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SHEBERGHAN GAS GENERATION ACTIVITY (SGGA)

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Report on Current State of Natural Gas Sector

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Acronyms and Abbreviations

AEAI	Advanced Engineering Associates International, Inc.
AGE	Afghan Gas Enterprise
BCM	Billion (10^9) Cubic Meter
CM	Cubic Meter
CM/D	Cubic Meter per Day
GIRoA	Government Islamic Republic of Afghanistan
MCM	Thousand Cubic Meters
MM	Million (10^6)
MMCM	Million Cubic Meters
SGDP	Sheberghan Gas Development Project
SGGA	Sheberghan Gas Generation Activity
TCF	Trillion (10^{12}) Cubic Feet
USAID	United States Agency for International Development
USD	United States Dollar
USG	United States Government

1 Executive Summary

The purpose of this report is to create a current reference point for the subsequent estimation of the economic and energy impact on Afghanistan of the Sheberghan Gas Development Project (SGDP) and other relevant gas and power development projects.

Years of war and neglect have left Afghanistan's economy in poor condition. Substantial proven reserves of natural gas exist near the town of Sheberghan northern Afghanistan. Natural gas has been extracted since the 1960's, but the current production rate is only about 5% of the peak historical level. The country now imports almost 70% of its energy needs, so development of natural gas reserves would be very beneficial. Development requires simultaneous efforts in upstream field development and downstream market creation. The Government of Islamic Republic of Afghanistan (GIRoA) proposes to invite the private sector to undertake development of gas fields in Sheberghan and elsewhere.

The GIRoA also expressed keen interest in private sector investment in the power industry. Prior to 1978, Afghanistan was able to access to approximately 396 megawatts (MW) of domestic power compared to approximately 243 MW of power in 2002, at which time almost 50% came from domestic hydropower. In 2004, the Ministry of Energy and Water (MEW) had identified expanded power imports as a key medium-term strategy to address the unmet demand within Afghanistan. The 2007 summer operating capacity of Afghanistan was approximately 750 MW of power. By 2007, about one third of the electrical power delivered to the grid was imported from neighboring countries. Recent improvements in energy transmission and distribution have facilitated significant increases in the imported power, which accounted for 70% of total power supply in 2010. Importantly, while natural gas is a prime fuel source for power generation in many countries, Afghanistan only has one small power plant producing less than 20 MWs associated with the Northern Fertilizer plant.

The development of the Sheberghan gas fields and related infrastructure, including increased electricity generation and transmission, is a shared objective of the USG and GIRoA. To achieve this objective, among other things, the project will produce a "Feasibility Report on Industrial Development of Natural Gas Market in Afghanistan."

The current report is designed to provide a current benchmark for the Afghan gas industry. The main conclusions of this report are:

Gross Domestic Product

- The Afghan economy has recently experienced growth at very high rates, the Gross Domestic Product (GDP) annual rate of growth is nearly 12.3%, however, that rate is applicable to a very low base, a GDP per capita near the US$600 level. This growth was supported by, most important, an increase in the services, and an increase in the agriculture sector.
- The major impact, over the energy sector, of the high Afghan rates of growth is reflected in an increase in the volume of oil derivatives imports. This issue, exacerbated by an increase in international oil prices, has generated a substantial deficit in the international current account balance for the country, because the exports have not grown as expected.
- As indicated, the increase in the economic activity generated an annual rate of growth in the oil derivatives imported volumes, above 35%; and, the imports of those oil products in 2011 represented almost 33% of total imports.

Natural Gas

- Although the Afghan reserves of natural gas are substantial, estimated at 1 TCM by the USGS, the current production of natural gas represents only 5% of that peak output in the 1970's. For the 2011-2012, total reported natural gas production was 160,354 million cubic meter, a small increase (11%) from the 2010-2011, but this is due to a single well rehabilitation and not driven by sustained structural measures.
- In 2011-2012, the total natural gas production was about 160 MCM and the gas consumption by Kodo-Barq-e-Mazar-e-Sharif was 136 MCM. In that sense, more than 85% of production was consumed by the fertilizer and power plant Kodo-Barq-e-Mazar-e-Sharif, the rest of the production is mainly used in the domestic and power generation sectors. The Fertilizer plant's average daily gas consumption over the months between January 2012 and July 2012 was 374 MCM.
- The average AGE's sales price in 1391 (2012-2013) is 1.74 Afs per cubic meter (US$34/MCM). The prices charged by AGE to the main consumers in Sheberghan are to the fertilizer plant and its power generation plant, US$34.8 /MCM; for the domestic users, US$79/MCM.
- Using the methodology and assumptions described above it was estimated that the additional annual growth for GDP from the SGDP, that is, the impact over the total Afghan economy growth of additional natural gas and electricity production due to the Sheberghan Gas Development Project, could be between 0.12% and 0.04%. These results may not seem high, but it is noteworthy that the participation in the total Afghan GDP of both sectors is low, since the increase in the Mining and Quarrying GDP is between 0.9% and 2.8% and in the Electricity, Gas and Water sector between 17% and 218%. Previous results are related with the GDP rate of growth, then, regarding the additional GDP in absolute terms, the additional GDP in 2017-18 reaches the highest value (US$72.7 MM), after which the impact remains constant.

Due to the historically low level of current gas production, from the probable combined gas supply increase from the SGDP project and the contemporaneous rehabilitation of 8 gas wells funded by the Asian Development Bank (ADB), there should be a significant re-invigoration of the gas sector. By implementing the SGDP and ADB projects on commercially viable and sustainable bases, there could be a dramatic turnaround for the gas sector and significant improvements for the Afghan economy. This report establishes the economic and energy starting points while the subsequent deliverable, "Feasibility Report on Industrial Development of Natural Gas Market in Afghanistan", will elaborate on the opportunities and potential impacts of the indicated and additional future projects.

2 Background

Years of war and neglect have left Afghanistan's economy in poor condition. Substantial proven reserves of natural gas exist near the town of Sheberghan in northern Afghanistan. Natural gas has been extracted since the 1960's, but the current production rate is only about 5% of the peak historical level. The country imports almost 70% of its energy needs, so development of natural gas reserves would be very beneficial. Development requires simultaneous efforts in upstream field development and downstream market creation. The Government of Islamic Republic of Afghanistan (GIRoA) proposes to invite the private sector to undertake development of gas fields in Sheberghan and elsewhere.

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The development of the Sheberghan gas fields and related infrastructure, including increased electricity generation and transmission, is a shared objective of the USG and GIRoA. To achieve this objective, among other thing, the project will produce a deliverable:*"Feasibility Report on Industrial Development of Natural Gas Market in Afghanistan."*

In this aspect (according to subsection "e" of Task 1) *"In the context of the anticipated considerable gas resource (about 1 TCM) present in the Amu Darya basin in northern Afghanistan, other uses of natural gas need to be assessed, to identify correct priority uses of natural gas. The Contractor must therefore prepare a feasibility report addressing the following gas market issues:*

1. Definition and analysis of the current natural gas supply and demand situation focusing on northern Afghanistan, except when/where bottled gas products (CNG) are involved. The report must identify:
    a. Size of supply and demand, construct energy matrix
    b. Unmet demand
    c. Market segmentation
    d. Constraints within the current market
    e. Transportation
    f. Pricing, also regional price analysis.
    g. Energy imports, segmented by product
2. Preconditions to expanded demand, such as:
    a. Competitive gas pricing
    b. Gas transportation systems [pipelines, bottled gas, etc.]
3. Priority uses of natural gas based on value added and overall economic benefit, ranking at a minimum the following end uses:
    a. Fertilizer production
    b. Power generation

c. Commercial uses (e.g. glass and glassware production, ceramics, brick making, and other large scale industrial production processes, transportation fuel [CNG])
d. Residential use (cooking and heating)
e. Gas exports
f. LNG

4. Conceptual roadmap for the development of gas utilization, including those uses listed above".

In this context, the first step of the Feasibility Study requested is the generation of the Report on Current State of Natural Gas Sector. Before looking at the Afghanistan gas sector in detail, it is helpful to create a context, so the following sections will initially review the gas sector situation in relevant Central and South Asian region countries. Thereafter, there is an examination of the Afghan economy and the impact of a natural gas substitute, petroleum, on the economy. Finally, the Afghan gas market is examined with the foregoing perspectives.

3 Regional Natural Gas Markets

In this section are presented some main features about the natural gas markets in countries of the region, in particular, China, India, Iran, Pakistan, Tajikistan, Turkmenistan and Uzbekistan. The main objective is providing a view of the net export/import situation of each country regarding the internal natural gas production and consumption. The main sources of data are the US Energy Information Administration and the British Petroleum Statistics.

3.1 Production

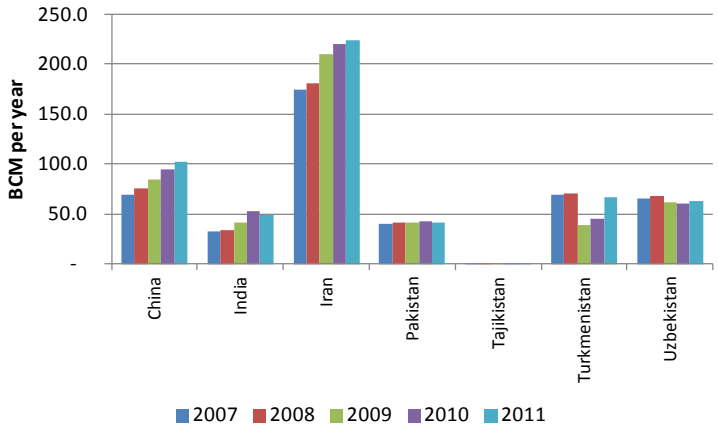
Table 1 presents the total production of the selected countries for 2007-2011, and Figure 1 shows the evolution of the production for each country. It's clear that Iran and China are the main producers, for example, in 2011 these countries reached a production of 641 MMCM/D and 282 MMCM/D, respectively, and those two countries also had high annual rates of growth, especially China. Also, it is important to note the decline in the production of gas by Turkmenistan during years 2009-2010, as a result of a pipeline explosion and a soured relationship with Russia and Gazprom that was subsequently corrected. Another country with high production and low growth is Pakistan; it can be observed that in this period that the production was stable in 115 MMCM/D.

