Afghanistan: Oil & Gas Industry

Sector Overview

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Executive Summary

The goal of this report is to provide options to improve Afghanistan's oil security - both in the short-term and long-term. *In the short-term*, we: (1) to asses FLGE's capacity to supply oil and gas to the MoD & MoI, and (2) to evaluate the option of building a strategic petroleum reserve (SPR) in Afghanistan. We find that FLGE likely does have the capacity to supply Afghanistan's domestic needs, and that operations can be further improved with some organizational restructuring and financial investments. We also find that the creation of a limited 350,000 MTs SPR – with the reserves comingled with private stocks – seems to be the best SPR option over a medium-term horizon. *In the long-term*, we provide recommendations to increase upstream oil production and build the country's refining capacity. Currently private sector refineries have the capacity to refine half of total oil supply of Afghanistan, with combined capacity of 32,500 barrels per day.

Afghanistan has estimated reserves of 1,908 million barrels of crude oil + 59 trillion cm of natural gas + 667 million barrels of liquid gas. However, the country produces only 8,000 barrels of oil and 59 billion cm of gas per year. To compensate for this lack of domestic production, Afghanistan imported more than 4 million MTs of oil in 2014. Most of this oil was imported from Iran, Turkmenistan, and Uzbekistan

Total consumption in Afghanistan was 4.0 million MTs in 2014: private consumption of 1.7 million MTs through imports + coalition forces consumption of 1.3 million MTs + government consumption of 1.0 million MTs. However, in 2015, coalition demand dropped significantly to 0.42 million MTs. There are about 35 companies that dominate the importing and distribution of oil and gas

In term of storage, both government and private sector have storage capacity of 415,752 MTs located throughout Afghanistan: This includes FLGE capacity of 238,023 MTs + MoD/MoI capacity of 23,888 MTs + private storage capacity of 153,841 MTs. However, much of the FLGE capacity remains empty and MoI estimated its required oil storage capacity 42,858 MTs. If we decide to move forward, we could repair FLGE facilities, construction new reservoirs for MoD & MoI. We estimated that and filling up 185,640 MTs of operational reservoirs over 2 years costs $101 million and building of 350,000 MTs SPR costs of $190 million over 5 years.

The industry's major challenge is its regulatory framework. There are too many regulatory agencies overseeing the industry. We therefore recommend the formation of the Afghan Petroleum and Gas Authority to oversee the industry

Afghanistan's national oil state-owned enterprise FLGE is currently a profitable business. The company generates $4.5 million (1393) in revenue. The company owns 238,023 MTs of oil and gas capacity and 94 trucks. A turnaround of the company is achievable during the next few months. We believe that the GoA should continue with another one-year bridge contract while FLGE is reformed. If we are able to execute the company turnaround by December, the bridge contract could be cancelled before it begins, and FLGE could handle fuel transport and storage for all GoA entities.

Summary of Recommendations *(Long-Term)*

To secure Afghanistan's long-term energy independence, Afghanistan needs to increase upstream oil production and build refining capacity

Increase Upstream Production

- Afghanistan has oil reserves of 1,908 million barrels of crude oil. Currently the country produces only 660 barrels per day. We estimated current consumption in Afghanistan to be 50,000 barrels per day
- Our strategic goal should be to increase oil production to 100,000 barrels per day in the long-term. At current prices, this would generate $1.5 billion in revenues per year, $730 million in export revenue, and almost $300 million in taxes for the government
- Increase in production capacity can be done through using applied production methods such as Enhanced Oil Recovery (EOR). But Afghanistan's upstream manpower trained during Soviet era and same as production technology left from that period. There is a need for modern technology and capacity building training for upstream specialists

Build Refining Capacity

- Currently Afghanistan has refinery capacity of 32,500 barrels per day. However, the refineries produce very low quality oil and they are generally inefficient in their production. Therefore, Afghanistan crude oil imports all its oil as finished refined products
- Over the next ten years, the country needs to build refinery capacity of 50,000 barrels per day or more. We estimate that building such refining capacity will cost $700 million and will take 3 years
- Also, we need the following facilities for constructing the refineries:
  - ✓ Land away from residential areas
  - ✓ Infrastructure for supply of raw materials and final products
  - ✓ Energy to operate the plants
  - ✓ Facilities for waste disposal

Summary of Recommendations *(Short-Term)*

To improve industry dynamics, we recommend: (1) the formation of the Afghan Petroleum and Gas Authority (APPGA) to consolidate all regulatory powers for the oil and gas industry, (2) to transfer FLGE & Afghan Gas as standalone SOEs under ICA, and (3) build a 350,000 MT strategic petroleum reserve over 5 years

APPGA should be created to regulate the upstream & downstream petroleum industry

- There is too much dispersion of responsibilities which provides lack of accountability among eight regulatory agencies.
- For example, survey/geo data is measured by DP of MoMP, but tendering contracts is kept by OGDSD, the price & import licensing by DPRD (MoCI) and FLGE monitor market. Incapability of regulatory power discourage investors and cause inefficiency of market
- APPGA will be accountable for industry performance. There is need for comprehensive plan and development strategy. APPGA should impose high taxes on second hand cars and apply storage approach to restructure the oil industry

FLGE should be reformed and placed under ICA

- Move FLGE to ICA and complete a financial audit within three months
- Develop a strategic plan for FLGE to outline the operating improvements that will be implemented over the next year
- Allow for a one-year bridge contract to supply MoD / MoI
- After every quarterly, conduct an assessment whether FLGE will be able to supply government users of oil at the conclusion of the bridge contract period

A 350,000 MT strategic oil reserve should be developed over 5 years

- Strategic reserve project can be implemented in 2 phases
- *Phase one*: includes maintenance of FLGE operational storage facilities (capacity 163,100 MTs)
  - ✓ *Infrastructure maintenance and purchase of oil (100,000 MTs)*
  - ✓ *Timeframe for full capacity utilization of old storage facilities is 18 months*
- *Phase two*: includes reconstruction of FLGE non-active storage facilities (capacity 59,000 MTs)
  - ✓ *Building new infrastructure*
  - ✓ *Repair storage tanks*
  - ✓ *Installation new tanks*
  - ✓ *Purchase oil*
  - ✓ *30 months duration needed to complete project*

Policy Recommendations *(Short-Term)*

Three main policy measurements : (1) signing bilateral supply agreement with oil producing countries, (2) auction of one or two contracts from those countries, (3) issuing licenses to distribution companies

Sign bilateral agreement with oil producing countries

- *Turkmenistan:* has 2 oil refinery with total distillation capacity of 237,000 bbl/day. EIA reports exports of crude and total refined products were about 48 bbl and 74 bbl per day. It has also oil storage and distribution facilities at Tagtabazar near the Afghan border. 30% of Afghanistan import is from Turkmenistan.

- *Azerbaijan:* The country is mainly a crude oil and condensate exporter, but it also exports small volumes of petroleum products. It produced 310 million MTs of oil between 2004-14, yet Afghanistan does not have import from Azerbaijan

- *Kazakhstan:* The country ranked of the world's top oil-producing nations. Kazakhstan petroleum output increased to 150 million MTs by 2015. Afghanistan import 8% of its oil from Kazakhstan

- *Russia:* It produced an average of 10.2 million barrels of oil per day. It produces 12% of the world's oil, Russian crude oil and condensate production reached to the post-Soviet maximum of 9.7 million barrels per day. About 18% of Afghanistan import is from Russia

- *Iran:* Iran produced 5.1 percent of the world's total crude oil. In 2012, Iran, which exports around 1.5 million barrels of crude oil a day, was the second-largest exporter among the OPEC countries. About 35% of Afghanistan oil import is from Iran

GoA auction of one or two contract from oil producing countries

Considering price and quality of oil, Afghanistan will place contracts with largest companies from oil producing countries. They are as following:

- Turkmengaz (Turkmenistan)
- Turkmenneft (Turkmenistan)
- SOCAR (Azerbaijan)
- Kazmuneygas (Kazakhstan)
- Gazprom (Russia)
- Lukoil (Russia)
- Rosneft (Russia)
- NIOC (Iran)

GoA will license of distributing companies in the country

For better oil quality, we recommend that the GoA license of 5 to 10 companies for distribution of oil throughout Afghanistan

Currently, there are only a few companies & more than 2,000 private pump stations involved in the distribution of oil

The licensing process would be executed in three steps: (1) Pre-qualification assessment, (2) Invitation of bids, and (3) Bid approval

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Afghanistan has an estimated 2,158 million barrels of crude oil and natural gas reserves. However, the country produces only 8,000 barrels of oil and 59 billion cm of gas per year

Afghanistan has two large oil & gas reserve basins

Afghan Tajik Basin Province

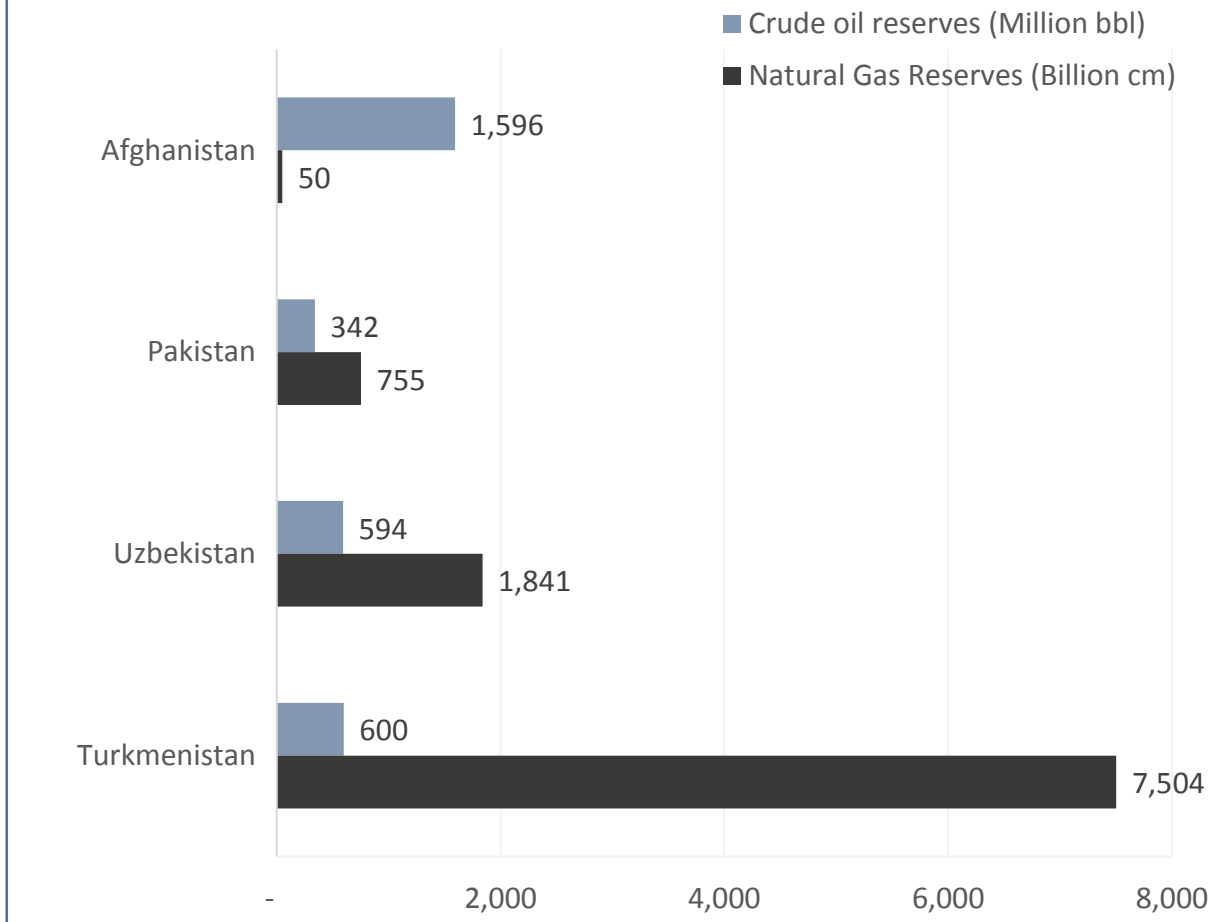
- 962 million Barrels of crude oil
- 52 trillion of natural gas
- 582 million barrels of liquid gas

