead. At the same time, however, the chronic instability in Iraq and the currently deteriorating security situation in Syria, pose serious obstacles to any project, let alone a pipeline of this size.

Pakistan and India Of all planned Iranian export projects in 2012, the pipeline towards Pakistan and potentially also India has the greatest likelihood of being realized successfully. Plans for this pipeline emerged in the 1990s but due to strained India-Pakistan relations, substantial negotiations have only taken place since 2005. The 2,670 km Iran-Pakistan-India (IPI) pipeline is intended to deliver South Pars gas to the Balochistan and Sindh provinces in Pakistan as well as Delhi and north-western India. The pipeline's initial capacity is planned to be 22 bcm/y, to be subsequently expanded to 55 bcm/y. In 2009, Iran and Pakistan signed a 25-year contract and agreed upon deliveries of 8 bcm/y from March 2014.⁴⁶ The countries reportedly agreed on a border price of 12% of the 10-month rolling JCC-average plus \$1.10/mmBtu.⁴⁷ The Iranian part of the pipeline from South Pars to Iranshahr is already completed. In March 2013, presidents Ahmadinejad of Iran and Asif Ali Zardari of Pakistan celebrated the commencement of construction of the Pakistani section.⁴⁸ Prior to this, Islamabad and Tehran agreed on a \$500 million loan from Iran for partial financing of the total estimated costs of \$1.5 billion.⁴⁹ Still, Pakistan is struggling to provide finance for the remaining sum.⁵⁰ But overall there is significant progress, distinguishing the Pakistan pipeline from Iran's other export projects and making the prospects of realisation brighter. Beyond this, a news agency affiliated with the Iranian oil ministry reported that Pakistan seeks to increase the level of gas trade to a volume of 30 bcm/y.⁵¹

The prospect of extending the pipeline to India, however, is uncertain. On the one hand, India withdrew from the project in 2008 after she could not find common ground with Pakistan over transit fees and security problems in Pakistan's Balochistan province. Further, the U.S. has exercised massive pressure on India not to go forward with the project. On the other hand, India and Iran have deepened their relations despite U.S.-pressure and even agreed upon several mechanisms to circumvent Western sanctions.⁵² Shortly after construction works started in Pakistan, New Delhi announced it is holding talks with both Iran and the U.S. on the pipeline, which was described by an Indian government official as "beneficial to our country".⁵³

⁴⁴ BBC Farsi (2011, 25 July); Shana (2011, 14 October).

⁴⁵ Mehr News (2013, 8 February).

⁴⁶ Adibi and Fesharaki (2011), 291-293; Handelsblatt (2009, 26 May).

⁴⁷ With a JCC-average at \$100/bbl, this would translate into \$13.1/mmBtu. The author would like to thank David Ledesma for this information.

⁴⁸ BBC News (2013, 11 March).

⁴⁹ Express Tribune (2013, 11 April).

⁵⁰ Express Tribune (2013, 22 April).

⁵¹ Shana (2013, 11 March).

⁵² BBC News (2012, 8 February).

⁵³ Natural Gas Asia (2013, 24 March).

Europe As Europe seeks to diversify her gas imports away from Russia Iran, holding the world's second largest conventional reserves, is a possible alternative. The consortium of the Nabucco pipeline initially considered Iran to be part of the pipeline project to bring Caspian gas to the European market but excluded Iran as a potential supplier in the face of the political situation.⁵⁴ In 2007, the Swiss Elektrizitätsgesellschaft Laufenburg (EGL) announced the conclusion of a 25-year contract with NIGEC on the delivery of 5.5 bcm/y from 2012. EGL and NIGEC intended to use the planned Trans Adriatic Pipeline (TAP) to transport gas from Iran to the European market.⁵⁵ However, in 2010 the TAP consortium ruled out the possibility of transporting gas from Iran "under the current political circumstances".⁵⁶ As the standoff over Iran's nuclear programme intensified, the Swiss-Iranian deal did not translate into actual progress on the ground. On other occasions, Iran stated her willingness to export gas to Greece and Spain.⁵⁷ However, as the European Union put Iran's gas sector as well as gas trade with Iran under sanctions in October 2012, exports to Europe are impossible until that situation improves.

LNG In addition to regional pipeline trade, since the 1970s Iran has repeatedly tried to reach the global LNG market. While the 1979 revolution and the subsequent war with Iraq forced Iran to put her LNG plans aside throughout the 1980s, the Islamic Republic has tried to build liquefaction plants again since shortly after the war.

According to NIGEC, *Iran LNG* at South Pars has the highest priority of all Iranian projects. In June 2012, a South Pars official confirmed to the author that Iran stopped working on her other projects so as to concentrate all efforts on Iran LNG. Having already invested more than \$1.3 billion, Iran LNG is planned to construct two liquefaction trains with a capacity of 5.4 mtpa each (which combined equals almost 15 bcm/y). Partly in cooperation with Chinese and South Korean firms, Iran LNG made good progress on the construction of storage tanks and the utility section. At the same time, however, Iran and her Chinese contractors did not progress at all with regards to the central part of the project, the liquefaction facility. Iran LNG secured a liquefaction technology licence from German Linde but due to European sanctions it is not possible for this project to go ahead.⁵⁸ Regardless of this, NIGEC told reporters in April 2012 that Iran LNG will be ready by the end of 2014.⁵⁹ One year before, when the announced starting date was the end of 2012, an Iran LNG official noted: "We have the technology needed at our disposal".⁶⁰ Experts, however, doubt that Iran can access the latest LNG technology under the current sanctions regime.⁶¹ In 2012, a dispute over the project's finance emerged between Iran and its Chinese partners leading to a suspension of the project "until further notice".⁶²

In 2010, two other LNG projects related to South Pars, *Pars LNG* and *Persian LNG*, were cancelled in the face of international sanctions and political pressure on Iran's international partners – Total and Petronas in Pars LNG, Shell and Repsol in Persian LNG. The two

⁵⁴ ICIS Heren (2010, 24 August). In 2012, the originally planned 31 bcm/y Nabucco pipeline was abandoned in favour of 'Nabucco West' with a capacity of 10 bcm/y.

⁵⁵ Reuters (2007, 4 June).

⁵⁶ TAP (2010, 15 September).

⁵⁷ Ebrahimi (2007), 96-97.

⁵⁸ Adibi and Fesharaki (2011), 295-296.

⁵⁹ Shana (2012, 19 April).

⁶⁰ Bloomberg (2011, 13 April).

⁶¹ Fesharaki (2011).