Table 1: Regional Natural Gas Production (BCM/year)

Country	2007	2008	2009	2010	2011	Annual Growth
China	69.3	76.0	84.2	94.4	102.8	10.4%
India	32.3	33.1	41.7	53.3	48.6	10.7%
Iran	174.2	180.4	210.3	220.1	224.1	6.5%
Pakistan	40.0	41.1	41.8	42.8	41.7	1.0%
Tajikistan	0.02	0.03	0.04	0.04	0.02	-1.3%
Turkmenistan	68.9	70.5	38.2	45.3	66.2	-1.0%
Uzbekistan	65.2	67.6	61.4	60.1	63.0	-0.8%

Source: US Energy Information Administration, BP

Figure 1: Natural Gas Production by Country (BCM/year)



3.2 Consumption

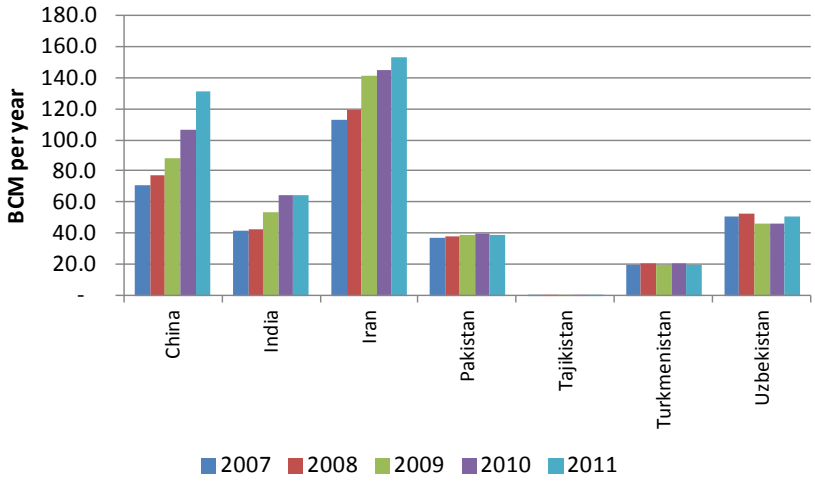
The consumption of natural gas in presented in Table 2 and Figure 2, as in the production analysis, the data are expressed in BCM per year. It's clear that for most of the countries the consumption annual rate of growth is bigger than the production growth. This situation is very clear in the case of China, in 2007 the consumption and production were very similar, but in 2011 the consumption was 30% higher than the total production, so the imports needs of this country were high, which is a situation also present in India. On the other hand, Pakistan seems to have limited the internal consumption due to some production restrictions. In the case of Turkmenistan, the increase in the production of 2011 didn't occur because of a bigger internal demand, rather, it was due to improved relations with Russia and Gazprom for an increase in the gas exports in that year.

Table 2: Regional Natural Gas Consumption (BCM/year)

Country	2007	2008	2009	2010	2011	Annual Growth
China	70.5	77.2	88.5	106.7	130.9	16.7%
India	41.4	42.9	53.3	64.5	64.0	11.5%
Iran	113.0	119.3	141.4	144.6	153.3	7.9%
Pakistan	36.8	38.0	38.7	39.6	39.2	1.6%
Tajikistan	0.7	0.4	0.2	0.2	0.2	-25.9%
Turkmenistan	19.5	21.0	20.1	20.4	20.1	0.8%
Uzbekistan	50.5	52.6	46.2	45.7	51.0	0.3%

Source: US Energy Information Administration, BP

Figure 2: Natural Gas Consumption by Country (BCM/year)



3.3 International Trade

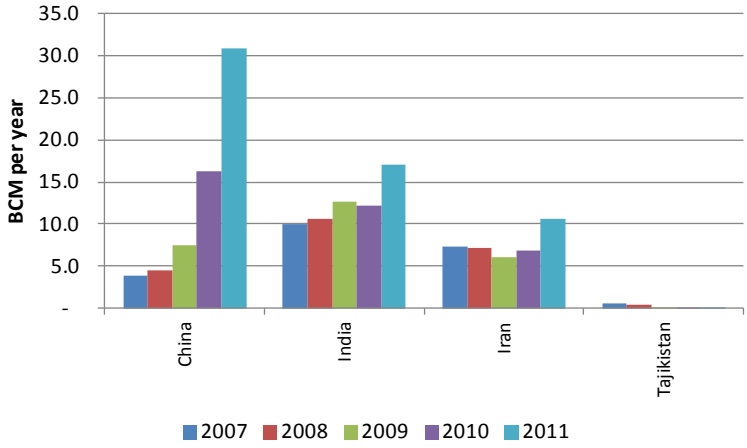
Regarding the importation of gas, Table 3 and Figure 3 present the behavior of the gas importing countries in the region: China, India, Iran and Tajikistan. It is evident that the internal needs of natural gas in China and India were solved with an increase of imports, in particular, China showed an annual rate of growth equals to 67.5%, what results in an increment of natural gas imports from 3.9 BCM in 2007 to 30.9 BCM in 2011; almost 50% of this imports came from Turkmenistan (see Table 5) and the rest from LNG projects (Australia 29.8%, Qatar 19.1%, Indonesia 16.4%, Malaysia 12.8%, Yemen 6.6%, Nigeria 5.9% between the important sources). On the other side, the 100% imports of India are from LNG projects (Qatar 76%, Nigeria 7.9%, Trinidad & Tobago 3.3%, USA 2.5% and the others). Finally, the 96% of the imports of Iran are from Turkmenistan and the rest from Azerbaijan. Iran plans to build a pipeline to increase natural gas supplies to its northern provinces and cut reliance on imports from Turkmenistan. Iran has the second highest gas reserves in the world but must import gas to supply the Mazandaran province, bordering the Caspian Sea. Iran plans to complete a 160-kilometer (99-mile) link, which will carry gas from its Semnan province to Mazandaran province, in two years.

Table 3: Regional Natural Gas Imports (BCM/year)

Country	2007	2008	2009	2010	2011	Annual Growth
China	3.9	4.5	7.5	16.3	30.9	67.5%
India	10.0	10.7	12.6	12.2	17.1	14.4%
Iran	7.3	7.1	6.1	6.9	10.6	9.7%
Tajikistan	0.6	0.4	0.2	0.2	0.2	-27.2%

Source: US Energy Information Administration, BP

Figure 3: Natural Gas Imports by Country (BCM/year)



Regarding exports, Table 4 and Figure 4 present the main exporting countries in the region. It's clear that the access to the Russian and Chinese markets increased the Turkmen exports from 6.2 BCM in 2007 to 34.6 BCM by 2011 (Figure 5) converting Turkmenistan in a major natural gas exporting country in the region. In the second place we found Iran and Uzbekistan with a similar export volume (9 BCM per year) but different pathways, meanwhile Iranian exports increased from 6.2 in 2007 to 9.1 in 2011 (due to the strong market in Turkey) while the exports of Uzbekistan declined by over 37% in the same period, since the main market for this country's gas is Russia, see Table 5, apparently based on Turkmenistan's increased exports to Russia.

Table 4: Regional Natural Gas Exports (BCM/year)

Country	2007	2008	2009	2010	2011	Annual Growth
China	2.7	3.4	3.2	4.0	3.1	3.2%
Iran	6.2	4.1	5.9	8.4	9.1	10.1%
Turkmenistan	6.1	6.5	16.7	19.7	34.6	54.3%
Uzbekistan	14.7	15.0	15.7	13.6	9.2	-11.1%

Source: US Energy Information Administration, BP

Figure 4: Natural Gas Exports by Country (BCM/year)

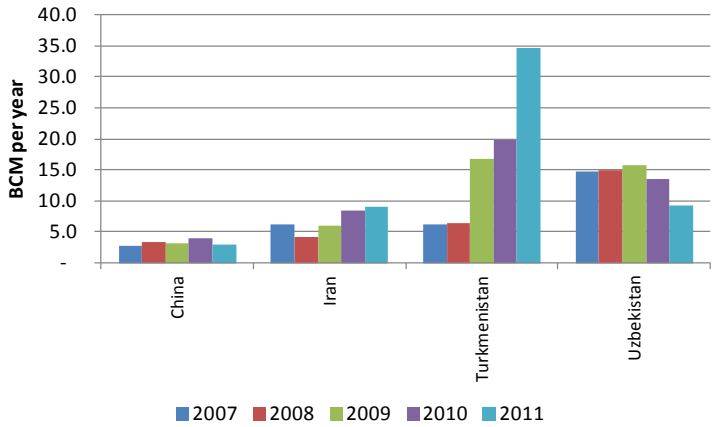
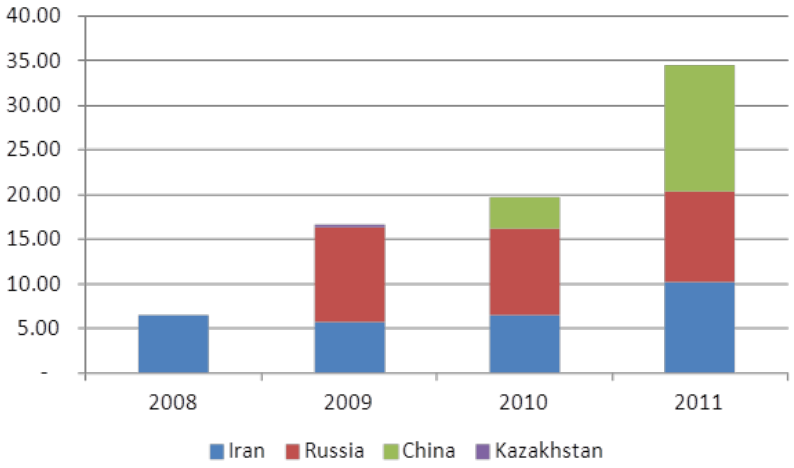