Amu Darya Basin Province

- 946 million Barrels of crude oil
- 7 trillion of natural gas
- 85 million barrels of liquid gas

*Note: 1 ton is equal to 7.33 barrels

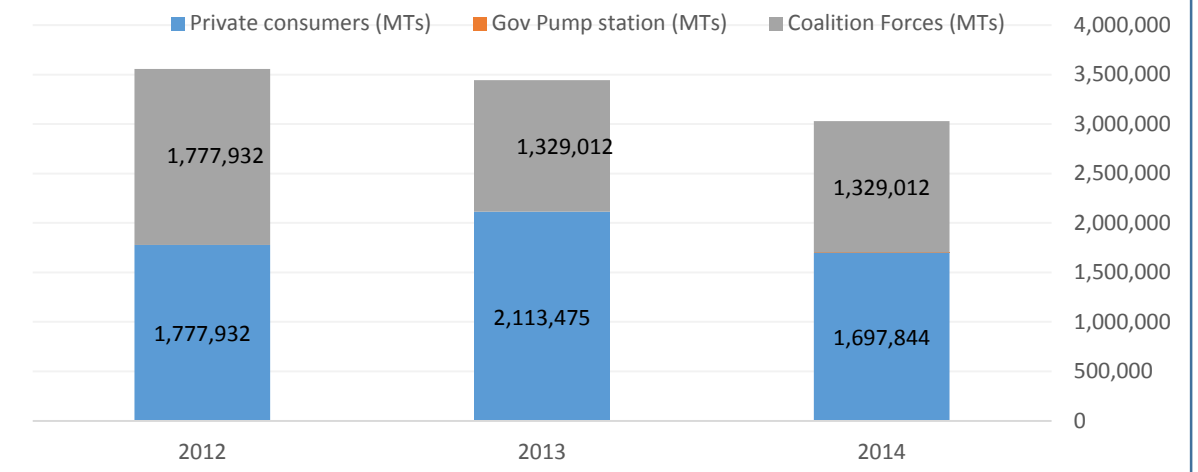
These basins provides larger estimated oil reserves and smaller gas reserves versus neighboring countries



Source: CIA factsheet 2014

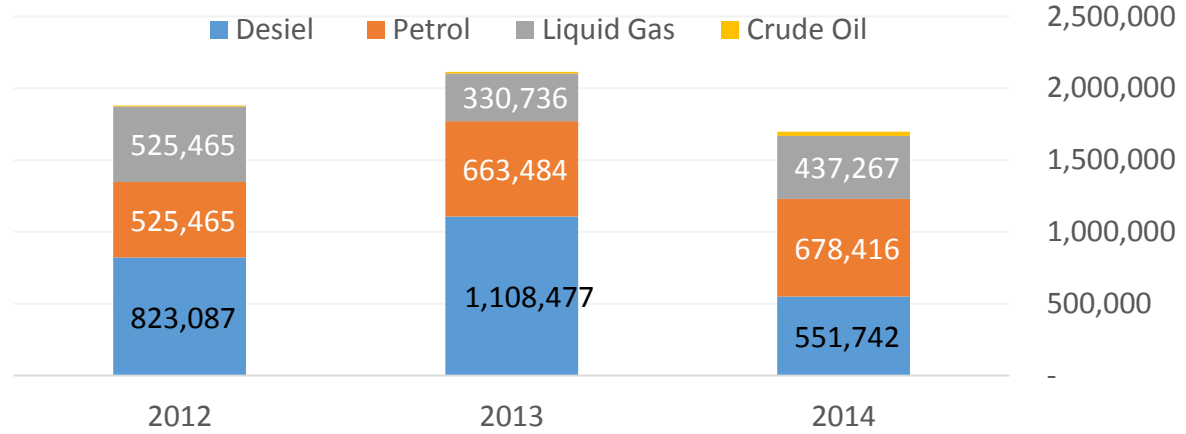
Private consumption is estimated to be relatively stable at ~1.7 million MTs, while coalition demand has dropped from 1.75 million MTs to 1.33 million MTs (2014) t0 0.42 million MTs (2015)

Coalition demand has declined to 1.33M MTs in 2014



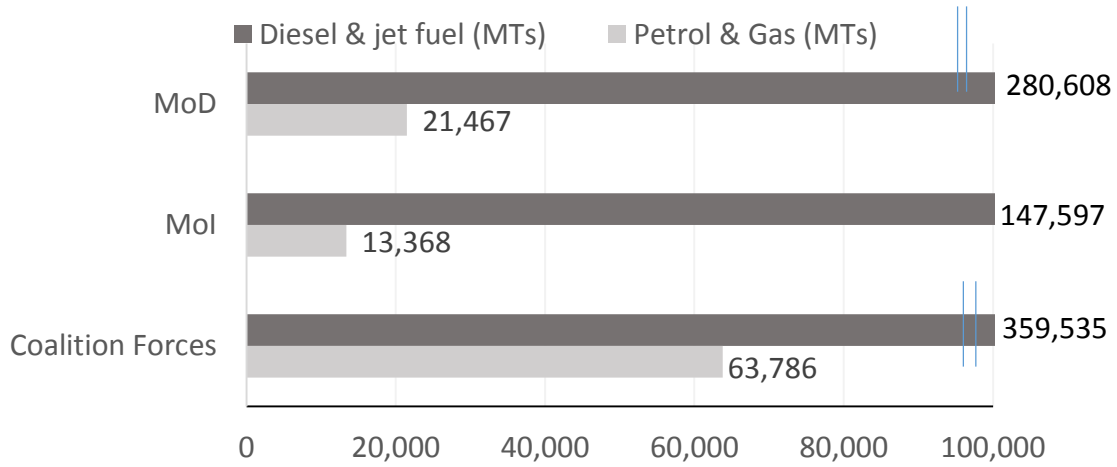
Source: MoCI 2014

44% of private consumption is diesel versus 33% for petrol



Source: MoCI 2014

The GoA military consumption in 2015 is 0.88 million MTs: MoD (0.3M) + MoI (0.16M) + Coalition (0.42M)



Source: National Procurement Directorate, MoIC (2015)

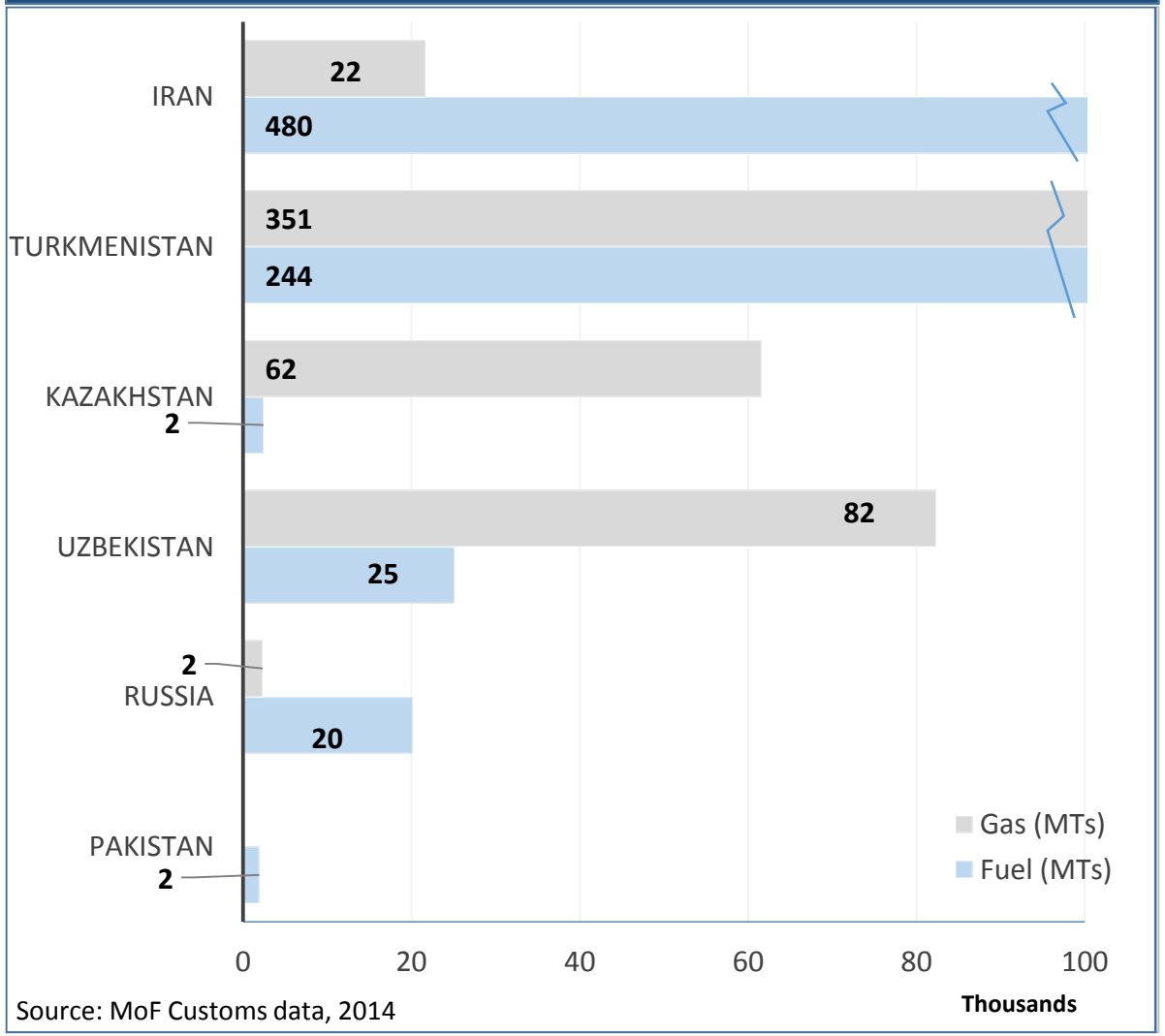
NATO estimates MoD + MoI annual fuel consumption to be ~0.22M MTs

MoD Corps	*Diesel/Petrol*	**MoI Zone**	*Diesel/Petrol*	**MoD Corps**	*Aviation Fuel*
201st	14.5M	202	17.1M	201st	0.3M
203rd	18.8M	303	21.1M	203rd	0.9M
205th	22.7M	404	9.3M	205th	1.5M
207th	13.9M	505	21.3M	207th	1.1M
209th	21.1M	606	7.6M	209th	1.6M
215th	17.6M	707	10.2M	215th	0.9M
Capital	69.0M	101 (HQ)	16.9M	Capital	5.9M
Total (liters)	**177.6M**		**103.5M**		**12.2M**
Metric Tons	**131,424**		**76,590**		**9,028**

Source: NATO (2015)

Afghanistan imports most of its oil from Turkmenistan, Uzbekistan and Russia. Most of the imported oil is Diesel and Petrol