⁶² International Business Times (2012, 3 September).

projects had planned capacities of 10 mtpa (~14 bcm/y) and 16.2 mtpa (~22 bcm/y) respectively.⁶³

Beyond these three more or less advanced projects, Iran has signed preliminary agreements for various other projects, which did not advance. *Golshan LNG* was planned with a capacity of 10 mtpa (~14 bcm/y), *Lavan LNG* with 2-3 mtpa (~3-4 bcm/y), *North Pars LNG* with 20 mtpa (~28 bcm/y), and *Qeshm LNG* with 3-3.5 mtpa (~4-5 bcm/y). The memoranda of understanding for Lavan LNG and Qeshm LNG have already expired, while Golshan LNG and North Pars LNG have made no progress.⁶⁴

Table 1 lists all the gas export projects envisaged by Iran, although the totals should be viewed with caution. While it is unlikely to assume that all the projects would go ahead simultaneously, a clear strategy or prioritization is missing.

Table 1: Overview of Iran's envisaged gas export projects

<u>By Pipeline:</u>		
<i>Country</i>	<i>Year of contract/latest MoU</i>	<i>bcm/y</i>
Pakistan	2009 (Contract)	8
Switzerland (EGL/TAP)	2007 (Contract)	5.5
Iraq	2013 (Preliminary Contract)	7.3-9.1
Syria	2011 (MoU)	5.5-7.3
Kuwait	2010 (MoU)	3.1
Bahrain	2007 (MoU)	10.2
Oman	2005 (MoU)	8
UAE	2001 (MoU)	5.2
Total envisaged pipeline export quantities		52.8-56.4
<u>By LNG:</u>		
Iran LNG		15
Pars LNG		14
Persian LNG		22
Golshan LNG		14
Lavan LNG		3-4
North Pars LNG		28
Qeshm LNG		4-5
Total envisaged LNG export quantities		100-102
<u>Overall:</u>		
Total envisaged gas export quantities		152.8-158.4

Source: Author's compilation based on section 2.2.2

⁶³ Adibi and Fesharaki (2011), 296-297.

⁶⁴ Adibi and Fesharaki (2011), 297-299.

Table 2: Announced short-term gas export quantities by 2016/17 (Iranian year 1395)

<i>Country</i>	<i>bcm/y</i>
<u>Existing pipeline export contracts:</u>	
Turkey	10
Armenia	2.3
Azerbaijan	0.7 (swap deal)
<u>Announced short-term pipeline exports (no reference to contracts, pricing, etc.):</u>	
Pakistan	9-11
Iraq	9
Bahrain Kuwait Oman UAE	2-4 (no specification of volumes and destinations)
<u>Overall:</u>	
Total announced short-term export quantities	35

Source: Author's compilation based on Fars News Agency (2013, 26 February)

3 Obstacles to Iranian gas exports

Looking at this broad variety of proposed projects as well as Iran's massive conventional natural gas reserves, one central question arises: what accounts for Iran's inability to become a major exporter of natural gas? This section seeks to answer this puzzle by examining both external and domestic factors. It argues the latter are of greater relevance for understanding the absence of significant amounts of Iranian gas from international trade.

3.1 External factors: the limitations of sanctions as an explanation

Since its foundation, the Islamic Republic has been subject to an increasing number of sanctions. While sanctions were imposed for the first time by the U.S. in 1979, the Iranian energy sector was first targeted in 1995 when the U.S. forbade oil and gas trading along with a ban for U.S.-firms to invest more than \$20 million in the country, but did not enforce this rule. Over the years, U.S. sanctions aimed at Iran's access to global finance were expanded. Since 2006, the UN has adopted several rounds of sanctions against Iran. Due to Chinese and Russian opposition, however, Iran's energy sector is not affected by the UN sanctions. Therefore, the U.S. and the EU imposed unilateral sanctions targeting Iran's energy sector. Besides banning investment, EU sanctions prohibit technological support for Iran's oil and gas industry. The U.S. upheld their sanctions on the Iranian energy sector and additionally denied U.S. contracts and finance to firms conducting business in Iran.⁶⁵

But while the sanctions caused some problems for Iran's economy, until 2010 their effect on the Iranian energy sector was rather modest. Before 2010, sanctions concentrating on Iran's ability to access global finance obviously had a negative impact on trade, investment, and the development of energy projects. But ultimately, foreign and in particular European companies were engaged in the Iranian energy market, and high oil prices, as well as investments from Asian countries, compensated for Iran's reduced ability to access global capital.⁶⁶ A 2012 U.S. report notes that since 1999, Iran has signed contracts with foreign partners worth \$82 billion in the gas sector.⁶⁷ This suggests one can reasonably draw the conclusion that until 2010, sanctions "at best [...] slowed down the pace of foreign investment in Iran's energy sector rather than bringing it into a halt".⁶⁸

There is some evidence that the post-2010 EU- and U.S.-sanctions directly targeting Iran's energy sector have significantly increased the impact on natural gas development. By the end of June 2010, all Western companies had announced that they would leave the Iranian market. This move had a serious effect on the development of LNG projects as Chinese and Russian expertise could not provide substitutes for Western technologies. As noted above, Iran's LNG projects had previously encountered various problems and since 2010 effectively failed to progress.⁶⁹ Further, European-Iranian energy cooperation is impossible until sanctions are lifted and political relations improve.

⁶⁵ Petroleum Economist (2010/8).

⁶⁶ Habibi (2008).

⁶⁷ Katzman (2012), 58-62.

⁶⁸ Esfahani and Pesaran (2009), 209.

⁶⁹ Adibi and Fesharaki (2011), 299.

3.2 *Domestic factors*

But overall, sanctions are insufficient to account for Iran's longstanding inability to export gas as their impact was limited until 2010. The following paragraphs examine the effect of domestic factors. While considering that both the size of Iran's population, the development of the economy as well as the nature of the political system and international relations distinguish Iran structurally from other large gas exporters like Qatar, several additional internal obstacles exist. The section starts with a few general reflections on factionalism in Iran, before turning to the impact of subsidies, objections to foreign participation, and policy and institutional conflicts.

3.2.1 *Factionalism in the Islamic Republic's political economy*

A special feature of the Iranian political economy is the particular type of factionalism in the Islamic Republic. While most oil and/or gas states in the Middle East are monarchies with a small and clearly defined power centre, the fragmented political system of Iran's Islamic Republic is complex and diverse. Three different sets of institutions exist in parallel: religious supervisory-bodies led by the Supreme Leader, republican institutions with all three branches of the modern state (executive, legislative, and judiciary), and finally a variety of foundations which are officially governmental bodies but de facto independent. An observer notes that "In practice [...] because of the unequal distribution of power among the branches of government, the Iranian polity is riddled with inefficiencies and systematic paradoxes" and "the state becomes prone to factional rivalries on many levels and in many forms".⁷⁰ Due to these factional rivalries, the government in Iran does not enjoy the full authority to adopt and implement policies – independent from the actual administration believed to be in power. In contrast to a clearly defined decision-making structure, Iran's decentralized system "takes the form of loose coalitions among like-minded individuals or groups and is characterized by personal patronage links."⁷¹ These complexities of Iran's political economy make it extremely difficult for any government to introduce major reforms, as the respective interests of a variety of power centres must necessarily be taken into account. Factional political competition for energy income – mainly from oil – has a severe negative effect on Iran's economic policy and development. While there is a positive and significant direct link in Iran between resource wealth and economic growth, empirical evidence suggests that factional politics have a moderating impact on this effect.⁷² It can be argued that there is an institutional bias in favour of (possibly short-term) factional interests at the expense of rational policies on the basis of a long-term national interest.