Table 5: Regional Natural Gas Imports and Exports 2011 (BCM/year)

Country	China		India		Iran		Tajikistan		Turkmenistan		Uzbekistan	
	Imports from	Exports to	Imports from	Exports to	Imports from	Exports to	Imports from	Exports to	Imports from	Exports to	Imports from	Exports to
Armenia	-	-	-	-	-	0.5	-	-	-	-	-	-
Azerbaijan	-	-	-	-	0.4	0.3	-	-	-	-	-	-
China	-	-	-	-	-	-	-	-	-	14.3	-	-
Hong Kong	-	3.1	-	-	-	-	-	-	-	-	-	-
Iran	-	-	-	-	-	-	-	-	-	10.2	-	-
Kazakhstan	-	-	-	-	-	-	-	-	-	-	-	1.7
Kyrgyzstan	-	-	-	-	-	-	-	-	-	-	-	0.2
LNG	16.6	-	17.1	-	-	-	-	-	-	-	-	-
Russia	-	-	-	-	-	-	-	-	-	10.1	-	7.1
Tajikistan	-	-	-	-	-	-	-	-	-	-	-	0.2
Turkey	-	-	-	-	-	8.4	-	-	-	-	-	-
Turkmenistan	14.3	-	-	-	10.2	-	-	-	-	-	-	-
Uzbekistan	-	-	-	-	-	-	0.2	-	-	-	-	-
Total	**30.9**	**3.1**	**17.1**	**-**	**10.6**	**9.1**	**0.2**	**-**	**-**	**34.6**	**-**	**9.2**

Source: BP

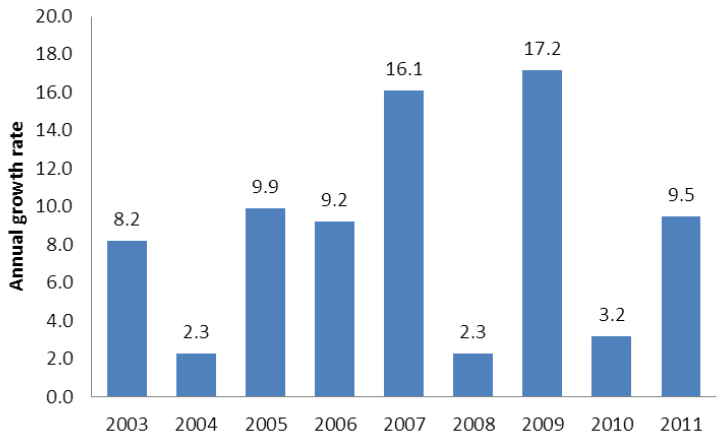
Figure 5: Turkmenistan Natural Gas Exports (BCM/year)



4 Afghan Economy

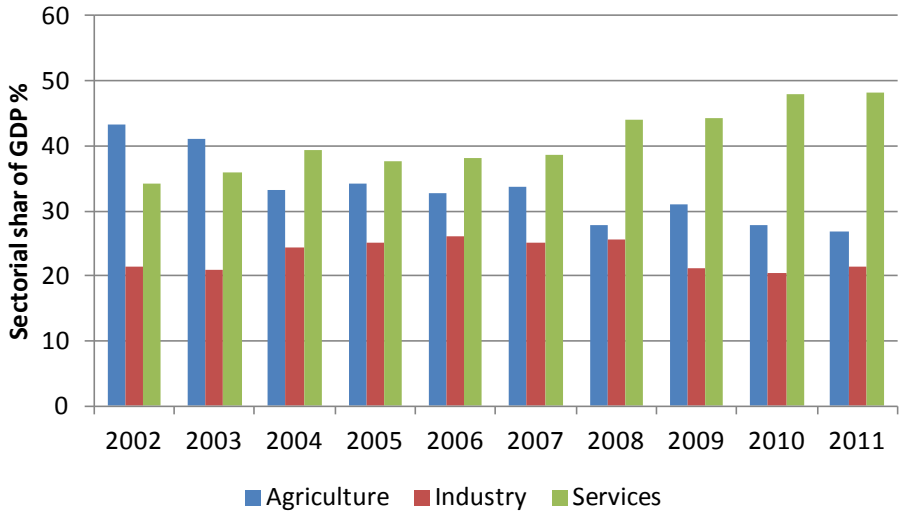
After 11 years of civil conflict, the Afghan economy has found the path of economic development (see the figure below). One example is the high GDP growth in 2011, about 9.5%. The reconstruction phase has stimulated investment, for that reason the main growth sectors are construction, transport, telecommunications, energy and health. International financial assistance has worked as an economic engine to cause the economic expansion, thus, the demand for products and services has increased.

Figure 6: Afghan Annual Rate of Growth



All sectors of the economy have participated in development and important economic progress has been accomplished. Although Afghan economy was primarily based on agriculture, industry and services, the behavior of these areas as shown in the graphics below are not correlated. Also, importantly, the services sector (telecommunication, transport, education, health) has increased their participation while the agriculture sector has diminished on a comparable basis in the last 10 years.

Figure 7: Important Sectors in Afghan Economy



Nevertheless, the recovery of the last few years seems to be strong to moderate, as the World Bank point out in the Afghanistan Economic Update of October 2011:

"Afghanistan's economy is growing strongly. The growth drivers in recent years have been above average agricultural production, strong growth in construction and transportation, and security spending enabled by large aid flows, especially in FY2009/10. Real GDP growth reached 8.4 percent in FY2010/11."

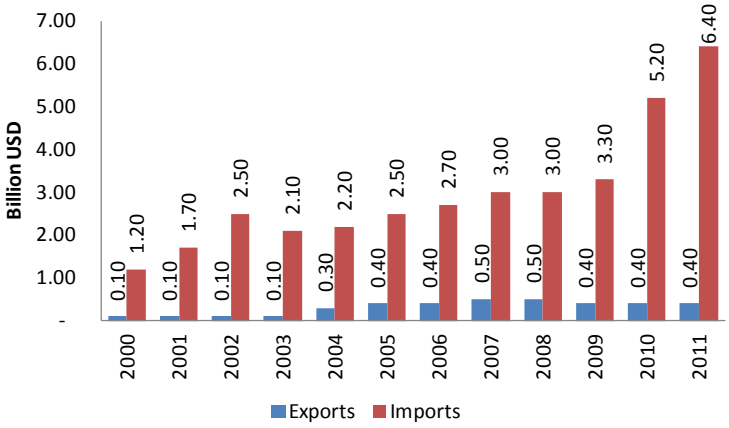
"Afghanistan's fiscal position is strengthening. In the last three years revenues grew by an average of 34 percent p.a., thanks to improvements in customs and tax administration. Larger increases are expected once mining operations begin in Aynak and Hajigak and with the introduction of a value-added tax in FY2014/15. However, government expenditures will also increase in the coming years due to higher security spending, the roll out of pay-and-grading reforms for the civil service, rising recurrent obligations from large donor-supported projects (including those financed outside of the core budget) and the fiscal costs of the Kabul Bank bailout."

"The country moved from sharp deflation to double-digit inflation in one year. The strong inflation trend is mainly explained by an increase for prices in food, electricity and fuels and reflect international price trends, disruptions in trade flows with Iran and Pakistan over the past year as well as a bad harvest in the 2Q of 2011 which limits the possibilities for food import substitution by households."

"Medium-term prospects are moderately good and will depend on the Government's ability to successfully manage the transfer of security control from international to national forces, and ensure political stability and fiscal sustainability. Long-term growth prospects will depend on the extent to which mining can be used to foster development in agriculture and services, which are crucial to food security, employment and poverty-reduction, and export revenue."

The Afghan economy is characterized by its high degree of imports. The import growth rate is much higher than the growth rate of exports. The weakness of production structure is the main factor, which is obvious from deficit balance in 2011 of around US$6.4 billion. As shown in the following figure, the imports are too much higher than the exports, with a substantial increase in the last two years, 2010 and 2011.

Figure 8: Imports and Exports in the Afghan Economy



A brief resume of the Afghan economy can be found in the following table, where the following observations can be made: a) there was a great increase in the GDP per capita; b) there was a high dependency of the imports; c) there was a high impact of the oil imports within the total imports, for

example, in year 2011 it was 32.9%;[1] d) the increase in the imports (mainly oil) generated an increase in the deficit of the international account balance; and e) the export sector growth was modest.