Afghanistan imported the most oil and gas from Turkmenistan, Iran and Uzbekistan



Source: MoF Customs data, 2014

**Note: total record of oil and gas import from custom (MoF) shows 1.3 million MTs. CSO import record shows 2.9 million MTs of oil and gas for 2014*

Turkmenistan is Afghanistan's second largest oil importing source

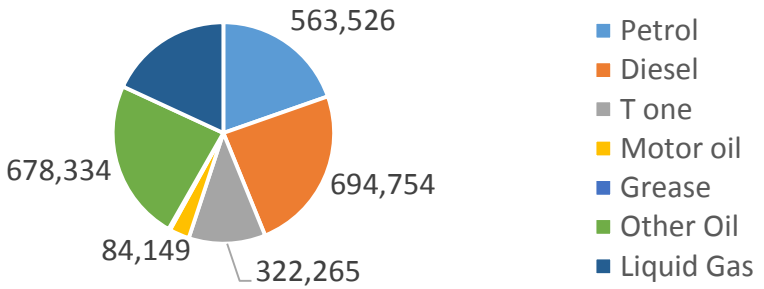
Overview: It is the sixth largest natural gas reserve holder in the world and was the second largest dry natural gas producer in Eurasia, behind Russia, in 2012

Reserves/Production: It had 600 million barrels of proven crude oil reserves as of January 2014

Pipelines: It has a small domestic crude oil pipeline network linking with the Turkmenbashi refinery and the Caspian port. It has an international pipeline at the Shymkent refinery in Kazakhstan via Uzbekistan

Refineries: Turkmenistan has two oil refineries, the Seidi and Turkmenbashi, with a total crude oil distillation capacity of almost 237,000 bbl/d

Afghanistan imports mostly diesel (39%), other oil (29%) and petrol (24%) in 2014



Source: Central Statistic Office data, 2014

Uzbekistan and Azerbaijan are other potential sources for additional fuel imports into Afghanistan

Uzbekistan is Afghanistan's third largest oil importing source

Overview: Uzbekistan was the third largest natural gas producer in Eurasia, behind Russia and Turkmenistan in 2012. With a highly energy-intensive economy, Uzbekistan holds sizeable hydrocarbon reserves of mostly natural gas

Reserves/production: In 2013, total crude oil and other liquids production was about 102,000 barrels per day (bbl/d), of which 30% came from natural gas plant liquids. Roughly 60% of all known oil and natural gas fields are located in the Bukhara-Khiva region. The region is the source of approximately 70% of the country's oil production

Pipelines: insufficient pipelines to export higher volumes of hydrocarbons and aging energy infrastructure have slowed the production, distribution, and exports of hydrocarbons in recent years

Refineries: has three oil refineries located in Ferghana, Alty-Arik and Bukhara, with a total crude oil distillation capacity of 224,000 bbl/d

Afghanistan currently does not have import from Azerbaijan

Overview: is among the oldest oil producers in the world. Oil and natural gas production and export are central to Azerbaijan's economic growth. The country is one of the Caspian region's most important strategic export routes to the West

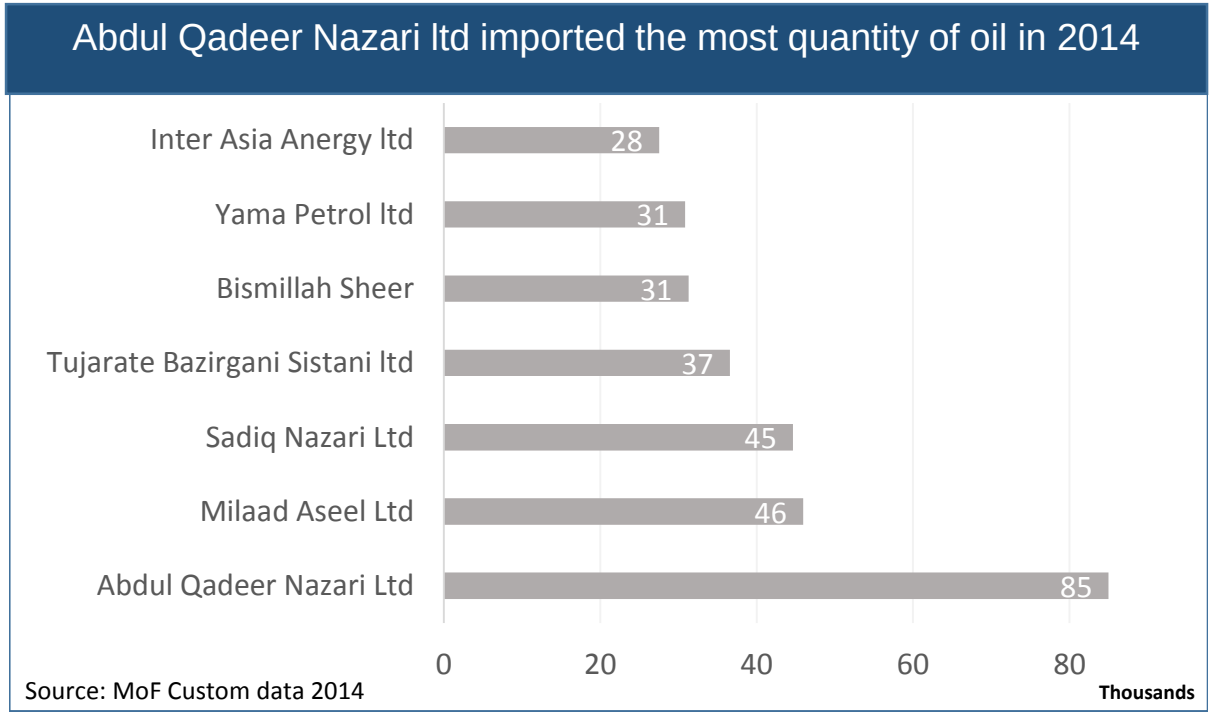
Reserves/ Production: Unexpected production problems at its largest fields caused total output to fall to below 1.0 million bbl/d in 2011, and total production continued to decline through mid-2013. The country is mainly a crude oil and condensate exporter, but it also exports small volumes of petroleum products

Pipelines: the completion of the BTC pipeline transformed Azerbaijan's oil industry, unlocking the country's oil sector potential by providing an outlet to world markets for crude oil

Refineries: the State Oil Company of Azerbaijan Republic (SOCAR) is involved in all segments of the oil sector

There are only a handful of large importing companies. They import mainly through 3 ports: Herat, Nimroz, & Andkhoi

Abdul Qadeer Nazari ltd imported the most quantity of oil in 2014



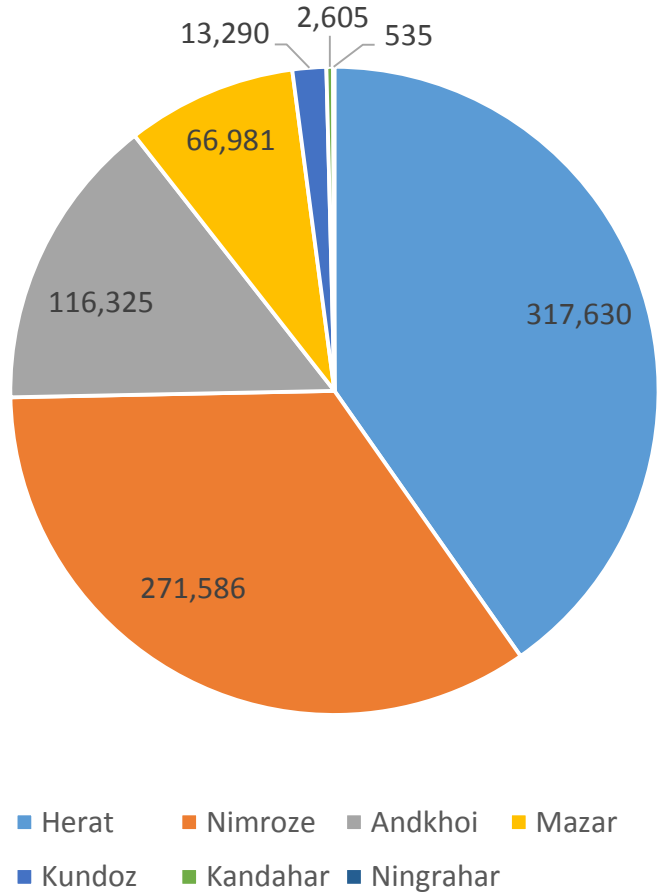
Source: MoF Custom data 2014

**Note: this data seems to represent only a small proportion of total estimated imports*

	Variation of data between the following sources		
	CSO	Mof	MoCI
Private Import	2,869,898	1,308,530	1,697,844
Public Import	--	--	1,816
Coalition Import	--	--	1,329,012
Total			**3,028,672**

**Note: There is variation between CSO, Mof and MOIC data. Also, if we add up private import data of CSO, public import of MoCI and Coalition forces data, we will get the total import of 4,200,726*

Afghanistan imported 705,541 MTs of oil from Herat and Nimrooz and Andkhoi ports in 2014

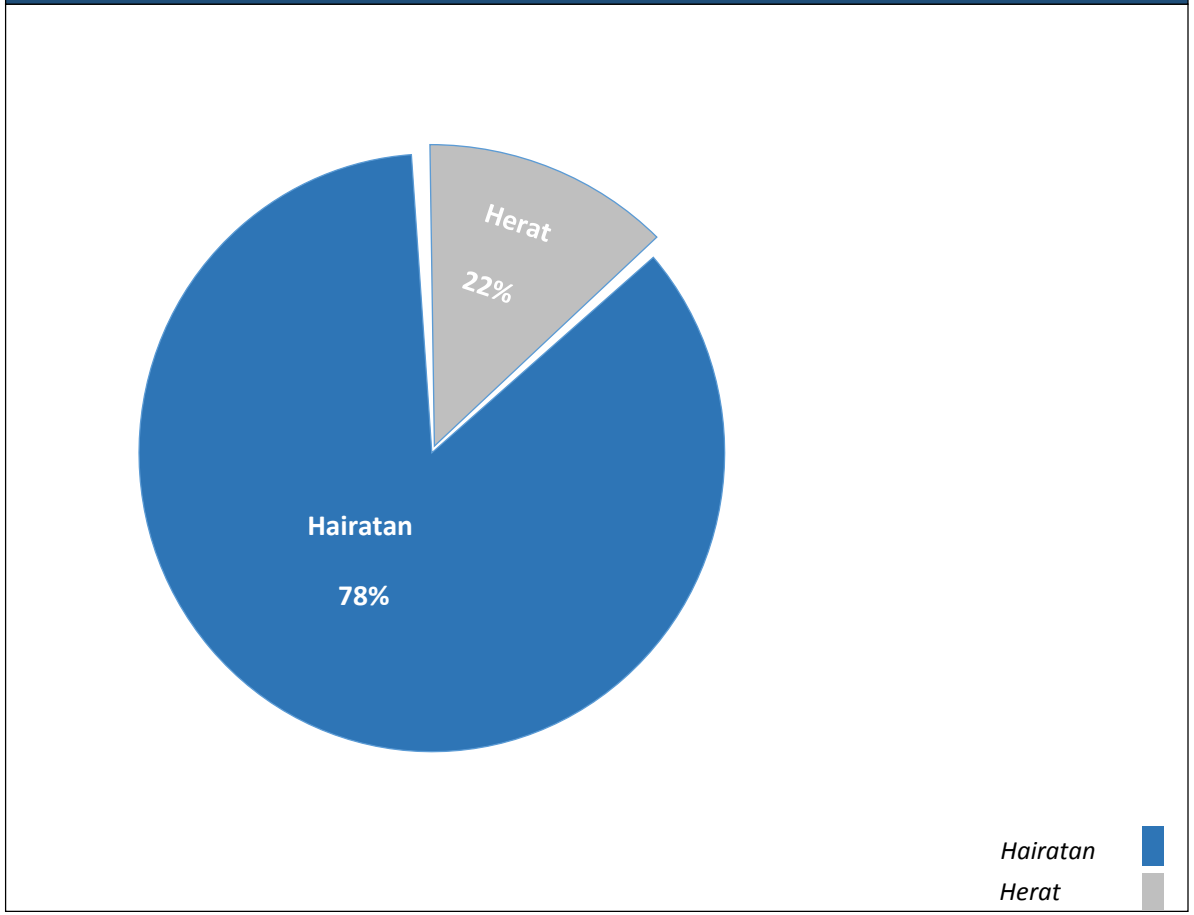


Source: MoF Custom Data 2014

**Note: 519,579 MTs of Gas imported from Herat, Mazar, Andkhoi and Nimroz Ports in 2014 of which 307,360 MTs were imported through Herat port only.*