3.2.2 *Subsidies and domestic over-consumption*

Until very recently, subsidies were one of the most prominent features of the Iranian political economy. Based on the revolution's theme of social justice and in an attempt to promote economic diversification and industrialization, the Islamic Republic initiated the re-distribution of incomes from oil revenues. Natural gas – besides food, fuel, and electricity – was provided for the Iranian people at highly subsidized prices for the past several decades.

⁷⁰ Moslem (2002), 31-37.

⁷¹ Buchta (2000), 6-7.

⁷² Farzanegan (2011); Farzanegan (2009), 55-76.

With \$80.8 billion or 22.6% of the GDP, in 2010 Iran's subsidies were both in absolute and relative terms the largest throughout the Middle East and North Africa.⁷³

But as in other countries of the region, the subsidies were costly and inefficient.⁷⁴ They hampered the performance of the Iranian economy, for example by discouraging private investment in the energy sector as prices were below production costs. Equally, investments in energy efficient technologies were retarded.⁷⁵ In the gas sector, low prices contributed to lack of incentives to recover around 37 bcm/y, which were flared, vented, or lost otherwise in 2011, representing almost 16% of the country's gross production (see Appendix 6.2).⁷⁶ Iran's level of losses is twice the 8% average of the five largest gross producers (excluding Iran).⁷⁷

Several administrations realized the economic damage caused by subsidies but only in December 2010 were substantial price increases introduced. There is some reason to assume that the government upheld the subsidies to bolster its legitimacy, which otherwise might have been reduced. When the Ahmadinejad administration introduced a first round of – rather modest – price increases in 2007, riots sparked across the country. But besides public unrest, it was also feared a subsidy cut might trigger inflation, hurt the Tehran Stock Exchange, and bankrupt private as well as energy-intensive state enterprises.⁷⁸ Nevertheless, the Ahmadinejad government announced in December 2010 that it would phase out all subsidies. Iran is the first and so far only country in the Middle East and North Africa to embark on a reform programme of this magnitude.⁷⁹

By creating domestic over-consumption and extreme energy inefficiency, the subsidies significantly contributed to Iran's inability to export natural gas. Domestic demand turned Iran into a net importer with no gas left for exports. Before 2007, when prices were increased for the first time, Iran's commercial and household gas prices stood at merely \$0.4/mmBtu and the industry gas price at \$0.53/mmBtu.⁸⁰ These artificial prices promoted excessive consumption and a shockingly inefficient use of energy. In order to create the same unit of value, in 2010 Iran used 6.4 times more energy than the OECD average, 3.6 times more than the world average, and still 1.8 times more than the Middle Eastern average.⁸¹ Behind the U.S. and Russia, Iran is the world's third largest consumer of natural gas. With an annual average growth of 9.3% in the period from 2000 to 2011, Iranian domestic gas consumption grew significantly more than the average annual GDP (4.1%) and at almost the same rate as production (9.5%).⁸²

Under the subsidy reform introduced in December 2010, domestic gas prices will increasingly be linked to a gas export price index. Residential and commercial consumers will have to pay

⁷³ Darbouche (2012), 14.

⁷⁴ See Fattouh and El-Katiri (2012).

⁷⁵ Farzanegan (2011).

⁷⁶ Author's calculation based on Cedigaz (2012), 39.

⁷⁷ USA (7%), Russia (6%), Algeria (10%), Canada (9%), and Qatar (5%); author's calculation based on Cedigaz (2012), 38-39.

⁷⁸ Amuzegar (2011).

⁷⁹ See Darbouche (2012) for a regional analysis.

⁸⁰ Even in comparison to the very low regional standard, Iranian domestic gas prices were artificial. In 2012, domestic gas prices stood at \$.075/mmBtu in Saudi Arabia, \$0.8/mmBtu in Kuwait, \$1/mmBtu in Qatar and the United Arab Emirates. See Darbouche (2012).

⁸¹ Author's calculation based on IEA (2012), 48-57.

⁸² Author's calculation based on BP (2012), 22-23; IMF (2012), 88.

75% of the export price by 2015 and industrial consumers 65% by 2020.⁸³ 75% of the export price index would have translated to gas prices of \$9.8/mmBtu at the end of February 2013 (see Table 3).⁸⁴ In summer 2011, actual prices stood at \$3.1 mmBtu for residential and commercial customers and at \$2/mmBtu for industrial customers.⁸⁵ It was reported in April 2011 that 30% of Iranian gas consumers had failed to pay their gas bills.⁸⁶ But compared to the Russian experience in the 1990s, where some 85% of the bills were unpaid,⁸⁷ 30% seemed a rather good result.

The evidence available does not suggest that the 2010 price increases caused by the introduction of the subsidy reform reduced domestic demand. Iran's total consumption continued to increase throughout 2011 and the first months of 2012, albeit at a slower rate. In previous years, consumption was growing by more than 5%/year whereas in 2011 the increase was 2.7% (see Figure 1 and Tables 4 and 5 below).⁸⁸ The effect of the subsidy reform on this deceleration of growth, however, should not be overestimated. To some extent natural gas consumption fell in response to higher prices but another impact appears to come from the slowdown of economic development. The average real GDP growth in the period from 2000 to 2010 was 4.6% but only 2% in 2011 and -0.8% in 2012.⁸⁹

As the economy rebounds, growth of domestic gas consumption is likely to resume. A new consumption peak of 570 mcm/d was reported in January 2013.⁹⁰ NIGC is forecasting starkly increasing consumption levels for the upcoming years. According to the company's calculations, domestic peak demand will reach 800 mcm/d in 1392 (2013/14), 895 mcm/d in 1393 (2014/15), and 950 mcm/d in 1394 (2015/16).⁹¹ In comparison, peak consumption stood at 437 mcm/d in 2007, 480 mcm/d in 2008, 501 mcm/d in 2009, 529 mcm/d in 2010, and 551 mcm/d in 2011.⁹²

At the same time, the future of the subsidy reform is unclear. In November 2012, Iran's Parliament blocked the implementation of the reform's second round. As a consequence, increases in domestic (gas) prices are suspended for the time being and the future of the reform itself is consequently unclear. While the official reason for halting the reform was to prevent inflation from increasing further, Iranian politics is witnessing a severe standoff between the legislative body and the Ahmadinejad government. Thus, in the best case, the implementation of the reform programme will be continued after the June 2013 presidential elections, which will end Mahmoud Ahmadinejad's two terms in office.