Table 6: Key Indicators of the Afghan Economy

Concept	Unit	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
GDP Growth	%	N/A	N/A	N/A	8.2	2.3	9.9	9.2	16.1	2.3	17.2	3.2	9.5
GDP	MM USD	N/A	N/A	4,523.0	4,917.0	5,619.0	6,633.0	7,533.0	10,431.0	10,641.0	12,871.0	16,343.0	18,952.0
GDP per capita	USD	N/A	N/A	207.0	221.0	242.0	281.0	313.0	426.0	426.0	505.0	629.0	715.0
Population	Million	N/A	N/A	21.8	22.2	23.2	23.6	24.1	24.5	25.0	25.5	26.0	26.5
Exports	MM USD	137.0	68.0	100.0	144.0	305.0	384.0	416.0	454.0	545.0	403.0	388.0	376.0
Imports	MM USD	1,176.0	1,696.0	2,452.0	2,101.0	2,177.0	2,471.0	2,744.0	3,022.0	3,020.0	3,336.0	5,154.0	6,390.0
Deficit/Surplus	MM USD	(1,039.0)	(1,628.0)	(2,352.0)	(1,957.0)	(1,872.0)	(2,087.0)	(2,328.0)	(2,568.0)	(2,475.0)	(2,933.0)	(4,766.0)	(6,014.0)
Exports	% GDP	N/A	N/A	2.2	2.9	5.4	5.8	5.5	4.4	5.1	3.1	2.4	2.0
Imports	% GDP	N/A	N/A	54.2	42.7	38.7	37.3	36.4	29.0	28.4	25.9	31.5	33.7
Oil imports	MM USD	N/A	N/A	14.3	41.2	14.6	90.6	83.4	142.0	547.0	740.0	999.0	2,103.0
Oil imports	% Deficit of trad balance			0.6	2.1	0.8	4.3	3.6	5.5	22.1	25.2	21.0	35.0
Oil imports	% Total Imports	N/A	N/A	0.6	2.0	0.7	3.7	3.0	4.7	18.1	22.2	19.4	32.9

Source: Central Statistics Organization

5 Brief description of the hydrocarbons sector in Afghanistan

Driven by imported oil utilization, the hydrocarbons sector was one the growing sectors during the 10 past years, indeed, despite utilization of traditional fuels such as firewood, animal dung, charcoal, hydropower for cooking and heating, there is heavy reliance on the hydrocarbons sector to satisfy energy needs, which is likely going to become progressively important particularly in the urban areas. This section focuses on the supply, demand and price evolution of the most hydrocarbons used in Afghanistan. First, the structure of market is examined and then the importation of gasoline, diesel and LPG, which dominate market. Secondly, the demand for the sector is analyzed and then finally, the price behavior is revealed.

5.1 Supply

The absence of significant internal production and the high growth of hydrocarbon imports, some market restrictions[2] and low quality of oil are the main features of the Afghan market. There is currently very little domestic production of crude petroleum products in Afghanistan. Some reserves of oil were discovered in the country in the late 1960s. In fact, an oil field, Angot in Sar-e-pul, was developed, but oil production was intermittent, with daily outputs averaging 500 barrels per day or less. This field continues to produce small quantities of crude oil, and primitive means are used to refine the oil produced at the field in Sar-e-Pul.

At this time the government had the monopoly on the petroleum products imports and the price regulation. In1991, in order to boost supply, the privatization of the fuel trade was announced but did not prevent shortage of fuel. The State's political collapse in 1992 put in place a real and "natural deregulation" and liberalization of the petroleum market.

An oligopolistic structure of market is the second feature of hydrocarbon market in Afghanistan. Even though there is not presently a vertical structure of the hydrocarbon market it is evaluated on that basis in this report. In fact, while it is possible to have a small or medium pump station, the importing of large quantities of fuel requires significant capital and is too difficult for modest size companies. Thus, the number of supplier due to barriers to entries reduced and the market is dominated by medium and large players with comfortable margins versus negligible margins for small participants. Competition between

[1] One explanation can be found in the increase of the international oil prices observed in the last years.
[2] Generally associated with low competition inside the supply.

the market players is not fierce, since there is sufficient demand for all of them. Many of these companies also trade in LPG. The main importers are Gas Group, Ghazanfar Group, Azizi Hotak Group, Dawi Oil, and SunGas. Foreign companies like the American company, Tryco, have provided petrol, diesel and aviation fuel to government departments, Coalition Forces, international organizations, some airlines, and other large customers.

The imports of gasoline, diesel, LPG, are presented in the following table. It can be observed, that the energy share for diesel represents nearly 50%, followed by gasoline (37%) and LPG (13%). Between 2003 and 2011, the mean growth rate oil import was very high. In 2011-2012, Afghanistan spent US$2.1 billion for its energy imports. The deficit of the trade balance was US$6 billion and the share of energies in the deficit was 35%.

Table 7: Petroleum Imports

	Unit	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012
LPG	000 Tons	1.8	49.6	86.4	94.3	73.3	110.4	88.0	122.2	174.1	226.3
Gasoline	000 Tons	93.0	103.3	147.6	192.5	157.6	114.5	95.0	157.0	572.4	614.1
Diesel	000 Tons	134.6	325.1	269.2	241.4	320.0	361.2	215.3	356.1	679.8	1,118.1
Total	000 Tons	**229.3**	**478.0**	**503.1**	**528.1**	**550.9**	**586.1**	**398.4**	**635.2**	**1,426.3**	**1,958.5**

Source: Ministry of Commerce, Petroleum products and liquid Gas Enterprise

Geographic repartition of trade is very large relative 60s and 70s when the Soviet Union accounted for some 80% of Afghanistan's petroleum products imports. Today, due to liberalization of commerce, many countries have involved in this industry. Nearly all petroleum products are imported from neighboring countries, mainly Turkmenistan plus Uzbekistan, Russia and Kazakhstan, see the following table. All transport of bulk imported supply is by road tanker; there is no functioning rail transport. Fuel is imported into Afghanistan via Haqina, Torgundi and Hairatan in the north, Islam Qala and Zaranj in the west and Tortham and Spinboldak in the south and east.

Table 8: Oil derivatives imports by Country

Country	LPG		PETROL		DIESEL		TOTAL	
	Quantity (000 Tons)	Value (000 US)	Quantity (000 Tons)	Value (000 US)	Quantity (000 Tons)	Value (000 US)	Quantity (000 Tons)	Value (000 US)
Azairbaijan	-	-	10	6,244	0	218	11	6,462
China	1	512	-	-	-	-	1	512
Iran	1	364	24	15,262	75	45,528	100	61,154
Latvia	-	-	14	9,149	-	-	14	9,149
Kazakhstan	37	14,611	43	26,938	33	20,938	113	62,487
Pakistan	0	1	12	7,572	56	34,534	69	42,107
Russia	5	2,034	68	42,206	212	127,478	284	171,718
Saudia Arabia	0	15	-	-	0	103	0	118
Tajikistan	0	56	57	35,993	33	20,315	90	56,365
United Arab Emirates	0	41	-	-	0	130	0	171
Turkey	0	142	-	-	-	-	0	142
Turkmenistan	127	50,912	210	129,494	157	94,863	495	275,269
Uzbekistan	34	13,443	132	82,059	181	109,994	346	205,495
Total	**205**	**82,130**	**569**	**354,917**	**749**	**454,100**	**1,523**	**891,147**

Source: Central Statistics Organization

The quality of hydrocarbon products is a big issue in Afghanistan because oil supply in the market has low quality. There are some pump stations supplying acceptable oil, but the market is dominated by low quality products. Some measures were undertaken to reduce demand, for example, the interdiction of car imports aged more ten years or the week-end day's extension to reduce vehicular traffic. Individual initiatives like car operating on working with oil and gasoline or only with gasoline in Jalalabad is starting, but remains modest.

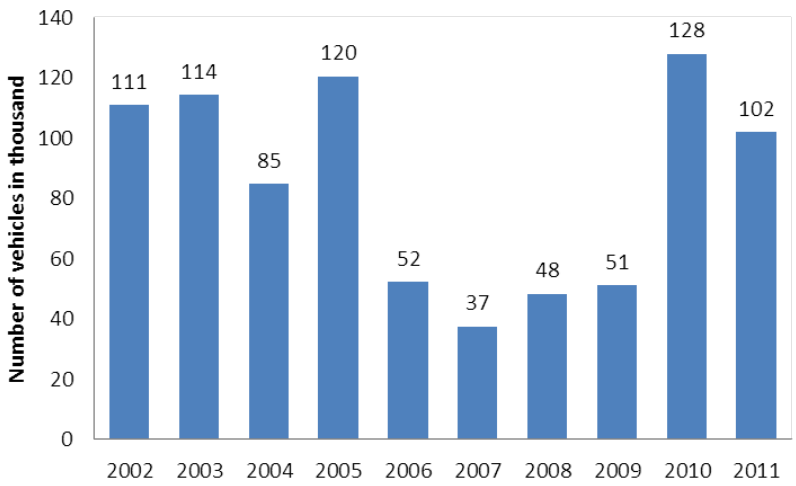
5.2 Demand

Demand for energy in Afghanistan follows the general trend observed in developing countries with some particularities. In most developing countries, energy consumption is likely to increase dramatically, due to the improvement of living standards, population growth, rapid urbanization and the gradual substitution of commercial energy for non-commercial sources. Traditionally, demand for hydrocarbons products was never very high due to weakness of economic development of the country, but during the three past decades, two factors have boosted the demand: military demand during the 1980s' and GDP growth.

Three issues influence hydrocarbons demand: residential (especially for cooking and heating, power generator), transportation and commercial/industrial. In Afghanistan, the demand of for the three elements is growing, usually associated with rising GDP, despite the oil price increase. Residential and commercial/industrial demand is growing, in particular, in urban area.

Currently, diesel is used for civil and military transportation and for electricity production uses and we can observe that diesel demand is high than gasoline. For the greater fuel efficiency, diesel vehicles are generally preferred over gasoline. Most Afghan vehicles, including passenger cars, have diesel engines and, as shown in the following figures, following the major economic activity of the last few years, there was an increase in the number of the vehicle imports while the oil derivatives imports also increased.