Private sector refineries have the capacity to refine half of total oil supply of Afghanistan, with combined capacity of 4,500 MTs per day,

78% of the refineries are located in Hairatan



**Note: currently the refineries are non operational due to import prohibition of crude oil*

Seven companies invested in building private refinery centers

Company	Capacity	Location
Kaam Group	500	Hairatan
Kaam Group 2	500	Hairatan
Kaam Group 3	500	Hairatan
Ghazanfar	500	Hairatan
Inter Asia	1000	Hairatan
Mazar shareef refinary	500	Hairatan
Asia Hareua Energy	1000	Herat
Total (MTs/day)	**4,500**	

We built a financial model to estimate the amount of fuel the GoA can store in official reservoirs

Our financial model includes three parts: (1) filling up the existing capacity GoA reservoirs, (2) construction of new reservoirs for MoD & MoI, and (3) the purchase of new fuel trucks.

The GoA has 185,640 MTs of operational reservoirs. Our model fills up this capacity over 2 years at a cost of $101 million. This cost includes $65 million for fuel purchases + $28 million to transport the oil + $8 million for operational and refreshment costs. We assumed $350 as the crude oil price and $150 transportation cost (by MT).

We also modeled out an increase of MoD & MoI capacity from 23,888 MTs to 238,860. This would cost $62 million over 2 years, assuming a construction cost of $260 per MT. We modeled the additional reserves by each of the seven MoD and MoI districts (111k MTs during 2016 and 127 MTs during 2017).

To fill all these capacity we estimated that we will need to purchase an addition 300 trucks (15 per quarter), taking the fleet from 100 trucks to 400 trucks over 5 years. We estimate that it will cost $18 million to purchase the new trucks, assuming a price of $600,000 per truck.

The GoA could auction of 5 to 10 companies for oil distribution through an open tender process with the following stages

Requirements

- ✓ Copies of certificate of registration
- ✓ Copies of tax clearance certificates
- ✓
- ✓ A signed statement that the bidder have not been convicted of any criminal offence relating to professional conduct
- ✓ Company Profile and Strategic business plan
- ✓
- ✓ Letter of bank guarantee
- ✓ minimum bids > $1M

licenses will be offered via an open tender process with the following steps

Step 1: pre-qualification

- ✓Announcement of tender
- ✓Receiving application documents for pre-qualification of tender
- ✓Evaluation of firm's documents
  - *Determining reasons to be qualified and disqualified*
  - *evaluation result sent to procurement authority for approval*
  - *Shortlisting pre-qualified candidates*
  - *Inviting all pre-qualified bidders to submit bids*

Step 2: Invitation of bids

- ✓ Issuance of bid documents to bidders (without fee)
- ✓ Submission of bid securities by bidders such as cash, bank guarantee
- ✓ Submission of signed bid together with the a power of attorney and financial proposals.
- ✓ Opening of bids and Evaluation of bids by committee
  - *Approval of bid evaluation report by Award Authority*

Step 3: Bid approval

- ✓ Invitation of expressions of interest
- ✓ Award of contract
- ✓ Payment of license fee
- ✓ Issuance of certificate by GoA

There are two ministries and two independent agencies involved in regulation of the sector

Ministry of Mines & Petroleum

	Directorate of Policy (DP)	Oil and Gas Development Sector Directorate (OGDSD)	Afghanistan Petroleum Authority (APA)	Afghanistan State Gas Enterprise (Afghan Gas)
Function	• Survey/Geo data • Policy/Governance	• Tender Contracts • Regulation-Oil • Downstream-Regulation	• Contract Management • Project Finance • Technical Services • Regulation- Oil • Natural Gas Transportation • Regulation-Natural Gas	• Survey/Geo data • Exploration/Production • Tender Contracts • Natural Gas Transportation • Field Services
Responsibilities	• Environmental Regulation • Petroleum Data	• Commercial Regulation • Attracting Investment • Petroleum Data	• Downstream Regulation • Register Contracts • Policy/Governance • Regulation-Commercial • Regulation-Environmental • Attract Investment • Petroleum Data	• Natural Gas Imports • Regulation Natural Gas • Wholesale • Pricing • Attract Investment • Petroleum Data

Ministry of Commerce & Industries

Independent Agencies

	Downstream Petroleum Regulation Department (DPRD)	Fuel Liquids Gas Enterprise (FLGE)	Afghan National Standards Authority (ANSA)	National Environmental Protection Agency (NEPA)
Function	• Pricing • Downstream Regulation • Register Contracts	• Tender Contracts • Product Imports • Testing Certification • Storage- Commercial • Transport/ Distribution	• Product Standards • Testing Certification	• Environmental regulation
Responsibilities	• Control the market • Regulated the market	• Wholesale • Retail • Pricing • Contract with Private Sector • Register Contracts	• Quality control • Environment protection • Safety of the people	

Upstream Regulation: DP, OGDSD and APA involve in upstream regulation of oil industry of which DP draft policy, OGDSD attract investment (bind contracts) and APA monitor the production process

Directorate of Policy (DP)

- Stablished in 1389 and has following departments (18 employee)
  - ✓ Hydrocarbon
  - ✓ Mineral
  - ✓ Economic
- *Responsibilities:*
  - ✓ Draft MoMP short term and long term plans
  - ✓ Draft and analyze OGDSD and APA short term plan
  - ✓ Draft policy on gas production
- *Challenges:*
  - ✓ No policy drafted for oil yet
  - ✓ Lack of coordination between DP and APA
  - ✓ Lack of skilled employee in planning
  - ✓ Lack of database in DP

Oil and Gas Development Sector Directorate (OGDSD)

- Stablished in 1392 and has following departments (14 employee):
  - ✓ Project development
  - ✓ Investment promotion
- In 1394 OGDSD will merge with mineral directorate of MoMP to make investment promotion for upstream production
- Responsibilities:
  - ✓ promotion and coordination of investment
  - ✓ Oil and gas contract tender
  - ✓ Guiding investors
  - ✓ Determining upstream oil price by collecting data from commercial
  - ✓ Providing bidding documents
- Challenges:
  - ✓ APA inquisitive on OGDSD activities
  - ✓ Lack of experts
  - ✓ Lack of coordination with relevant departments

Afghanistan Petroleum Authority (APA)

- Created in 1392 and has three department (29 employees)
- Going to change its Tashkeel to 85 employee in 1394 under these departments
  - ✓ Technical services and survey
  - ✓ Oil and gas source development
  - ✓ Contract implementation monitoring
- APA monitor three contracts:
  - ✓ Afghan Tajik basin
  - ✓ Amoo Daria basin
  - ✓ Development of gas pipeline from Mazar to Shubarghan
- Responsibilities:
  - ✓ Provide technical services such as mining development research and environmental safety measures
  - ✓ Collect royalty, analyze budgets and identify crude oil price in the market
- APA encounter following challenges:
  - ✓ Producing companies do not comply the contract procedure (they extracted oil from old well but failed to dig new one)
  - ✓ Oil and Gas Development Sector Directorate's TOR is similar to APA one

Downstream Regulation: DPRD (MoCI) and ANSA involve in downstream regulation of oil industry. DPRD monitor price and license importing companies, ANSA control import quality

Downstream Petroleum Regulation Department (DPRD)

- Created in 1391 and has two department (10 employee)
- DPRD responsibilities:
  - ✓ Issuing import licenses (issued 350 licenses to private companies)
  - ✓ Receiving quarterly report from private importers (quantity, price and cost)
  - ✓ Drafting downstream petroleum law
  - ✓ Providing oil price data for the MoCI
  - ✓ Issuing compressed natural gas licenses for private pump stations
- DPRD challenges are:
  - ✓ FLGE issue license to private distributors and control prices which is the job of DPRD
  - ✓ Companies does not import oil with DPRD licenses (import with AISA licenses)
  - ✓ Low working capacity of DPRD (personals, office equipment's and internet database)

**Note: Parallel to DPRD, FLGE also involved in downstream regulation*

Afghanistan National Standard Authority (ANSA)

- Responsibilities:
  - ✓ Control quality of commodities including petroleum in ports
  - ✓ ANSA surrendered the quality control of oil in ports to Geo-cum (private firm)
  - ✓ Drafting environmental safety law
  - ✓ Drafting law for oil refinery companies
- Service fee charged for petroleum quality check up:
  - ✓ Oil $5 per MTs
  - ✓ Gas $4 per MTs
  - ✓ Crude oil $2 per MTs
  - ✓ Lubricants $2 per MTs
- ANSA encounter following challenges in the oil industry:
  - ✓ No market quality control due to FLGE interference and political connection of oil retailers
  - ✓ High quality check up lead to more smuggling (illegal import)
  - ✓ No action plan for increase the standard level
  - ✓ Imports of low quality oil in the market with the name of exempted fuel to NATO

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Executive summary

- **FLGE operates under the supervision of the Ministry of Commerce & Industry**. With 1,767 employees, it is active in all Afghan provinces. FLGE has three main responsibilities: importing oil and gas, issuing licensing and checking the quality of oil and gas. FLGE also auctions state owned pump stations for potential bidders, lease, and rents its owned lands. Likewise, it collects revenue from repairing pump stations and storage facilities
- **FLGE generated a profit of $4.5 million (1393) on an asset base of $100 million**. Although the company does not currently import oil, it imported up to 28,000 MTs of oil/gas from Turkmenistan/Russia as recently as 1390. Now, its major source of income is leasing and renting property and pump stations to the private sector. In terms of capacity, FLGE has reservoir capacity of 221,209 MTs of oil and 16,814 MTs of gas. It owns 90 operational pump stations and maintains a truck fleet of 94 trucks (with a transport capacity of 1,130 MTs per day)
- **We recommend FLGE to be the only importer of oil and gas sector to the country**. This will ensure that we maintain high quality fuel supplies to Afghan military and government forces. We would then provide for a licensing regime for firms that want to participate in the wholesale and retail distribution of oil and gas
- **In addition, we recommend the formation of a strategic oil national strategy**. To explore the possibility of building national reserves, we held a conference call with the U.S. Department of Energy (DOE) to begin discussing the potential Afghanistan to begin developing its reserves. An initial assessment points to a national reserve of 350,000 MTs, built over 5 years, at a total cost of ~USD$150 million. Current oil reserve capacity (if all facilities were operational) is estimated at 400,000 MTs, implying that no new facilities would need to be constructed
- **Such reserves would represent 30 days of annual consumption and more than a year's worth of combined MoD and MoI annual consumption of fuel (217,042 MTs)**. Currently, MoD/MoI has oil storage capacity of 23,888 MTs (11% of its annual consumption).