Against this backdrop, it remains to be seen whether and how the subsidy reform, if implemented, is going to reduce the growth in gas consumption to an extent which is significantly below the growth of production. Only this would allow Iran to overcome being a net importer and to create the much-needed capacity to increase exports. In any case, there are additional domestic factors affecting Iran's ability to export natural gas.

⁸³ The natural gas export price index is calculated against the JCC as follows: $P = 0.118 \times JCC - 0.215$ - Adibi (2011).

⁸⁴ On 28 February 2013, the JCC stood at \$113.20/bbl.

⁸⁵ Adibi (2011).

⁸⁶ Amuzegar (2011).

⁸⁷ Stern (2005), 49-50.

⁸⁸ Author's calculation based on NIGC (2013).

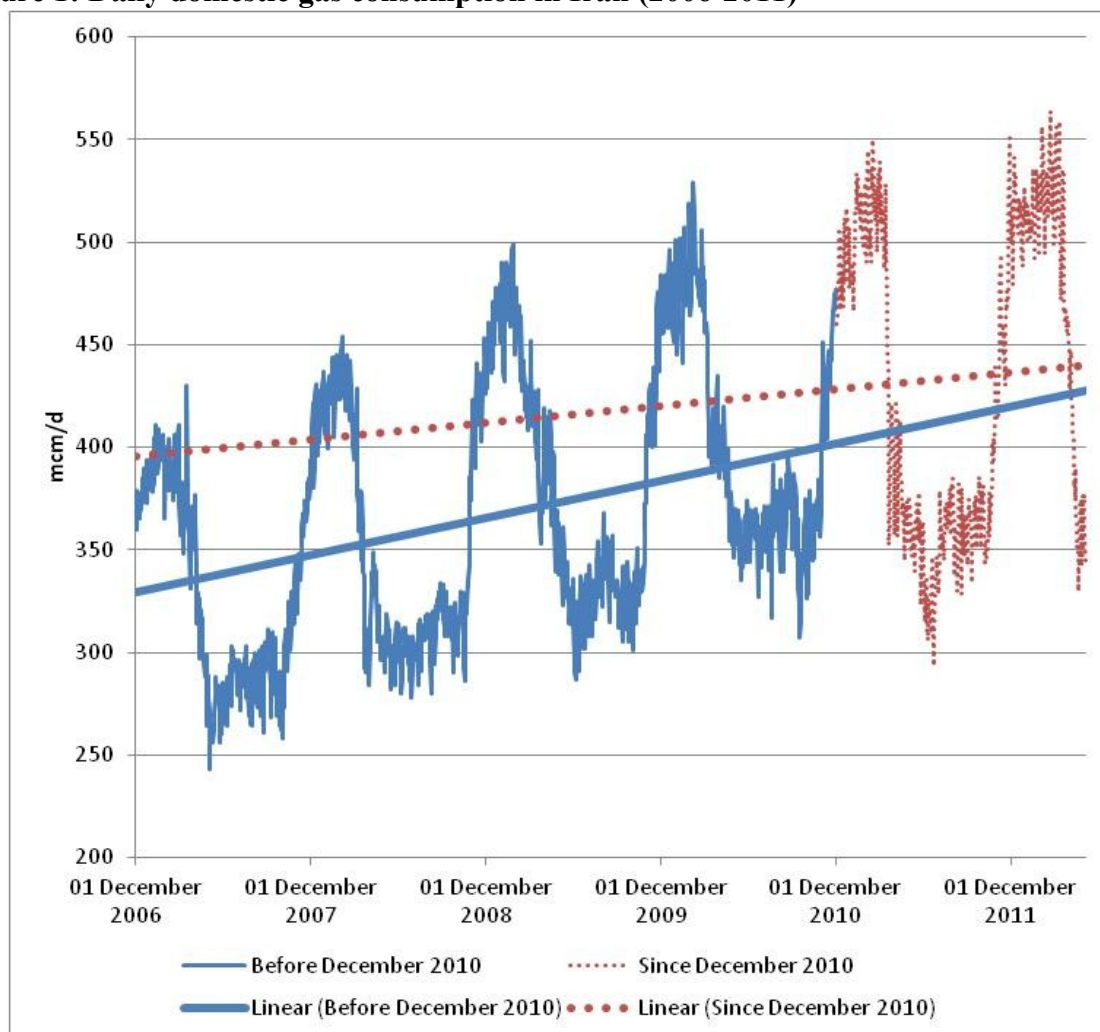
⁸⁹ IMF (2012), 88.

⁹⁰ Shana (2013, 16 January).

⁹¹ Shana (2013, 19 February).

⁹² Author's calculation based on NIGC (2013).

Figure 1: Daily domestic gas consumption in Iran (2006-2011)



Domestic gas consumption continued to increase after the introduction of the subsidy reform in December 2010, albeit at a slower rate.

Source: NIGC (2013)

Table 3: Domestic Iranian natural gas prices

	pre-2007	Summer 2011	by 2015/2020
Residential and commercial	\$0.4/mmBtu	\$3.1/mmBtu	75% of export price index (2015) (at the end of February 2013, this would have been \$9.8/mmBtu)
Industrial	\$0.53/mmBtu	\$2.0/mmBtu	65% of export price index (2020) (at the end of February 2013, this would have been \$8.5/mmBtu)

Note: the prices in \$ reflect the official exchange rates of the respective time. Domestic gas prices were increased for the first time in 2007 and then by the subsidy reform from December 2010. The implementation of the reform's second phase was halted by Parliament in November 2012. It is thus uncertain whether the 2015/2020 targets will be met.

Source: Adibi (2011)

Table 4: Annual domestic natural gas consumption (bcm)

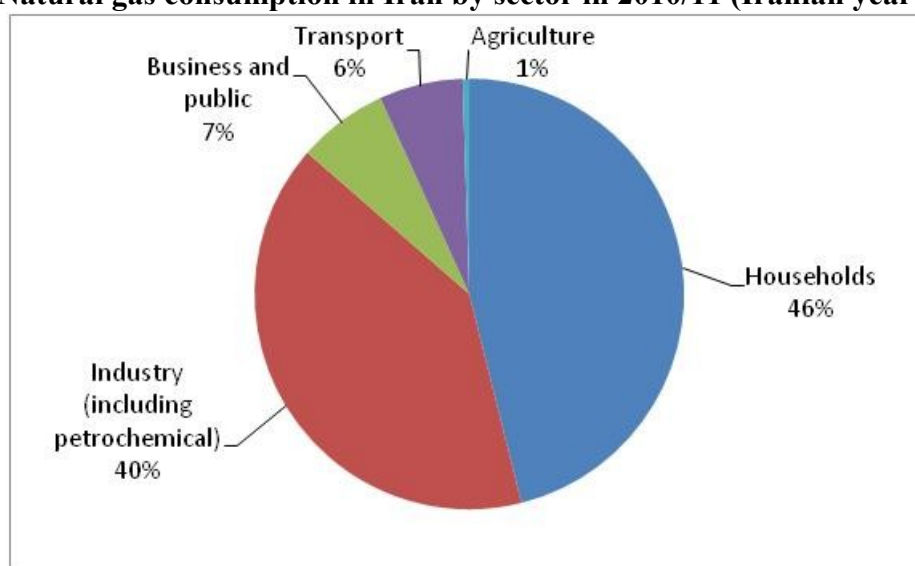
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
BP data	79.2	82.9	86.5	105.0	108.7	113.0	119.3	131.4	144.6	153.3
NIGC data						120.3	130.0	139.4	147.7	151.6