Figure 9: Imported Vehicles in Afghanistan

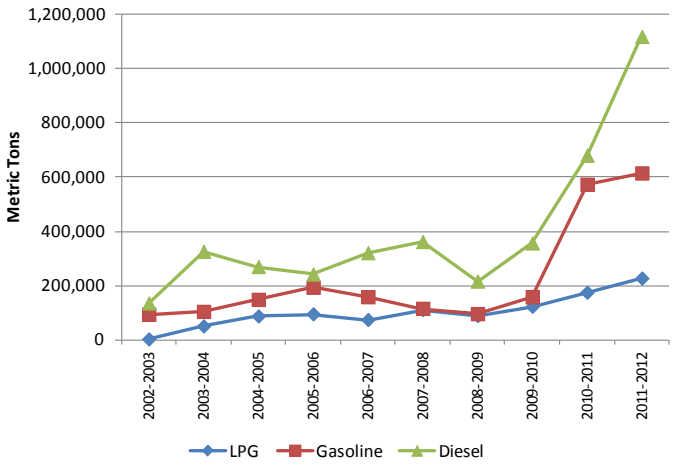


Demand for transportation is most significantly affected by military demand. So the reduction of that demand is expected in the future and would lead to a notable decline in total demand. Demand variation depends on various factors, such structure of the market, existence of substitute products, nature of product, etc. However, the main factor is the future evolution of GDP growth. If economic growth continues on the same path as in the past, the demand will increase. Otherwise, the demand will adjust, at least in short term, as was apparent before 2001.

Several factors facilitated LPG's demographic growth, i.e. growth of demand; growth of income; lack of other kinds of suitable energy; urbanization; transport facilities, especially in area with difficult access; simplicity of use; regulatory measures imposed on the commercial and light industries sector; and its relative cheaper price than wood for urban households.

There was not significant information about LPG consumption for all sectors for a thorough assessment. Some studies estimated consumption of LPG at 67,000 tons in 2009-2010. In that sense, it was assumed that all imported hydrocarbons were consumed domestically and there was no re-export. The relevant statistics are presented in the following figure 10.

Figure 10: Oil derivatives demand in Afghanistan



Although demand for all hydrocarbon products is growing, growth of demand for LPG is regular and less impacted by economic and others phenomena.[3] That means this demand is more inelastic. In 2011-2012, the value of imports of hydrocarbons (petrol, diesel, LPG) was US$891 million. For imports of these three products, the share of diesel represents nearly 50% followed by gasoline (37%) and LPG (13%). And in 2011-2012, Afghanistan has spent over 2 billion USD for its energy imports. The deficit of the trade balance was 6 billion USD and the share of energies in the deterioration of the deficit is 35%.

5.3 Prices

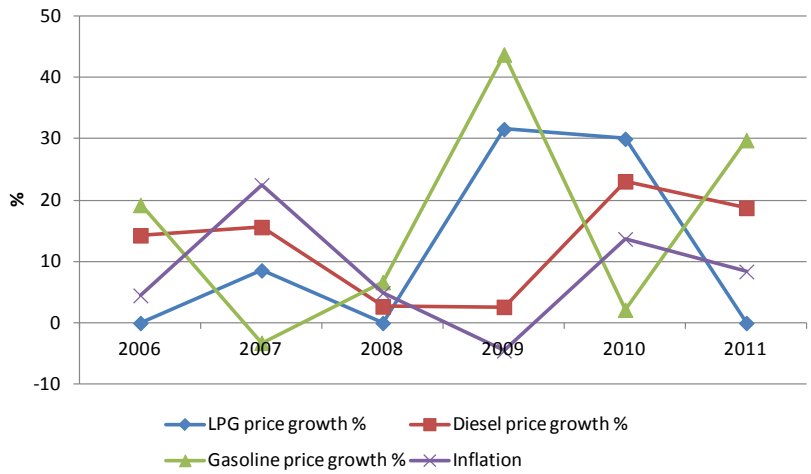
Before 1991, the government had a monopoly on the trade of petroleum products; the objective was to establish strategic reserves to protect the country against shortages and price fluctuations. The end of the old regime led to the disappearance of the monopoly and the organization in charge of this activity in the Ministry of Commerce became the Department of General Petroleum Product. This organization still influences pump stations to provide petroleum products at slightly lower prices, but no longer has the monopoly. There was lower degree of pass-through, when Afghan government used oil price subsidies. Now, fuel prices are nearly completely deregulated and the difference between the government and open market prices is not significant.

Fuel market prices as a good economic indicator should resume and reflect information about supply and demand. In Afghanistan, economic and non-economic reasons influence hydrocarbons prices. International price fluctuations cost of transportation, climate, taxes and market structure, income, and price elasticity are main economic factors impacting prices.

[3] In 2012-213 household LPG consumption is between 15-20 Kg per month. Average price is 55 Afg (1.07 USD). So share of household income (GDP per capita) spent on LPG would be 3% (22 USD).

Afghanistan is a net importer of hydrocarbon products so international price variations have an important impact on domestic fuel prices. So, there is imported inflation combined with domestic inflation that has a significant impact upon livelihoods and economic growth, as illustrated in the following figure.

Figure 11: Growth of Oil Derivative Prices and Inflation



As shown above, the national inflation rate and the growth of LPG and diesel prices follow the same path. There is a positive correlation between the national inflation rate and diesel, whereas the correlation between inflation rate and growth of gasoline prices is negative. Current price (as of January 2013) of LPG, gasoline and diesel are 64 Afs (US$1.25), 56 Afs (US$1.11) and 62 Afs, respectively, near to international prices, but high-quality gasoline (Super 95) is sold at a higher price per liter.

Even the pass-through effects from international to domestic energy prices are significant in country like Afghanistan; however, relatively contained inflation rates suggest that overvalued rate of the Afghani relative to US dollar and neighboring countries currencies seems to have limited the impact of fuel prices on the overall price level.

The demand for oil products in developing countries like Afghanistan does not decrease due to elasticity effects. Demand for oil products remain the same even with prices increases, i.e. demand is inelastic regarding fuel prices. Income elasticity of demand seems to be over 1. The combination of both elasticity and income increase the demand for hydrocarbons products. However, increases of GDP and GDP per person are the main contributors to the demand developing in ten past years.

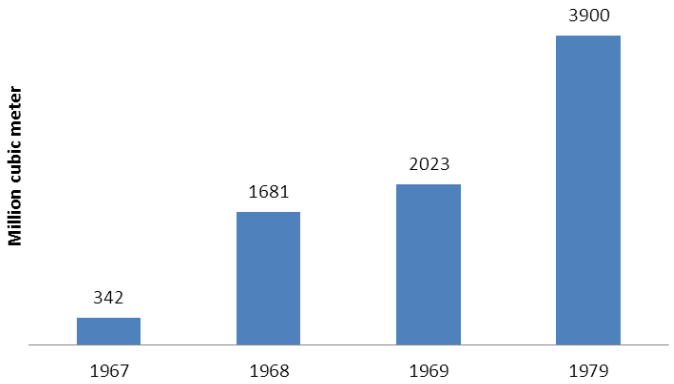
6 The Natural Gas Market

From the late 1960 until the 1980's, natural gas production was an active and dynamic field of the Afghan economy. After exploration, during the Soviet technical assistance, production started modestly during the1960s and it was increasing and achieved its peak level in the end of 1970's. The decade of the 1980's was the beginning of the economic and political disturbances that destroyed Afghan economy. The natural gas field as other sectors of economy suffered dramatically. This negative impact had severe consequences on the Afghan economy since the natural gas industry was one of the most important sources of foreign exchange to finance Afghanistan's economic development.

6.1 Production

Development of the natural gas industry was one of the priorities of Afghanistan, in fact, gas was included in the second plan in 1957 in order to support economic growth of the country and create an economic pole of development. The production in 1979 was ten times more than the beginning level of exploitation, as shown in the figures below.

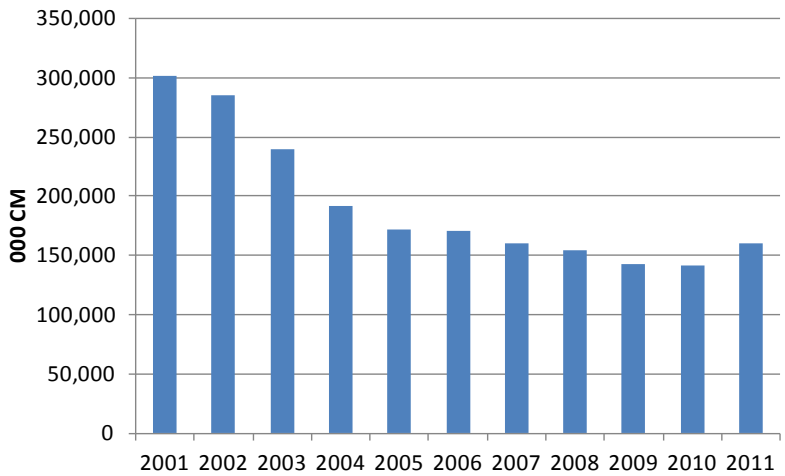
Figure 12: Previous Natural Gas Production



Many exploration missions were conducted and the production started modestly in the 1960's before reaching its peak in the 1970's. Today, the total production comes from the northern regions, principally the Sheberghan capital of Jawzjan. There are about 24 active natural gas wells in Sheberghan and the gas supply is brought to residential and commercial sector in Sheberghan and to Kodo-Barq-e-Mazar Sharif by pipelines that moves the gas from producing and storage areas

Although the reserves of natural gas (proved and probable) are important, the current production of natural gas represents only 5% of that of 1970's. For the 2011-2012 period, total reported natural gas production was 160.354 BCM , a small increase (11%) from the 2010-2011, but this is due to one rehabilitated well and not driven by sustained structural measures.

Figure 13: Natural Gas Production



6.2 Demand

The nature and level of demand goods and services are based on several factors, including the population growth, the number of people per household, the preferences of population for different form of energy, national priorities in terms of development of certain industries or economic sectors, the penetration of new technologies or forms of energy in the market, etc.