Fuel Liquids Gas Enterprise (FLGE) is a state-owned company that resells oil and gas products throughout Afghanistan

FLGE Real Assets

Land	Owns 1,025 Jereeb land
Storage Facilities	The company has 238,023 MTs of oil reservoirs: 161,754 MTs of operational reservoirs + 59,455 MTs non-operational reservoirs + 16,814 MTs of new bullet-proofed gas reservoirs
Employees	The company has 1,767 employees: 782 permanent and 985 contractual
Trucks	FLGE owns 94 trucks: 44 V-10 tankers + 50 Kamaz tankers
Pump-stations	The company has 94 operational pump stations of which 16 are in Kabul. In each province FLGE directly operates one station

FLGE Financial Summary

Revenue	Direct revenue from sales of oil & gas, indirect revenue from lease of land, pump-stations, social service
Income	The company earned profit of USD$4.5 million in 1393 – placing it amongst the most profitable Afghan SOEs
Expenses	USD$9 million in 1393 including salary of employees and oil distribution expenses
Asset	The company has USD$100 million in total assets
Cash	The company has generated negative cash flows during the past two years

FLGE imports oil and gas through MoCI requests – however, the company has only imported a total 28,000 MTs of oil and gas during the past four years. The largest country of origin for imports is Turkmenistan

The existing process FLGE procures its oil & gas through MoCI

- FLGE sends a request the quantity import to MoCI and the ministry processes the request letter for approval from the Office of the President
- A committee of representatives from MoCI, MoF, & procurement travel to the importing countries for oil purchase
- The committee evaluate the options to buy from contractors or spot market
- Through an open bidding, the committee selects an importing company
- The contractor is obliged to transport the fuel to Hairatan port, and FLGE trucks deliver the oil to reservoirs and consumers

Note: FLGE has 38 laboratories for checking the quality of imported oil and gas but they are used in Kabul, Mazar, Herat and Pulkhmri

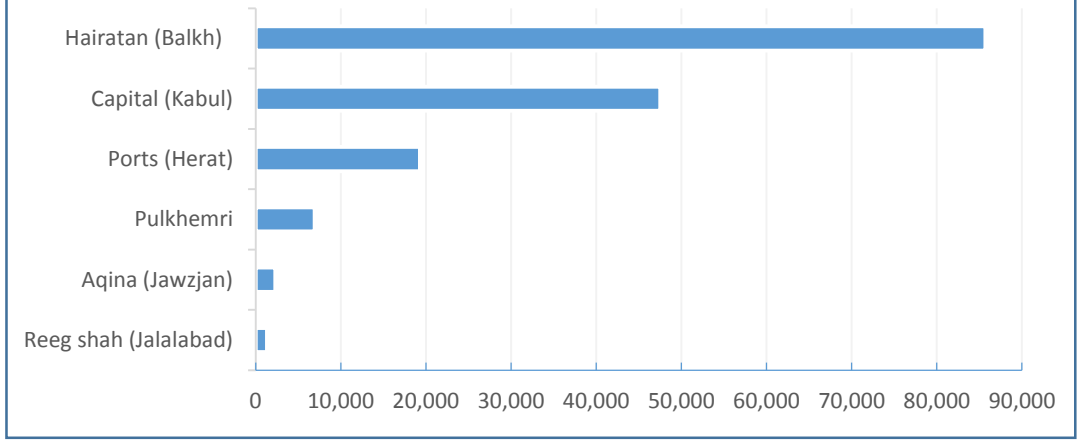
FLGE imported 20,000 MTs oil and gas in 1390 and 8,000 MTs of gas in 1393

	1390	1391	1392	1393
Source	• Gazprom • Watangas • Sarwary	-	-	• Turkmnangaz • Turkmanbashi • Mohmd jalal
Type	Diesel, liquid gas	-	-	Liquid gas
Amount (MTs)	• 10,000 (diesel) • 10,000 (gas)	-	-	8,000

**Note: no fuel or gas was imported in 1391 and 1392. All domestic companies supply from Turkmenistan*

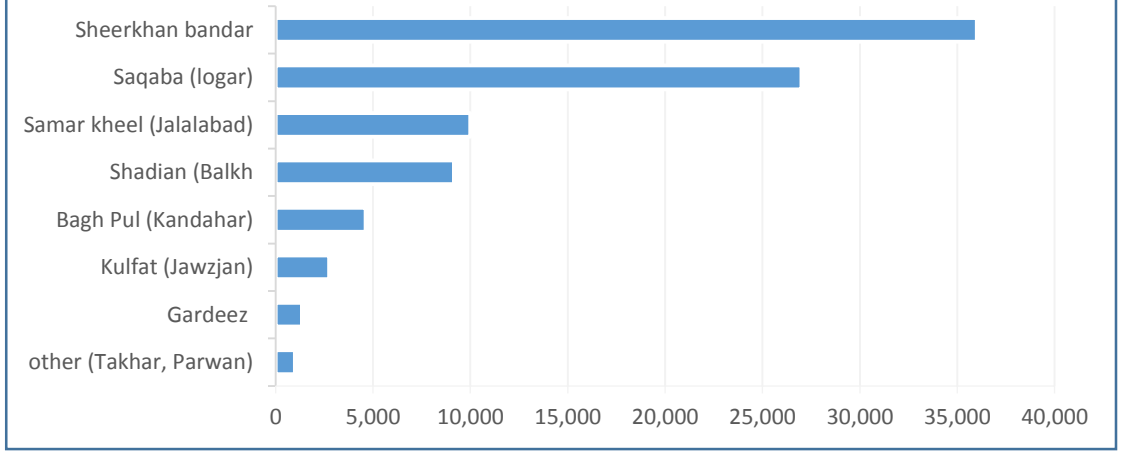
FLGE has 222,559 MTs of oil reserve capacity (163,104 MTs operational and 59,000 MTs non-operational) and 16,814 MTs of gas reserve capacity. The company also has a fleet of 94 trucks (daily transport capacity = 1,130 tons per day)

Oil: 163,104 MTs of operational reservoirs



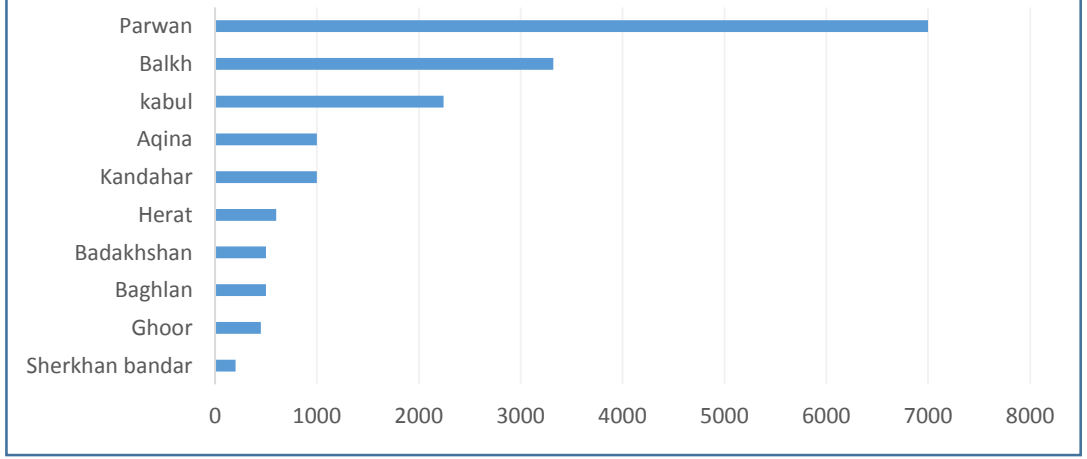
Note:. 3 facilities located in each of these provinces: Balkh, Kabul and Herat

Oil: 59,455 MTs of non-operational reservoirs



Note: approximately $15 million needed to fix non-operational reservoirs

Gas: 16,814 MTs of storage facilities



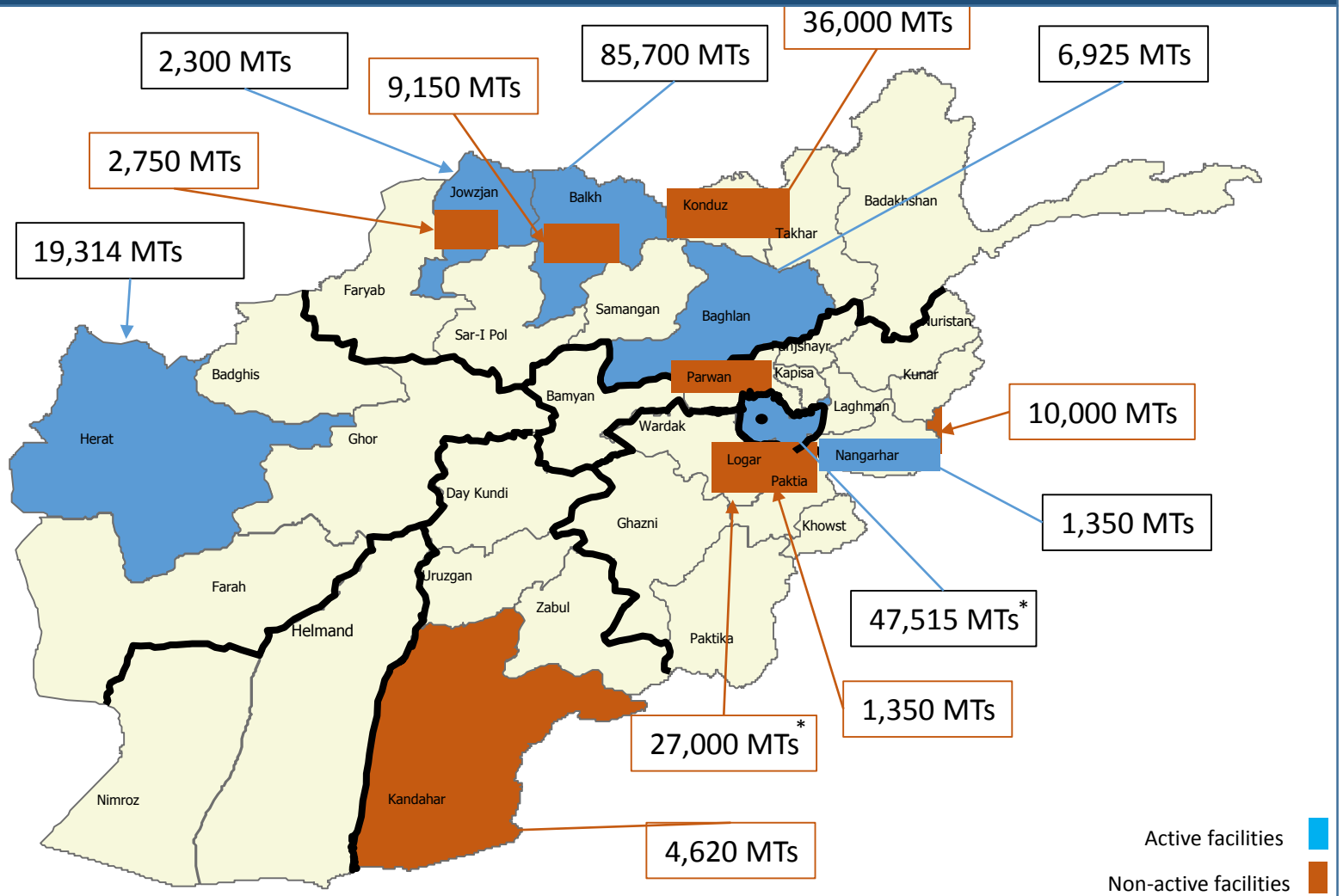
**Note: 2 facilities located balkh: Hairatan (1000MTs), Mazar (2,320MTs)*