Source: BP (2012); NIGC (2013)

Table 5: Annual changes in domestic natural gas consumption (%)

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
BP data	13.0	4.6	4.4	21.3	3.5	4.0	5.5	10.1	10.1	6.1
NIGC data							8.0	7.2	5.9	2.7

Source: BP (2012); NIGC (2013)

Figure 2: Natural gas consumption in Iran by sector in 2010/11 (Iranian year 1389)

Source: Ministry of Energy of the Islamic Republic of Iran (2012)

3.2.3 Objections to foreign participation

For more than a century, energy has been at the heart of Iranian politics. Iran was never formally colonized, but for several decades Britain extracted enormous rents at the expense of the Iranian nation. Using the so called *D'Arcy Concessions*, Iran received a mere 16% of all annual net profits while the Anglo-Iranian Oil Company (AIOC) was able to enjoy windfall incomes. After Prime Minister Mohammad Mossadegh nationalized the AIOC and Iran's energy resources, the CIA orchestrated a coup installing the pro-Western Shah Mohammad Reza Pahlavi as the undisputed ruler.

Objections to foreign participation were introduced following the 1979 revolution. As Iran's experience in the nineteenth and twentieth centuries showed foreign investment and activities as primarily exploitative, the Islamic Republic's constitution was shaped by the desire to control the terms of any engagement with foreign companies.⁹³ This suspicion applies to both Western and Eastern countries and companies. In response to British, Russian, and U.S.

⁹³ Hakimian (2011).

attempts to control the Iranian economy, a “struggle for economic independence” was initiated and continues to dominate the Iranian political economy until today. The “desire to protect against the threat of intrusions from the outside world has been of central importance” to the Islamic Republic.⁹⁴ This results in a “schizophrenic paradox.” While suspecting Western companies of operating against the Islamic Republic, Iran at the same time is seeking their investments and technologies. Thus, the central and yet unresolved question in the Iranian economic discourse is how to reconcile these tendencies.⁹⁵ Iran’s political-economic discourse is therefore “inherently political in nature” and characterized by a lack of a detailed strategy.⁹⁶

In the energy sector, this translated itself into very restrictive participation opportunities for foreign companies under the so called *buyback*-scheme. The constitution of the Islamic Republic declares all natural resources as public wealth. Therefore, the only possibility for foreign companies to engage in Iran’s energy sector is through so called buyback-contracts, under which private companies develop energy projects without actually owning the reserves identified. The role of private companies is thereby limited to financing and providing technology. This differs substantially from the widely used *production sharing agreements* which normally allow foreign parties to own parts of the reserves and mandate shares in costs and profits from development.⁹⁷

Long before international sanctions restricted foreign investments, the buyback-scheme negatively affected Iran’s ability to export natural gas. Discussions with European companies reveal severe commercial disagreements as professionals complain that the buyback-scheme is a key obstacle to foreign investment due to unattractive rates of return.⁹⁸ However, it is important to note that until the 2010 sanctions, Western companies complained but nevertheless invested in Iran despite the buyback-scheme. Considering that foreign ownership in the Iranian energy sector is not an option, buyback-contracts constitute a second-best alternative.⁹⁹ While not as effective as product sharing agreements, they do not constitute a barrier to investment.¹⁰⁰

3.2.4 Policy and institutional conflicts

In addition to subsidies and objections to foreign interference, Iran’s ability to export natural gas is also substantially affected by various policy and institutional conflicts. The domestic division over how to manage the gas sector is at its peak¹⁰¹ and gas exports face significant obstacles. In the light of high oil prices, it could make economic sense for Iran to increasingly use gas domestically and thereby maintain or increase oil exports. Iranian analysts discuss a variety of domestic uses for natural gas including electricity generation, the expansion of the country’s (petrochemical) industry, the establishment of commercial and residential centres, the use of gas as a fuel for road transportation, or the re-injection into maturing oil fields.¹⁰² In fact, Iran increased the share of gas in the primary energy mix from 15.02% in 1990 to

⁹⁴ Pesaran (2011), 189.

⁹⁵ Hakimian (2011).

⁹⁶ Pesaran (2011), 189.

⁹⁷ Marcel (2006), 42-43.

⁹⁸ Gas Matters (2010, April Issue).

⁹⁹ Hakimian (2011).

¹⁰⁰ Fesharaki (2011).

¹⁰¹ Marcel, (2011).

¹⁰² Ebrahimi (2007), 80.

54.67% in 2011.¹⁰³ It is expected that volumes of gas for re-injection will increase from 26 bcm/y in 2008 to 64 bcm/y in 2015.¹⁰⁴ NIOC put forward ambitious plans to use gas for re-injection aiming at 82-92 bcm/y by 2030, which would equal some eight to nine production phases of the giant South Pars field.¹⁰⁵ Frequent gas shortages during the winter months in Iran's Northern provinces constitute a further obstacle to gas exports. It is politically sensitive to export gas when parts of the population suffer from interruptions in the gas supply,¹⁰⁶ particularly in the light of promises that the Islamic Republic will let the people benefit from the country's energy riches. Considering these and other factors, the national priorities for the use of Iranian gas are defined as *firstly* domestic consumption, *secondly* re-injection into maturing oil fields, and only *thirdly* exporting gas.¹⁰⁷ In terms of quantity, this reflects the current allocation of Iranian gas production. Also in economic terms, it might represent the most profitable use of Iran's gas reserves. The extent to which one can effectively speak of a prioritization or even strategy, however, is questionable in the absence of a clear decision-making and implementation structure and in the face of various institutional conflicts.