Internal demand for natural gas was and is restricted, indeed from the beginning, demand from former USSR and from domestic industrial sector supported the Afghan natural gas industry. While the delivery of the gas to residential and commercial sectors was a third component, a considerable share of natural gas was exported due to the economic and political considerations to the former Soviet Union, who bought at the under assessed prices. While planned objective was not reached, exports of natural gas were a key compound of trade balance, without which the trade balance would have been more negative, as shown in the table below.

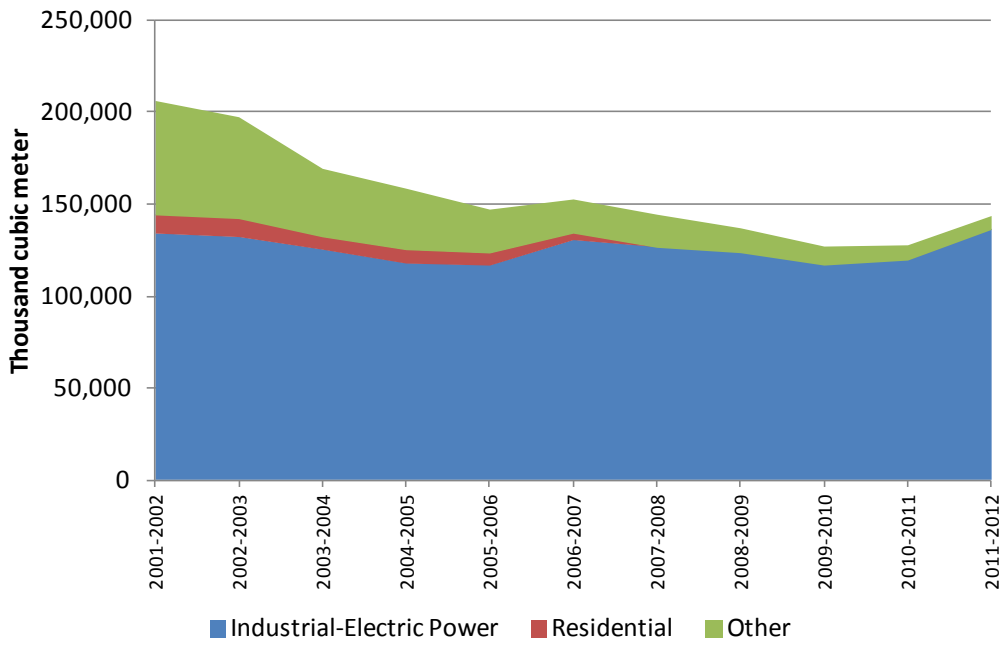
Table 9: Past Natural Gas Exports

	Unit	1967-1968	1968-1969	1969-1970	1970-1971	1971-1972	1972-1973	1973-1974	1974-1975	1975-1976 Estimation
	Million USD	66.4	71.8	81.7	85.1	99.7	124.5	159.1	230.6	235.5
Total imports	Million USD	138.4	124.4	124.8	110.8	153.2	157	182.9	242.5	277.5
Solde	Million USD	-72	-52.6	-43.1	-25.7	-53.5	-32.5	-23.8	-11.9	-42
Natural gas exports	Million USD	2.9	9	12.1	14	14.5	17.1	18	32.1	46.3
Solde without natural gas expots	Million USD	-74.9	-61.6	-55.2	-39.7	-68	-49.6	-41.8	-44	-88.3
Natural gas exports as % of total export	%	4.37	12.53	14.81	16.45	14.54	13.73	11.31	13.92	19.66

Source CSO, Da Afghanistan Bank

The cessation of exports of natural gas since 1991 and poor conditions of the gas infrastructure have worsened the Afghan economic situation. At the present, the lack of supply has restricted demand. Among of three components of current demand, only the demand from the fertilizer and power plant, Kodo-Barq-e-Mazar-e-Sharif, plays a critical role since current demand from residents and the commercial sector is small, as shown in the graphics below.

Figure 14: Natural Gas Consumption by Sector



In 2011-2012, the total natural gas daily production was about 160 MCM and the gas consumption by Kodo-Barq-e-Mazar-e-Sharif was 136 MCM. More than 85% of production was consumed by the fertilizer and its power plant, Kodo-Barq-e-Mazar-e-Sharif. The average daily gas consumption by the fertilizer plant over the months between January 2012 and July 2012 was 374 MCM, as illustrated in the table below.

Table 10: Natural Gas Production and Consumption in 2012

Concept	Unit	Progess since	Average per month	Average per day	Part of each in %
Production of Natutral gaz	000 CM	91,868.0	13,124.0	437.5	100.0
Routing to Kodo Barq-e-Mazar	000 CM	78,625.0	11,232.1	374.4	85.6
Routing to others destination	000 CM	3,694.0	527.7	17.6	4.0
Technical expense, wells ventilation	000 CM	3,762.0	537.4	17.9	4.1
Internal expense	000 CM	553.0	79.0	2.6	0.6
Expense and waste	000 CM	5,234.0	747.7	24.9	5.7

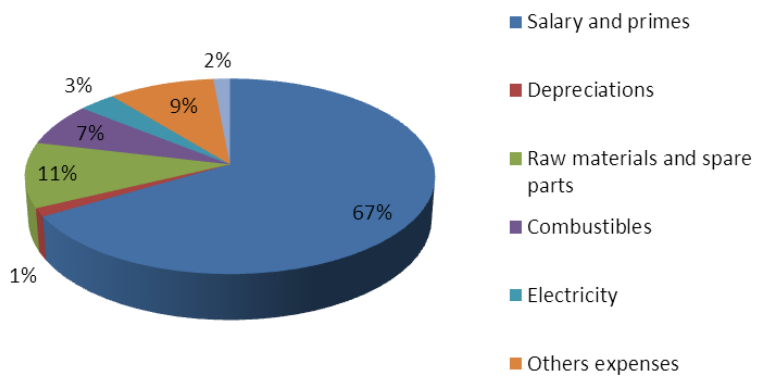
Sources: Ministry of Mine, Afghan Gas Enterprise

For the same period in 2005 (December to July) both gas production and consumption amount was alike while demand for substitute products has increased. That means that the capacity of the production is very low due to minimal investment to modernize the gas infrastructure. According to several studies the Kodo-Barq-e-Mazar-e-Sharif plant is not running at its full capacity, rather only about 30%.

6.3 Prices

Production, transmission, distribution and price policy of natural gas are the responsibility of the State Owned Enterprise, Afghan Gas Enterprise (AGE) under the Ministry of Mines [and Industry?]. The current natural gas cost price is very low on a regional basis. It depends on the low cost of production and the regulated price. In fact, most of the infrastructure for the natural gas is very old and in poor condition. While the salary levels at AGE are not very high, salaries and contractor costs account for 67% of the gas price. The following figure shows the different components of natural gas price.

Figure 15: Components of the Natural Gas Price



AGE charges residential, commercial and industrial sectors through different prices and these prices were relatively flat for many years. The average AGE's sales price in 1391 (2012-2013) is 1.74 Afs per cubic meter (US$34/MCM). The prices charged by AGE to the main consumers are:

1. The fertilizer plant and power generation plant, US$34.8/MCM.

2. Domestic use, US$79/MCM.

7 Legal framework

According to the Hydrocarbons law 2008-2009 (1387), all Hydrocarbons located on or underground in the territory of Afghanistan are the exclusive property of the State. The Ministry of Mine formulates and implements policies relating to Hydrocarbons and their development. It also monitors all hydrocarbon operations, organizes proposals for participation of persons in bidding round, and executes production contracts on behalf of Afghanistan.

At the request of a Contractor, the State may put its owned area and/or privately owned land at disposal of the Contractor with the consent of the owner for the duration of the Contract. There are closed and restricted areas like archeological or cultural area, land forming parts of an airport, or land owned by the Ministry of Defense, etc. There are four Types of Contracts:

1. Exploration and Production Sharing Contracts: The Contractor has the exclusive right to explore for Hydrocarbons.
2. Service and Production Sharing Contracts: Contractor will be granted the exclusive right of operation to upgrade and rehabilitate Hydrocarbon production facilities.
3. Contracts for Geological/Geophysical/Geochemical Services: The contractor has the right to conduct geological/ geophysical/geochemical services in an identified area.
4. Contracts for Pipeline Operations: This contract grants the right to construct pipelines and associated facilities (pumping stations, storage tanks or valves) and carry out the storage and transportation operation of Hydrocarbons.

The main features of the Hydrocarbons Law and in the contracts for the Exploration and Exploitation activities are:

1. Bidding is the normal procedure for the all contracts.
2. Exploration time is 10 years. If there is a discovery of Hydrocarbon in the contract area, the term of the contract may be extended. A commercial discovery allows extending the term of the contract and production phase for a term that will not exceed 25 years from the date the discovery was made. Services, pipeline, and production contracts time is 25 years and can be extended for 10 years.
3. The Contract Area shall be designated and specified in accordance with the geographical coordinates of the area or region. The rights or any part thereof granted under the Contract to any other person is not transferable unless the ministry agrees.
4. In accordance with the relevant procedures, contractors may renounce Exploration contracts with a written document.
5. The contractor may take into service a subcontractor and or will provide copies of all such subcontracts to the Ministry of Mines and the Ministry of Finance.
6. The Contractor may transport its share of the oil and gas to anywhere. The Ministry of Mines determines transportation tariffs for the use of the Pipeline.
7. Contractor should protect the environment in accordance with the standards of the hydrocarbon industries, should not cause any harm to the human health, and respects International norms relating to labor, social protection and human rights.
8. For the similar good and services available in the Afghan market, the contractor has to purchase and procure the Afghan goods and services.
9. Contractor will be obliged to supply oil and gas to the State for an acceptable market value.
10. Contractors should pay their income taxes, levies and customs duties, and royalties.
11. The Inter-ministerial Commission determines the royalty rate for the quantities of Liquid Hydrocarbons and Natural Gas.