FLGE has a fleet of 94 oil & gas transporting trucks

- Total truck fleet capacity is 1,130 MTs per day
- FLGE has a total of 94 trucks: 44 V10s + 50 Kamaz trucks
- 97 drivers operate the trucks
- V-10s have a capacity of 14 MTs of oil
- Kamaz trucks have the capacity of 10 MTs of oil
- FLGE has also an equipped maintenance garage in Kabul

FLGE has oil reserve capacity is centered in the central, western, and northern parts of Afghanistan. We lack reserve capacity in the south of the country, and also have six non-operational reserve areas

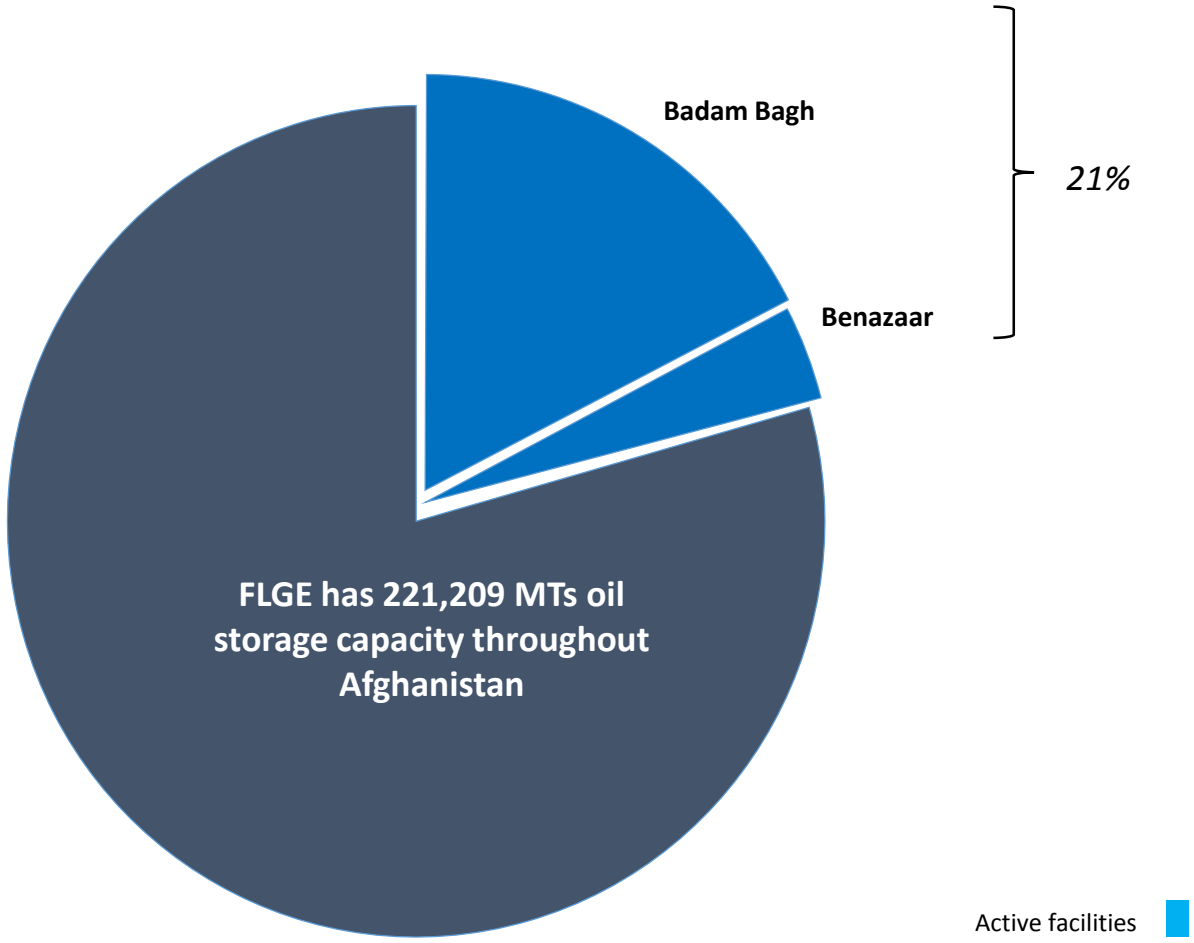
Operational reserves are shown in blue, while non-operational reserves are shown in orange



** Denotes locations that we have visited*

FLGE has two oil storage facilities in Zone 1 (Kabul), with a combined capacity of 47,515 MTs of oil (21% of total FLGE capacity)

21% of FLGE's oil storage facilities are located in Kabul: Benazar and Badam Bagh



Badam Bagh : 41,615 MTs capacity

Type	# tanks	Capacity
Diesel	4	5 million
Petrol	4	5 million
Lubricant	45	75,000
Other	6	75,000

- *Land*: 45 jireebs
- *Scales*: 2 (each 30 MTs)
- Stations
  - *1 manual loading stations*
  - *1 auto loading station*

Benazaar : 6,000 MTs capacity

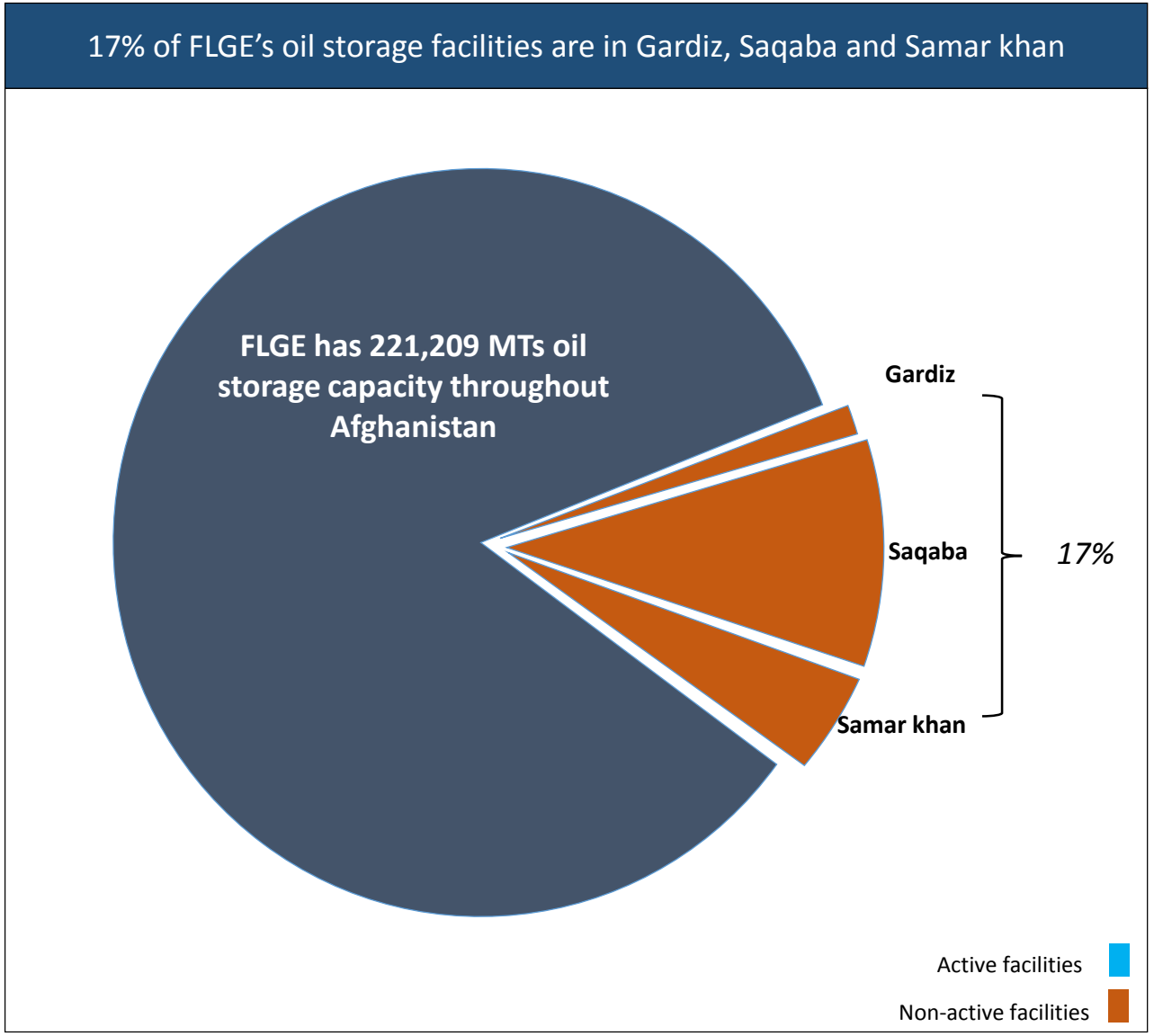
Type	# tanks	Capacity
Diesel	50	70,000
Petrol	6	400,000
Lubricant	4	75,000
Other	2	75,000

- Land: 50 jireebs
- Employees: 36
- Warehouses: 5
- Scales: 2 (60 MTs capacity each)
- Stations: 1 manual loading
- Other
  - 1 fire fighting trucks
  - 3 water well
  - 94 trucks

**Note: Capacity is in liters*

FLGE has 3 non-active oil storage facilities in Zone 2 (southeast), with a combined capacity of 39,350 MTs of oil (17% of total FLGE capacity)

17% of FLGE's oil storage facilities are in Gardiz, Saqaba and Samar khan



*Note: Parwan storage facility (400 MTs) is not shown as it is the only facility located in Zone 3