The particular type of factionalism inherent in the Iranian political economy translates into institutional conflicts impeding the performance of the Iranian energy sector. A standoff between Parliament and the Ahmadinejad administration is hampering planning in the energy sector. When the president announced the merger of the Ministries of Petroleum and Energy in 2011, Parliament fiercely criticized the president and later reversed his decision.¹⁰⁸ Moreover, there is permanent tension between political institutions and the energy sector. While NIOC and Ministry of Petroleum are traditionally more commercially-oriented, institutions such as the Presidency or Parliament perceive the energy sector as a means to promote their respective political goals. In essence, both sides compete for money and as power is ultimately with the political institutions, money from the energy sector is used to promote political goals at the expense of sound economic policies.¹⁰⁹

As discussed above, Iran insisted on extremely high prices in all negotiations with potential customers. Iranian negotiators fail to achieve the best possible outcomes as they are obsessed with prices and disregard potential political or technological advantages.¹¹⁰ Observers suspect that for many years the underlying problem was not the price itself but domestic Iranian politics including bureaucratic disputes and factional competition. As part of these domestic rivalries, in several negotiations Parliament often relentlessly called for higher prices and accused Ministry and NIOC officials of giving away Iran's gas riches.¹¹¹ This has led to subsequent price renegotiations, often before gas even began to flow, and shown that Iranian gas exports are politicized to a point where "different groups compete to show that they are tougher on foreigners."¹¹² This poses a serious obstacle to gas exports as it provides no basis for long term contracts to be concluded and seriously calls into question Iran's reliability as a trade partner.

¹⁰³ "Iran's Energy Balance 1968-2011," Iran's Energy Efficiency Organisation (IEEO)(SABA); available at: <http://www.saba.org.ir/fa/energyinfo/tashilat/taraz>

¹⁰⁴ Adibi and Fesharaki (2011), 277, 283.

¹⁰⁵ Adibi (2011).

¹⁰⁶ Petroleum Economist, (2010/7).

¹⁰⁷ Kiani and Pourfakhraei (2010), 7765.

¹⁰⁸ France 24 (2011).

¹⁰⁹ Marcel (2011).

¹¹⁰ Marcel (2011).

¹¹¹ Petrossian (2011).

¹¹² Fesharaki (2011).

Apart from these conflicts with institutions outside the energy sector, Iran's energy sector itself is also plagued by institutional problems. Before the revolution, NIOC was solely responsible for the development of Iran's energy sector. After the revolution, the Ministry of Petroleum was founded as a political body to supervise NIOC. In order to guarantee the energy sector operates smoothly, the Minister of Petroleum inevitably installs a loyal managing director as head of NIOC. However, as the tasks of the Ministry and NIOC are insufficiently defined and overlapping, lack of coordination or even diverging agendas complicate the daily business of NIOC whose employees are often required to execute contradictory orders from both NIOC and the Ministry.¹¹³ Talking on the general situation in the country, even president Ahmadinejad admitted: "Currently in our country, it is possible that on one issue two officials make inconsistent decisions".¹¹⁴ Complicating things further, there is an institutional conflict in the gas sector among two NIOC-subsidaries. NIGC (the *National Iranian Gas Company*, which was traditionally in charge of all gas-related activities) allegedly considers the NIGEC (the *National Iranian Gas Export Company*, which was established several years ago in order handle gas exports) as a rival, so that instead of cooperating, both companies compete for responsibilities.¹¹⁵ Adding more confusion, in July 2012 the dissolution of NIGEC and the transfer of its responsibilities to NIOC was announced.¹¹⁶ In September of the same year, however, oil minister Rostam Ghasemi reversed this decision, restoring the status quo ante.¹¹⁷ All this is significantly harming Iranian gas exports as it is essentially questioning Iran's reliability as a trading partner.

¹¹³ Petrossian (2011); Marcel (2006), 102-103.

¹¹⁴ Tabnak (2012), Author's translation.

¹¹⁵ Petrossian (2011).

¹¹⁶ Quds Online (2012).

¹¹⁷ ISNA (2012).

4 Outlook 2025: can past failure become future success?

The final section of the paper discusses the future of Iranian gas exports in an attempt to identify what would be necessary for Iran to become a major exporter. There are two basic conditions: first, Iran would need to create a sufficient gas surplus for export by reducing domestic consumption and/or increasing her marketable production. Second, the government would need to reach agreements – i.e. conclude contracts – with foreign customers.

4.1 *Creating a sufficient export capacity*

As discussed above, Iran not only holds the world's second largest reserves but is also the world's third largest consumer of natural gas. Domestic demand has grown almost simultaneously with production. Subsidies and economic growth have triggered consumption. At the end of 2010, the country embarked on an ambitious subsidy-reform which aims at linking the domestic price for natural gas to a market based formula.

Following the increase in gas prices consumption will certainly be reduced in comparison to previous trends (see Figure 1 and Table 3). This ultimately depends on the full implementation of the subsidy reform, which was halted by Parliament in the face of a power struggle with the government. As president Ahmadinejad will leave office after the elections in June 2013, the implementation of the reform might be continued thereafter. In any case, reduction in demand will only happen over time as consumer behaviour is unlikely to change immediately. In all sectors (households, commercial, industrial) inefficient capital stock cannot be replaced immediately. At the same time, there is some reason to assume that reductions in per capita consumption are likely to be absorbed by additional demand from the economy, which is expected to continue growing. Thus, while energy efficiency is likely to increase and consumption will grow at a slower rate, it is unlikely that Iran's absolute gas consumption will decrease. As shown above, the data available shows that total gas consumption continued to increase after the introduction of the subsidy reform.

Therefore, the key to creating an export capacity for Iran is to increase marketable production at a faster rate than the increase of domestic demand. There is a fair chance this may happen. In only a decade, from 2000 to 2010, Iran increased gas production by an additional 130%.¹¹⁸ Several new South Pars phases are expected to come on stream over the next years adding several dozen bcm to Iran's production.¹¹⁹ Moreover, increasing gas prices can help to also significantly expand the share of marketed production. As prices increase, it is likely to become profitable for Iran to invest in the reduction of flaring, venting, and other losses along the production chain. The fact that Iran did not use¹²⁰ some 37 bcm of gross production in 2011 exposes a significant potential for the creation of an export capacity – at least for the partial recovery of some of the gas not used. Continuing to expand production along with increased efficiency could help Iran to create the necessary surplus for export.

Overall, as demand-side reductions are likely to be modest and there are good reasons to continue expanding the use of gas domestically, the key to creating an export capacity is to

¹¹⁸ Author's calculation based on BP (2012).

¹¹⁹ According to NIGC, Iranian production will reach 190 bcm/y in the Iranian year 1392 (March 2013 to March 2014); Shana (2013, 4 May). Regardless of whether this target will be met, Iranian production is very likely to increase significantly as more and more South Pars phases will come into production.

¹²⁰ I.e. market or re-inject.

both increase production and efficiency so as to make a larger share of the gross production available for the market. Volumes of perhaps 10 bcm/y or so appear to be possible, and these would allow the creation of additional export capacity. However, creating export capacity on the scale of 50 bcm/y is unrealistic in the two decades ahead.