12. Transfer of Foreign Exchange is very easy and there is no barrier to transfer foreign currency and foreign capital invested in the Hydrocarbon Operations, dividends, and other profits.
13. The State guaranties that Contractor contract rights may not be expropriated, except if authorized by a Law and in case of public necessity. In case of expropriation compensation shall be made.
14. The future price determination is not clear. For the current price as Afghan Gas Enterprise, is a State enterprise and has the responsibility of the production, transmission and distribution of natural gas, it is deemed that the natural gas price is regulated.

8 Macroeconomic Preliminary Impact of SGDP

In this section the macroeconomic impact, in particular over the GDP growth, of the SGDP is analyzed. In the first part, the methodology adopted in the document is described, then some assumptions are created about the future behavior of the Afghan economy. Finally, the rate of growth of GDP with and without the SGDP is shown.

8.1 Context

The direct impact of the SGDP will be reflected in an increase of the natural gas production and also more domestic electricity generation. According the Central Statistics Organization of the Islamic Republic of Afghanistan, the natural gas production is registered in the "Mining and Quarrying" sector and the electricity generation in the "Electricity, Gas and Water" entry, for that reason, it is useful to review the participation of this sector in the country's GDP. In that sense, Table 11 presents: a) the evolution of GDP (at current prices) of this sector and for the country in the period 2002-2012; b) the evolution of GDP (at constant prices) of this sector and for the country in the period 2002-2012; and c) the implicit deflator of the variables.[4]

Table 11: GDP (Million Afs)

Year	Mining and quarrying			Electricity, gas and water			GDP at Market Price		
	GDP Constant Prices	GPD Current Prices	Implicit Deflator	GDP Constant Prices	GPD Current Prices	Implicit Deflator	GDP Constant Prices	GPD Current Prices	Implicit Deflator
2002-03	264.0	264.0	1.00	121.0	121.0	1.00	202,530.0	202,531.0	1.00
2003-04	256.0	290.0	1.13	173.0	280.0	1.62	219,195.0	240,671.0	1.10
2004-05	493.0	638.0	1.29	163.0	312.0	1.91	224,329.0	267,311.0	1.19
2005-06	580.0	880.0	1.52	195.0	461.0	2.36	246,541.0	327,745.0	1.33
2006-07	695.0	1,224.0	1.76	197.0	562.0	2.85	269,127.0	375,152.0	1.39
2007-08	1,213.8	2,213.5	1.82	215.5	629.6	2.92	312,436.4	518,610.8	1.66
2008-09	1,247.4	2,481.0	1.99	177.7	526.8	2.97	319,725.6	541,111.6	1.69
2009-10	1,412.0	2,921.0	2.07	200.8	630.0	3.14	374,795.0	632,715.0	1.69
2010-11	2,018.0	4,473.0	2.22	201.0	640.0	3.18	386,929.0	746,855.0	1.93
2011-12	3,834.0	10,396.0	2.71	182.0	605.0	3.32	423,657.0	903,990.0	2.13

Source: Central Statistics Organization - Islamic Republic of Afghanistan, ADB

Some observations can be made with the data of the previous table: a) the participation of the Mining and Quarrying sector has increased from 0.13% to 0.90% of the GDP, the contrary happens in the Electricity, Gas & Water sector, where the participation has decreased from 0.06% to 0.04% (Figure 16); b) the implicit deflator of the Electricity, Gas & Water sector grew faster than the rest of the economy average, while the Mining and Quarrying sector grew to a lesser extent, which suggests that there was an increase in utility rates for water, gas and electricity at the beginning of the previous decade, see Figure 17; and c) both sectors don't have a significant share in the GDP on the country, 0.95% of the total, even for sectors with low added value, like these.

Figure 16: Participation on Total GDP (%)

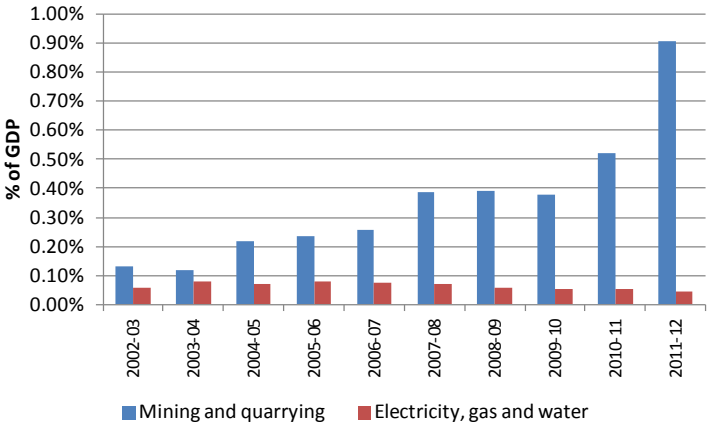
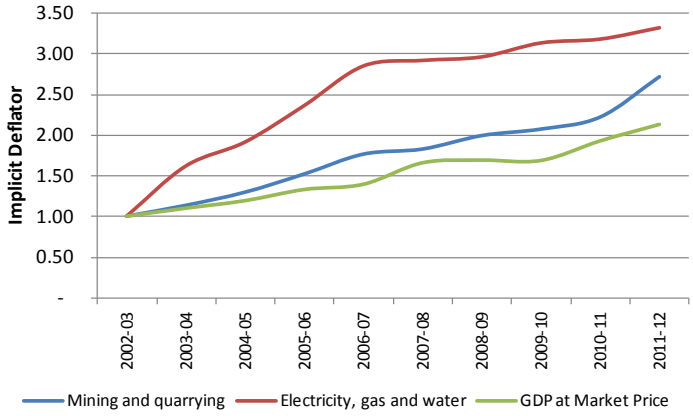


Figure 17: Implicit Deflators



The annual rate of growth for the variables in the previous table is presented in the following table. The annual average rate of growth for the GDP (at constant prices) was 8.5%, for the Mining and Quarrying sector 34.6% and for the Electricity, Gas and Water sector 4.6%. In that sense, the greater participation of the Mining and Quarrying sector (mentioned previously) can be explained for high growth in the production in 2004-05, 2007-08 and 2011-12 (Figure below). For example, for the period 2011-2012, the Mining and Quarrying sector explains almost the 10% of the country's growth; also, the rate of growth of the producer prices for this sector (the implicit deflator) in Figure 18, it is clear that the world financial crisis of 2008-2009 also affected the sales prices for the Afghan production. Regarding the Electricity, Gas and Water, Figure bellow shows a modest growth in production, especially in the last three years and a great adjustment in the sales prices at the beginning of the previous decade, but since 2007-2008 these prices were not adjusted.

Table 12: Annual Rate of Growth (%)

Year	Mining and quarrying			Electricity, gas and water			GDP at Market Price		
	GDP Constant Prices	GPD Current Prices	Implicit Deflator	GDP Constant Prices	GPD Current Prices	Implicit Deflator	GDP Constant Prices	GPD Current Prices	Implicit Deflator
2002-03									
2003-04	-3.0%	9.8%	13.3%	43.0%	131.4%	61.8%	8.2%	18.8%	9.8%
2004-05	92.6%	120.0%	14.2%	-5.8%	11.4%	18.3%	2.3%	11.1%	8.5%
2005-06	17.6%	37.9%	17.2%	19.6%	47.8%	23.5%	9.9%	22.6%	11.6%
2006-07	19.8%	39.1%	16.1%	1.0%	21.9%	20.7%	9.2%	14.5%	4.9%
2007-08	74.7%	80.8%	3.5%	9.4%	12.0%	2.4%	16.1%	38.2%	19.1%
2008-09	2.8%	12.1%	9.1%	-17.6%	-16.3%	1.5%	2.3%	4.3%	2.0%
2009-10	13.2%	17.7%	4.0%	13.0%	19.6%	5.8%	17.2%	16.9%	-0.3%
2010-11	42.9%	53.1%	7.1%	0.1%	1.6%	1.5%	3.2%	18.0%	14.3%
2011-12	90.0%	132.4%	22.3%	-9.5%	-5.5%	4.4%	9.5%	21.0%	10.5%

Source: Central Statistics Organization - Islamic Republic of Afghanistan, ADB

Figure 18: Annual Growth for Mining and Quarrying Sector

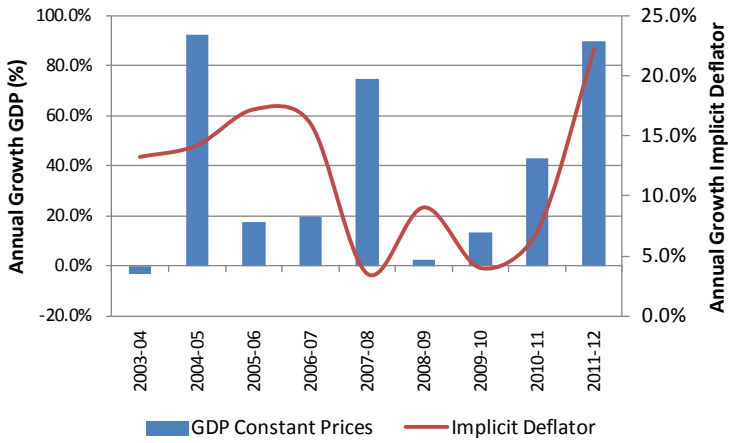
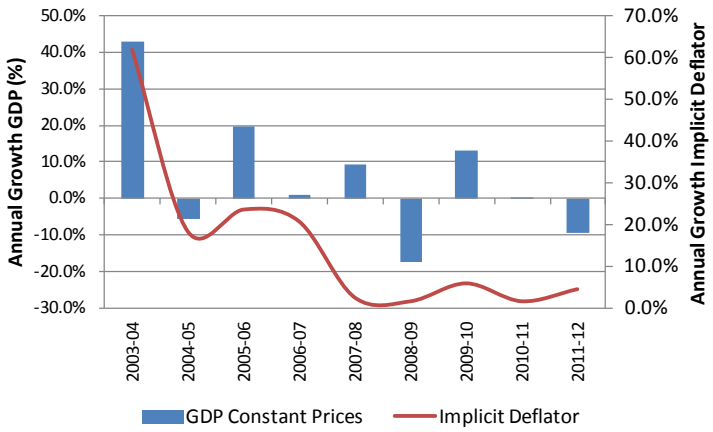