Gardiz :1,350 MTs capacity		
Location	# tanks	Land
Paktia	18	10

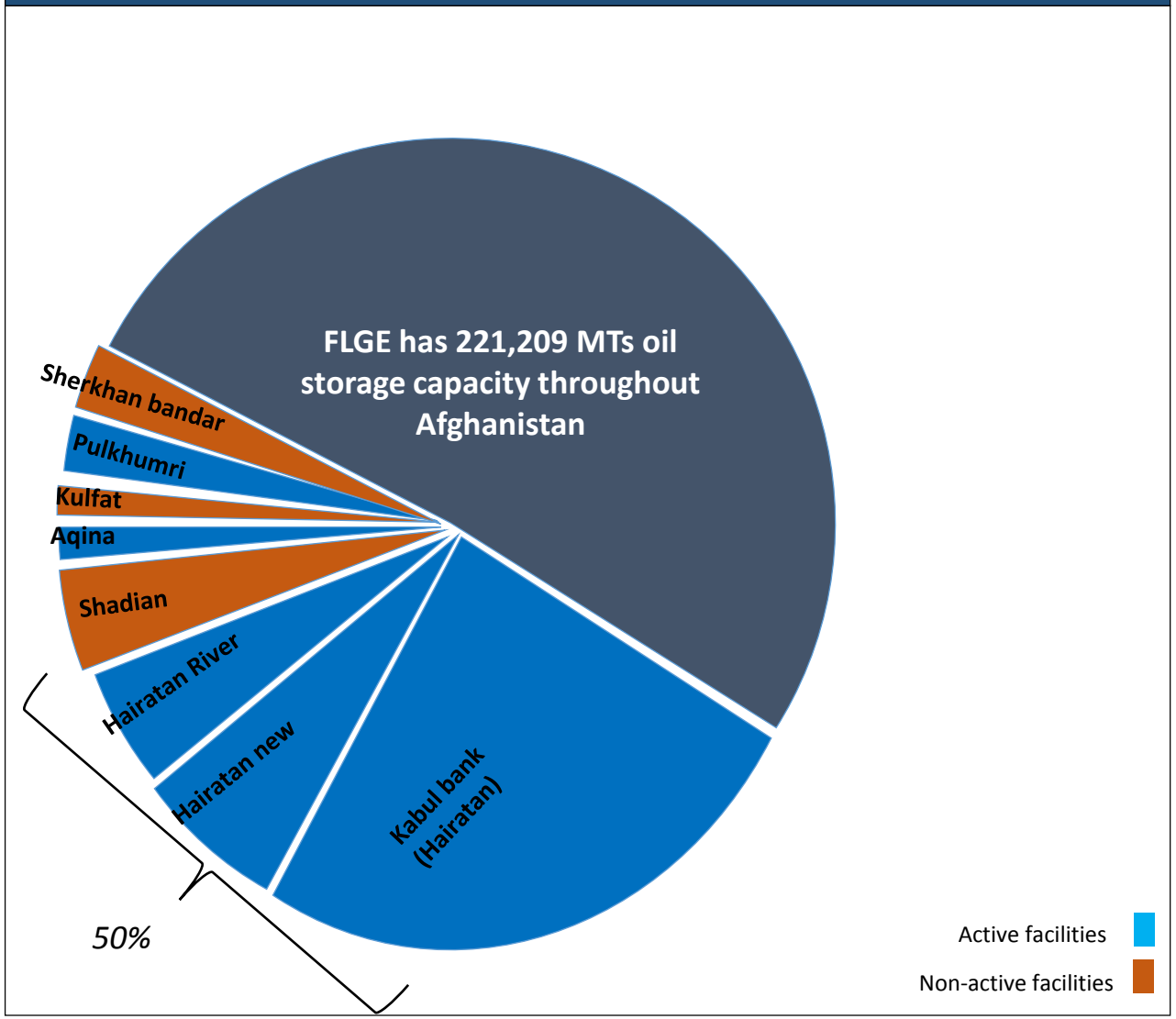
Saqaba : 27,000 MTs capacity		
Location	# tanks	Land
Logar	9	74

Samar khan : 10,000 MTs capacity		
Location	# tanks	Land
Nangarhar	2	11

Note: land area in Jereeb

FLGE has 6 active oil storage facilities and 4 non-active in Zone 4 (North), with a combined capacity of 111,010 MTs of oil (50% of total FLGE capacity)

50% of FLGE's oil storage facilities are in Balkh, Jawazjan, Baghlan and kunduz



*Note: The Takhar storage facility (585 MTs) is not shown in the graphic due to its small size

Balkh : 94,850 MTs capacity

location	# tanks	Capacity
Kabul bank	12	61,000
Hairatan new	17	15,500
Hairatan river	61	9,200
Shadian	3	9,150

- *Land: 77 Jireeb*
- *Scale: 4 (60 MTs each)*

Jawzjan : 5,050 MTs capacity

location	# tanks	Capacity
Aqina	6	2,300
Kulfat	18	2,750

- *Land: 540 Jireeb*
- *Scale: 2 (60 MTs each)*

Baghlan: 6,925 MTs capacity

location	# tanks	Capacity
Pulkhumri	7	6,925

- *land:34 Jireeb*
- *Scale: 2 (60 MTs each)*

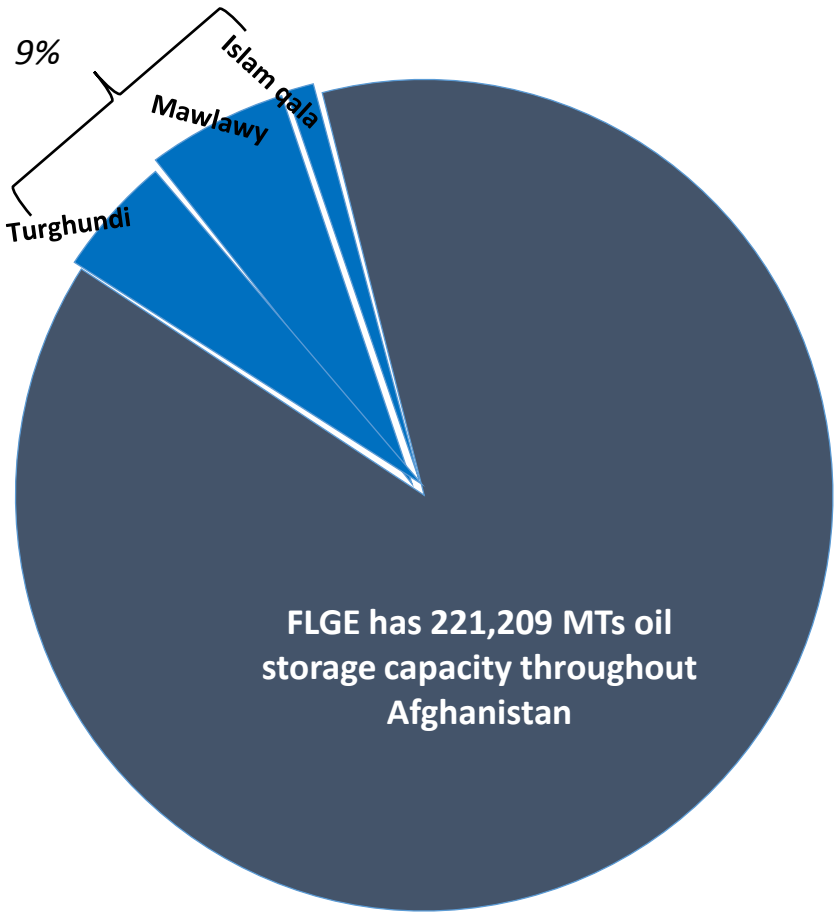
Kunduz: 4,185 MTs capacity

location	# tanks	Capacity
Sherkhan bandar	22	3600
Takhar	9	585

- *land: 62 Jireeb*
- *Scale: 2 (60 MTs each)*

FLGE has 3 active oil storage facilities in Zone 5 (west), with a combined capacity of 19,340 MTs of oil (9% of total FLGE capacity)

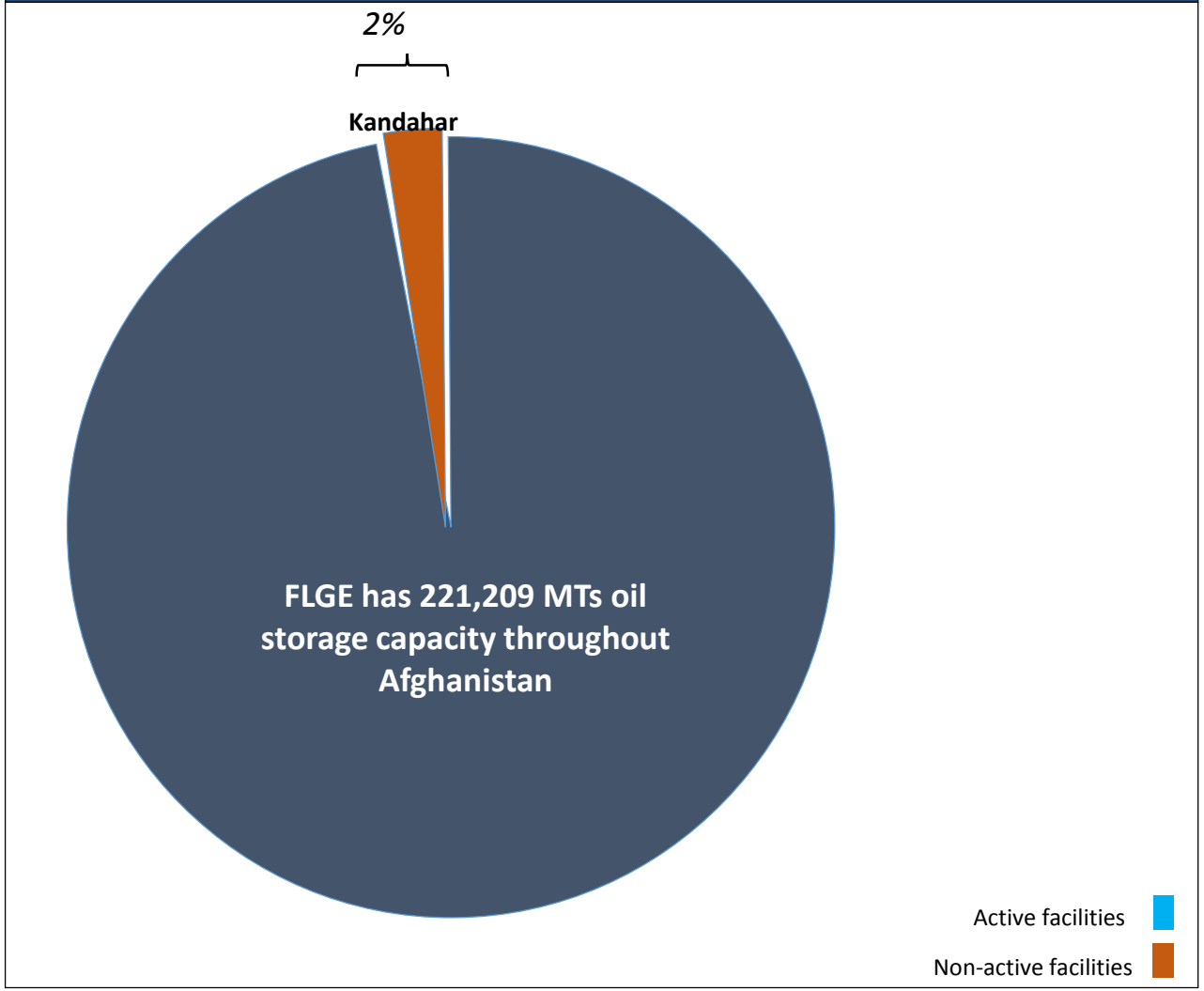
9% of FLGE's oil storage facilities are located in Herat



Herat : 19,314 MTs capacity			
Location	# tanks	Capacity	• *Land :130 Jireeb* • *Scale: 3 (60 MTs each)*
Mawlawy	112	9,610	
Turghundi	3	9,034	
Islam qala	11	670	

FLGE has 1 non-active oil storage facilities in Zone 6 (south), with a capacity of 4,620 MTs of oil (2% of total FLGE capacity)