4.2 *Winning contracts*

The existence of an export capacity alone would not be sufficient for Iran to become a major exporter as Tehran would also need to win customers for her natural gas. One of Tehran's major difficulties is to turn its many MoUs into binding contracts. As this paper has shown, this problem stems to a large extent from (internal) political conflicts.

For gas exports at the regional level, it would be sufficient if Iran overcame her domestic struggles in order to facilitate winning gas contracts with foreign partners. Iranian politics would need to refrain from using the country's energy sector as an arena for political infighting and rather consider its long term needs as well as the overall national interest. Chances for this to happen are not as low as one might expect. In the past few years, the conflicts in Iran's political system reached a climax with the rift between Khamenei's conservatives and Ahmadinejad's neo-conservatives hampering Iran's entire political economy. But president Ahmadinejad was effectively weakened in the 2012 parliamentary elections and will leave office after the 2013 presidential elections. It seems likely that he will be succeeded by a conservative candidate loyal to supreme leader Khamenei. Should this be the case, from next year on the conservatives close to Khamenei would not only control the judiciary but also the legislative and the executive branches. This might allow politics to refrain from using the energy sector and the question of gas contracts with foreign countries as an instrument for domestic power struggles. Further, as Iran's revolutionary guards are increasing their control over the energy sector (on the basis of commercial interests), the oil and gas industry became politically stronger in recent years.¹²¹

If all this will result in more rational behaviour with regards to winning contracts for gas exports, i.e. coming to terms regarding pricing, there is a chance for Iran to export more gas at the regional level by 2025 or so. Of all envisaged projects, exports to Pakistan (8 bcm/y) have the greatest chance of materializing in the mid-term as there is a long-term contract defining volumes and pricing as well as a pipeline already built in Iran and another under construction in Pakistan. Second to Pakistan, there is a chance for Iran to realise exports to Iraq (7.3-9.1 bcm/y) by 2025. While security constitutes a serious issue, Tehran's relations with Bagdad are deep. A preliminary contract was signed in February 2013 and pipeline construction is reportedly under way. Together with exports of possibly up to 10 bcm/y to Turkey, 2.3 bcm/y to Armenia, and 0.5 bcm/y to Nakhchivan, this could lead to exports in the range of 20-30 bcm/y by 2025.

At the same time, however, exports to global markets would require fundamental changes in Iranian-Western relations because the European market and LNG export technology are currently out of reach for Iran.

¹²¹ See Yong and Hajihosseini (2013).

4.3 *Summary*

In order for Iran to increase her natural gas exports the country would need to

- implement the subsidy-reform,
- increase production and make a greater share of gross production marketable, and
- rationalize its energy and natural gas sector in order to win export contracts from foreign customers, and refrain from using gas contract negotiations as an arena for domestic political struggles.

Eventually, the country would need to build confidence internationally that it is serious about exporting natural gas. This refers both to the creation of an export capacity as well as the question of contracts. It seems that the only way this credibility can be achieved is for existing and future export contracts to run smoothly over several years.

Iranian gas exports would also benefit from the removal of European and U.S. sanctions. Under the sanctions regime, Iran's access to international finance and Western technology is significantly complicated while potential customers find themselves under pressure from Washington and European governments – as is the case with Pakistan.

Regardless of external obstacles, it is completely unrealistic to expect that Iran will soon reach a 10% share in global gas trade – 70 bcm in 2011 – or even export volumes of more than 100 bcm/y. Before the 2030s, it is also highly unlikely for Iran to become a major exporter as defined in this paper – i.e. to export 50 bcm/y or more. Assuming sufficient increase in production and taking into account the contracts signed as well as the state of pipeline development, it appears rather likely that by 2025 Iran could increase her natural gas exports up to a level of perhaps 20-30 bcm/y in the best case.

5 Conclusions

This paper dealt with the absence of what is almost 16% of the world's proven natural gas reserves from international markets. It examined the reasons for Iran's failure to become a major exporter and assessed whether this situation is likely to change in the years ahead.

With regional and global demand starkly increasing, there are three market regions particularly attractive to Iran: the Arab Middle East, Asia, and Europe. If Iran were to establish herself as a major gas exporter, the supply situation in the international markets would experience significant change. But despite decades-old predictions by Iranians and others the country has not become a substantial exporter of natural gas. The only significant export project, with Turkey, has run far from smoothly with flows being interrupted repeatedly. Trade with Armenia and Azerbaijan is marginal.

Only in the past decade, Iran announced that it aimed for a 10% share of global gas trade and envisaged new projects with a total export volume of 153-158 bcm/y. But despite demand for at least some parts of these volumes, none of the projects have yet materialized.

Against this backdrop, the paper discussed the underlying reasons for Iran's inability to become a major exporter of natural gas. While sanctions might appear as the obvious answer to the puzzle, the paper showed that for most of the period until 2010, they only had a very modest impact. For years, European companies have been actively engaged in the Iranian energy sector. Thus, the central finding of the paper is that domestic factors are crucial to the understanding of Iran's failure to become a major gas exporter.

- The *factionalized political economy* of the Islamic Republic impedes the policy-making process, with factional interests often prevailing over sound long-term policies.
- *Subsidies* held back investments in the energy sector and triggered over-consumption as well as extreme energy inefficiency. Iran's energy intensity is among the worst in the world and partly as a consequence of low gas prices, the difference between gross and marketed production in 2011 was relatively large at 37 bcm or 16%. To the Islamic Republic's credit, Iran embarked on an ambitious subsidy reform. Domestic gas prices are intended to be linked to an export price index. After a first round of significant price increases in December 2010, the implementation of the reform's second phase was blocked by Parliament in November 2012. If fully implemented, the subsidy reform will certainly rationalize gas usage over time but it is unlikely that total domestic consumption will be reduced as Iran's economy is growing and gas is increasingly replacing oil domestically.
- *Objections to foreign participation in the Iranian energy sector* are a further hurdle for Iranian gas exports. In the light of the historically exploitative experience with foreign companies, Iran allows foreigners only to engage in the energy sector under a restrictive buyback-scheme which reduces the role of any foreign company to that of a service provider. Further, companies from abroad and particularly the West are generally met with great suspicion. Before the most recent sanctions, this did not prevent foreign companies from doing business in the Iranian energy sector, but significantly reduced its attractiveness and therefore held back foreign investments.
- Iranian gas exports are also negatively affected by various *policy and institutional conflicts*. There is a fierce debate in Iran as to whether or not the country should export gas at all. The domestic options for gas use include electricity generation and re-injection into oil fields. While gas is increasingly used domestically, the various

institutional conflicts mean that the extent to which one can speak of a definite strategy is unclear. A major rift can be observed between the energy sector and the political institutions with the former being more commercially oriented and the latter more powerful and seeking to exploit the energy sector for political ends. Domestic power struggles politicised gas price negotiations with several Persian Gulf states to the point where negotiations failed, as the Parliament persistently demanded higher prices – contrary to the views of Iranian energy officials. A further complication has been that the responsibilities of the Petroleum Ministry and NIOC as well as those of NIOC and its various subsidiaries are poorly defined, resulting in a lack of coordination and significant inefficiencies.