Figure 19: Annual Growth for Electricity, Gas and Water Sector



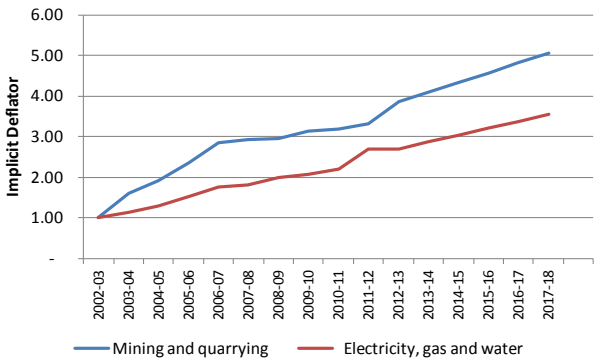
8.2 Methodology and assumptions

The SGDP will improve the macroeconomic indicators, at least, in two aspects: 1) more natural gas production; and 2) more electricity generation. In that sense, the following methodology was used in this report: using information on prices and volumes, the gross value of production was estimated for each sector, then, to introduce these figures to the national accounts (GDP) the added value for the gas and power sectors was separated, in order to not double account the impact; after that, these results were put in constant prices using the GDP deflator for each sector. Finally, using a reasonable projection of the exchange of rate, the results are shown in US$. The main assumption, related with the natural gas

production, the electricity generation, is the rate of growth of the Afghan economy, the projection of inflation and the exchange of rate, are as follows:

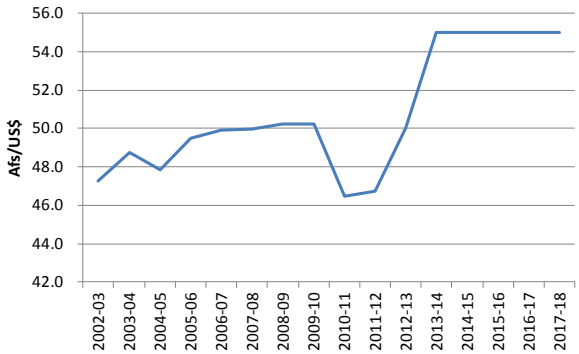
1. The projected operational capacity is: 50% for 2015-16, 75% for 2016-17 and 100% for 2017-18; for gas and power sectors.
2. When the project reaches 100% of capacity, the total production of natural gas will be 435.6 MMCM per year and 1,489 million kWh per year.
3. Since the final price is subject to negotiation between both sectors, the following prices are assumed: a) 1.74 Afs per CM[4] and b) 4.79 Afs per kWh.[5] The information for the natural gas is the average price reported by Afghan Gas Enterprise (AGE) in 2012 and, the electricity price is the average price for Afghanistan in 2011 reported by the Central Statistics Organization.
4. For period 2003-2012, the average annual rate of growth of the Afghan economy was 8.67% and the standard deviation was 5.48%, in that sense, the forecast for the period 2013-2018 a very conservative annual rate of growth equal to 3.20%.[6]
5. The following Figure presents the projections of deflators for both sectors using linear standard estimates.

Figure 20: Implicit Deflator Projection



6. The projection of the exchange of rate is presented in the following graph and the same values are used observed in 2013 for the next years.

Figure 21: Exchange of Rate Projection



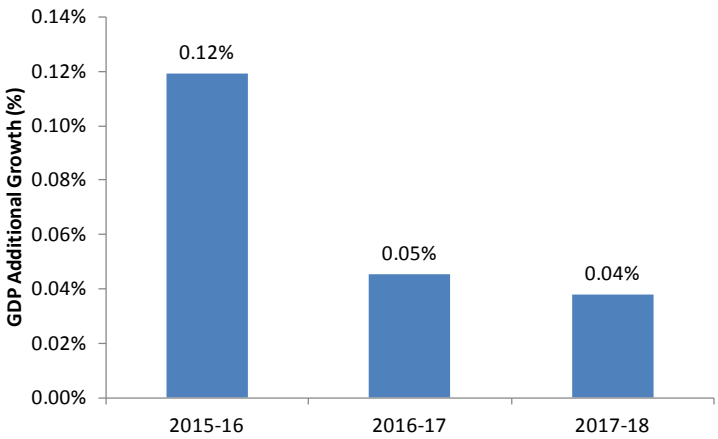
8.3 Results

Using the methodology and assumptions described in the previous section, it was estimated that the additional growth for GDP due to the SGDP, that is, the impact over the total Afghan economy growth of additional natural gas and electricity production from the Sheberghan Gas Development Project, was

[4] This price is equivalent to US$34.8 per thousand CM.
[5] This price is equivalent to US$9.6 cents per kWh.
[6] 3.20% = 8.67% - 5.48%.

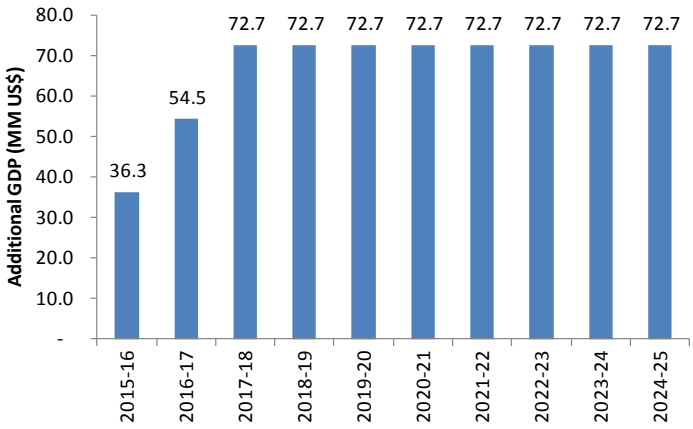
between 0.12% and 0.04%. These results do not seem high, but it is important to note that the participation in the total Afghan GDP of both sectors is low, because the increase in the Mining and Quarrying GDP is between 0.9% and 2.8% and in the Electricity, Gas and Water sector between 17% and 218%.

Figure 22: GDP Additional Growth Because of SGDP (%)



The previous results are related with the GDP rate of growth, then, regarding the additional GDP in absolute terms, Figure 23 presents the forecast for the period 2015-2025 in MM of US$. As can be seen, the project starts with 50% capacity then, after 2 years, reaches the 100% operations level and for that reason, the additional GDP in 2017-18 reaches the highest value (US$72.7 MM), after which it remains constant. Also, it is noteworthy that the projection in absolute values goes through year 2025 but the annual growth impact only goes to 2018 because after that year the additional production impact is assumed to be zero.

Figure 23: Additional GDP because of SGDP (MM US$)



9 Conclusions

The main conclusions of this report are:

Gross Domestic Product

- The Afghan economy has recently experienced growth at very high rates, with the Gross Domestic Product (GDP) annual rate of growth is nearly 12.3%. However, that rate is applicable to a very low base, a GDP per capita near the US$600 level. This growth was supported by, most important, an increase in the services, and an increase in the agriculture sector.
- The major impact, over the energy sector, of the high Afghan rates of growth is reflected in an increase in the volume of oil derivatives imports. This issue, exacerbated by an increase in international oil prices, has generated a substantial deficit in the international current account balance for the country, because the exports have not grown as expected.
- As indicated, the increase in the economic activity generated an annual rate of growth in the oil derivatives imported volumes, above 35%; and, the imports of those oil products in 2011 represented almost 33% of total imports.

Natural Gas

- Although the Afghan reserves of natural gas are substantial, estimated at 1 TCM by the USGS, the current production of natural gas represents only 5% of that peak output in the 1970's. For the 2011-2012, total reported natural gas production was 160,354 MCM, a small increase (11%) from the 2010-2011, but this is due to a single well rehabilitation and not driven by sustained structural measures.
- In 2011-2012, the total natural gas production was about 160 MCM and the gas consumption by Kodo-Barq-e-Mazar-e-Sharif was 136 MCM. In that sense, more than 85% of production was consumed by the fertilizer and power plant, Kodo-Barq-e-Mazar-e-Sharif; the rest of the production is mainly used in the domestic and power generation sectors. The Fertilizer plant's average daily gas consumption over the months between January 2012 and July 2012 was 374 MCM.
- The average AGE's sales price in 1391 (2012-2013) is 1.74 Afs per cubic meter (US$34/MCM). The prices charged by AGE to the main consumers in Sheberghan are to the fertilizer plant and its power generation plant, US$34.8 /MCM; for the domestic users, US$79/MCM.
- Using the methodology and assumptions described above it was estimated that the additional annual growth for GDP from the SGDP, that is, the impact over the total Afghan economy growth of additional natural gas and electricity production due to the Sheberghan Gas Development Project, could be between 0.12% and 0.04%. These results may not seem high, but it is noteworthy that the participation in the total Afghan GDP of both sectors is low, since the increase in the Mining and Quarrying GDP is between 0.9% and 2.8% and in the Electricity, Gas and Water sector between 17% and 218%. Previous results are related with the GDP rate of growth, then, regarding the additional GDP in absolute terms, the additional GDP in 2017-18 reaches the highest value (US$72.7 MM), after which the impact remains constant.

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