In its final section the paper examined the chances for Iran to turn her past failure into future success and to become a major exporter of natural gas. For Iranian gas exports to become a reality, Iran would need both sufficient available gas and gas contracts with foreign partners. As domestic consumption is expected to continue increasing – though at a slower rate than previously – the key to export availability is to expand production and to increase efficiency in the upstream sector thereby making a larger share of the gross production available for the market.

To achieve this, Iran would not only have to bring the remaining South Pars phases on stream but also tackle the questions of flaring and gas losses. By increasing domestic gas prices, the country's subsidy reform can play a crucial role in this regard. With the implementation of the reform's second phase currently halted by Parliament, it would be essential for the reduction of flaring to continue with implementation of the reform as soon as possible – in the best case shortly after the presidential elections of June 2013.

In order to conclude international gas contracts, the country would need to stop using negotiations as an arena for domestic political struggles. With the prospect of the conservatives taking over the government in the June 2013 presidential election – in addition to already controlling Parliament and Judiciary – there is at least some potential for this to happen. However, it remains to be seen whether this will ultimately result in a more rational and consistent approach to the gas (and energy) sector. Regardless of this, the European market as well as the latest liquefaction technology will remain out of reach for as long as European and U.S. sanctions are in force.

Overall, based on the analysis in this paper, it can be concluded that Iran could export some more gas by 2025 but will not export in the range of 50 bcm/y before at least the 2030s. It appears possible that in the mid-2020s, Iran might have increased exports to Turkey, Armenia, and Nakhchivan to 10, 2.3 and 0.5 bcm/y respectively, started exporting gas to Pakistan in the range of 8 bcm/y, and possibly even export volumes of 7.3-9.1 bcm/y to Iraq. This would translate to total gas exports in the range of 20-30 bcm/y.

In order for Iran to become a large-scale exporter of natural gas, however, fundamental structural changes would be required on both the international and domestic levels. *Internationally*, sanctions would need to be lifted in order to both integrate Iran in the European and global (LNG) markets and to bring foreign companies back to the country so as to improve upstream development. This would only happen if Iran and the international community – namely the U.S. – were to find a solution to their political standoff. Though both Tehran and Washington signalled their willingness to engage in bilateral negotiations in early 2013, it is impossible to forecast whether and when a breakthrough will be reached. *Domestically*, to substantially improve upstream prospects, Iran would need to create an

investment environment more attractive to international companies. Though there are advantages to the scheme from the Iranian point of view, buyback contracts are significantly less efficient than PSAs for rapidly raising output levels. Officials in Tehran will need to make a decision whether their priority is maximum control over the energy sector or fast increases in production. Beyond this, it would also be necessary to stop factional disputes from intervening in the energy sector and particularly in price negotiations.

Therefore, even if Iran seriously wished to export large volumes of natural gas – which were defined in this paper as 50 bcm/y – and started addressing the international and domestic obstacles to such developments, it will be impossible for Tehran to overcome these problems by the 2020s. Thus, it is certainly not before the 2030s that Iran could at best emerge as a major gas exporter.

6 Appendices

6.1 Iranian gas in figures

	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
Reserves (tcm)	1.8	1.8	1.8	2.3	2.3	2.4	2.8	2.8	2.8	2.8
Production (bcm)	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Consumption (bcm)	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Exports (bcm)	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Imports (bcm)	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Reserves (tcm)	6.1	6.0	6.0	7.6	9.3	9.3	9.3	14.2	14.2	14.1
Production (bcm)	12.9	14.3	16.3	17.8	20.7	20.3	20.0	18.9	16.9	17.9
Consumption (bcm)	9.2	9.7	9.4	10.3	13.0	12.3	12.3	11.0	10.1	12.9
Exports (bcm)	0.9	5.0	7.4	8.1	8.1	9.6	9.3	9.3	7.3	4.4
Imports (bcm)	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
Reserves (tcm)	14.1	14.1	14.1	14.0	14.0	14.0	14.0	13.9	14.2	17.0
Production (bcm)	7.1	6.0	7.2	11.0	13.5	14.6	15.2	16.0	20.0	22.2
Consumption (bcm)	6.9	5.7	7.2	11.0	13.5	14.6	15.2	16.0	20.0	22.2
Exports (bcm)	0.2	n.a.	n.a.	n.a.	n.a.	n.a.	-	-	-	-
Imports (bcm)	-	-	-	-	-	-	-	-	-	-
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Reserves (tcm)	17.0	19.8	20.7	20.7	20.8	19.4	23.0	23.0	24.1	22.4
Production (bcm)	23.2	25.8	25.0	27.1	31.8	35.3	39.0	47.0	50.0	56.4
Consumption (bcm)	22.7	22.7	25.0	26.6	31.8	35.2	38.9	47.1	51.8	58.4
Exports (bcm)	1.5	3.0	-	0.5	-	0.1	0.1	-	-	-
Imports (bcm)	-	-	-	-	-	-	-	0.1	1.8	2.0
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Reserves (tcm)	26.6	26.6	26.7	27.6	27.5	27.6	26.9	28.1	29.6	29.6
Production (bcm)	60.2	66.0	75.0	81.5	84.9	103.5	108.6	11.9	116.3	131.2
Consumption (bcm)	62.9	70.1	79.2	82.9	86.5	105.0	108.7	113.0	119.3	131.4
Exports (bcm)	-	0.1	0.7	3.5	3.6	4.3	5.7	6.2	4.1	5.7
Imports (bcm)	2.7	4.2	4.9	4.9	5.2	5.8	5.8	7.3	7.1	5.8
	2010	2011								
Reserves (tcm)	33.	33.6								
Production (bcm)	146.2	151.8								
Consumption (bcm)	144.6	153.3								
Exports (bcm)	8.4	9.1								
Imports (bcm)	7.2	11.7								

Source: BP (2012) for reserves, production & consumption; OPEC (2012) for exports & imports

6.2 Detailed account of Iran's natural gas production in 2011

	bcm	% of gross production
Gross production	224.1	100
Re-injection	35.4	15.8
Flaring and venting	16.7	7.4
Other losses	20.3	9.1
Marketed production	151.8	67.7

The gross production shows the total amount of natural gas produced while the marketed production represents the amount of gas made available for the domestic and international markets. In 2011, Iran re-injected 35.4 bcm in maturing oil fields in order to keep oil production levels up. 37 bcm of the Iranian gross production were lost because of flaring, venting, and other losses, which is more than the total annual consumption of countries like Australia, Brazil, Poland, or Spain.

Source: Cedigaz (2012)

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