2% of FLGE's oil storage facility is located in Kandahar



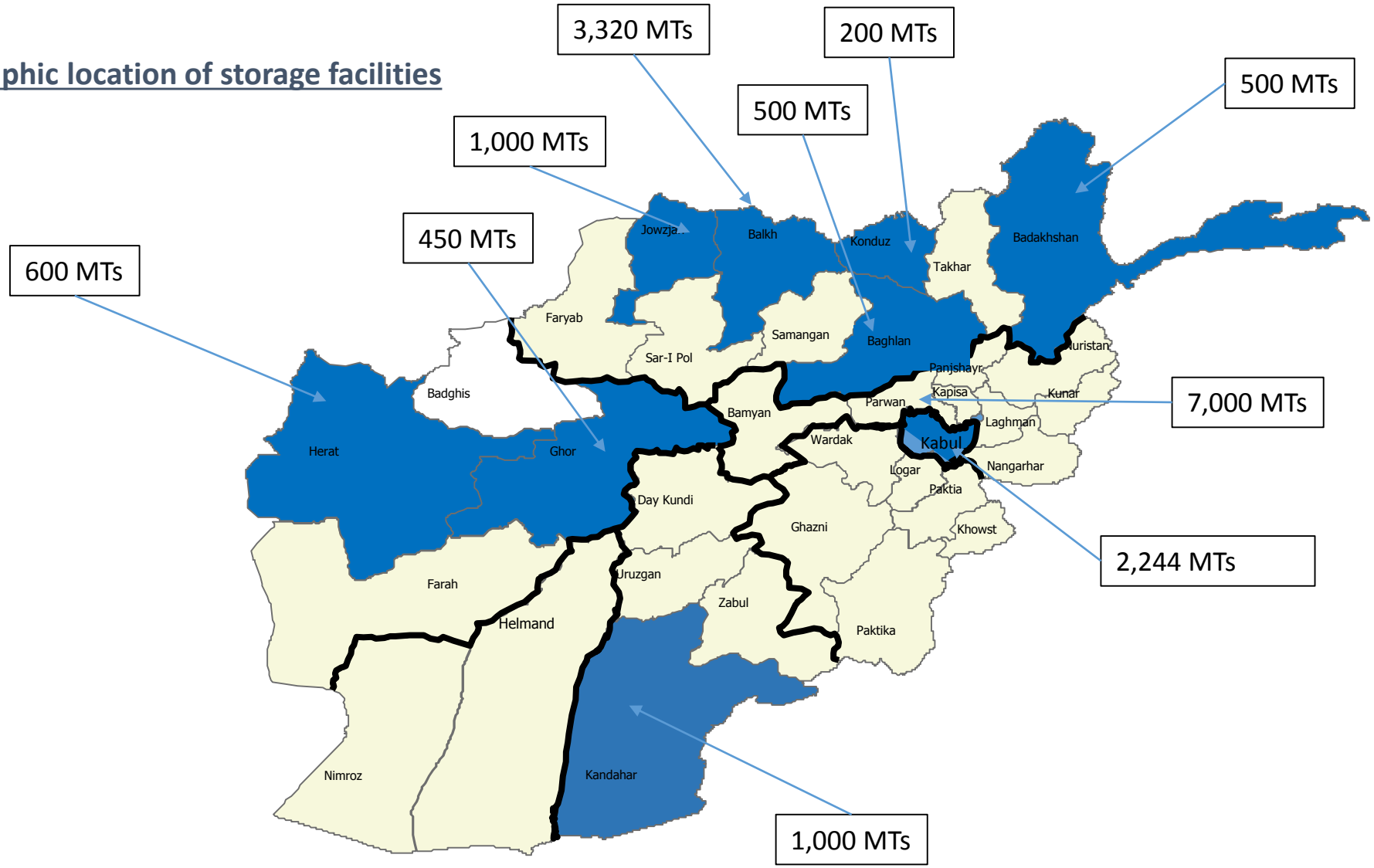
Kandahar : 4,620 MTs capacity

Location	# tanks	Capacity
Zakhira bagh	154	4,620

- *land:21 Jireeb*
- *Scale: 1 (60 MTs each)*

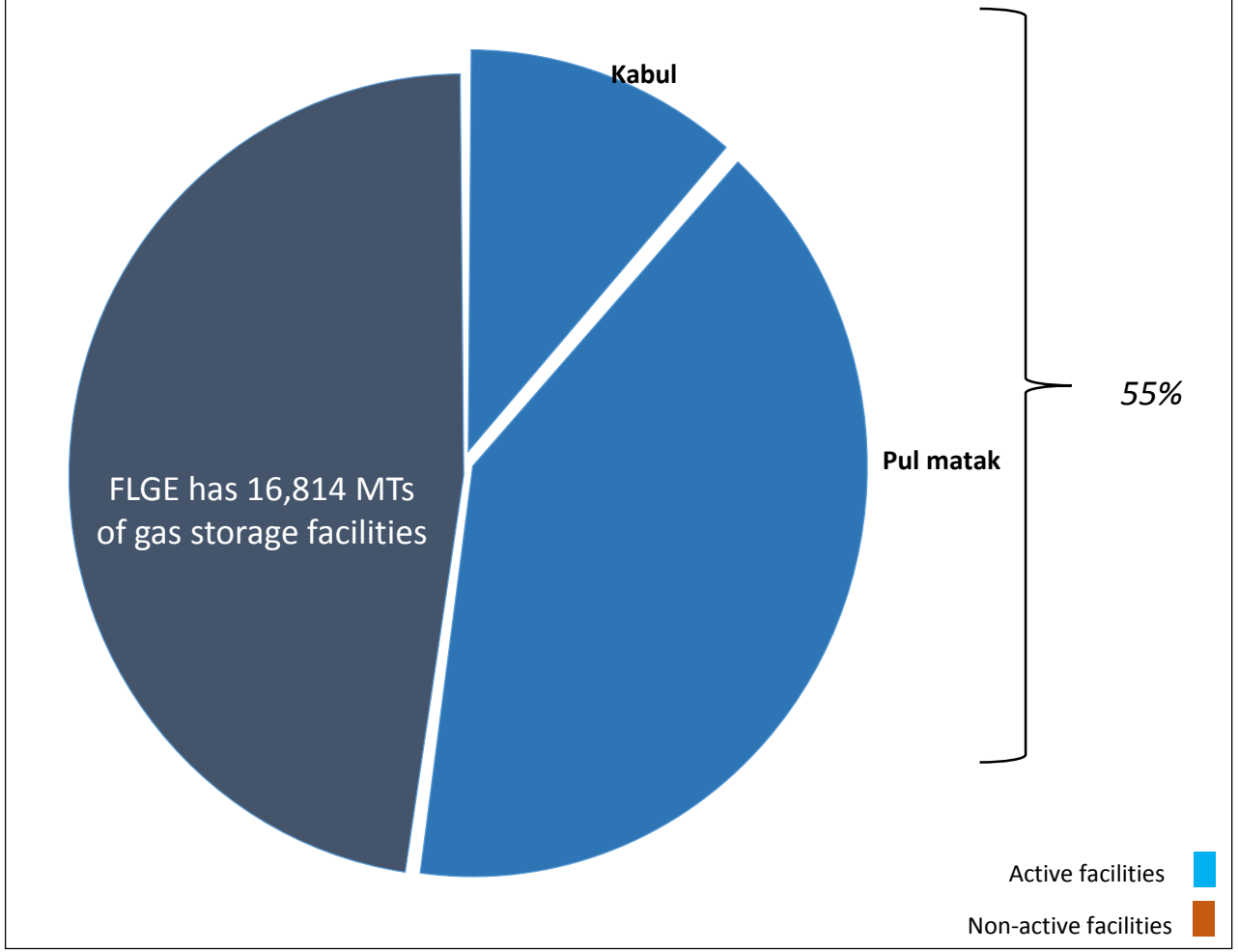
FLGE has 16,814 MTs of gas reserve capacity is centered in the central, western, and northern parts of Afghanistan. We lack reserve capacity in the south and east of the country

Geographic location of storage facilities



FLGE has two gas storage facilities in Zone 1 & 3 (Kabul and Parwan), with a combined capacity of 9,244 MTs of oil (55% of total FLGE gas capacity)

55% of FLGE's gas storage facilities are located in Kabul and Parwan



**Note: 2000 MTs of Parwan facilities are active and 5000 is under construction*

Kabul: 2,244 MTs of gas storage facilities

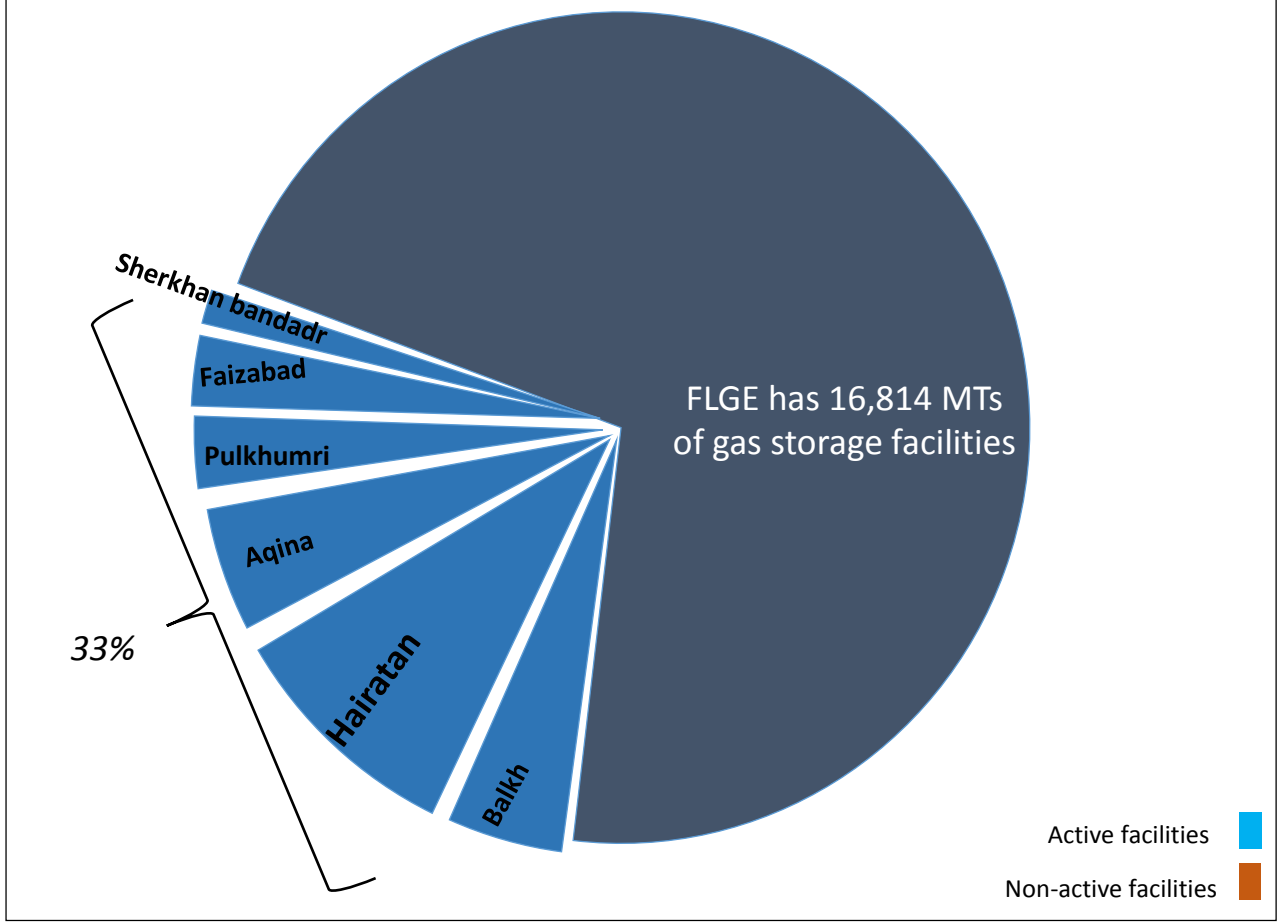
Type	# Tank	Capacity	• 240 Jereeb • 20 gas distributing stations • 2 scales, each 60 MTs capacity • 1 control station • 2 fire fighting trucks • 1 water pool
Gas	35	60	

Parwan: 7,000 MTs gas storage facilities

Type	# Tank	Capacity	• 54 Jereeb • 20 scale each 60 tons • 1 auto loading station • 32 gas distributing stations • 1 control station • 1 fire fighting trucks • 1 water pool
Gas	122	60	

FLGE has 6 active gas storage facilities in Zone 4 (north), with a combined capacity of 5,520 MTs of oil (33% of total FLGE gas capacity)

33% of FLGE's gas facilities are located Balkh, Jawzjan and other



*Note: 2000 MTs of Parwan facilities are active and 5000 is under construction

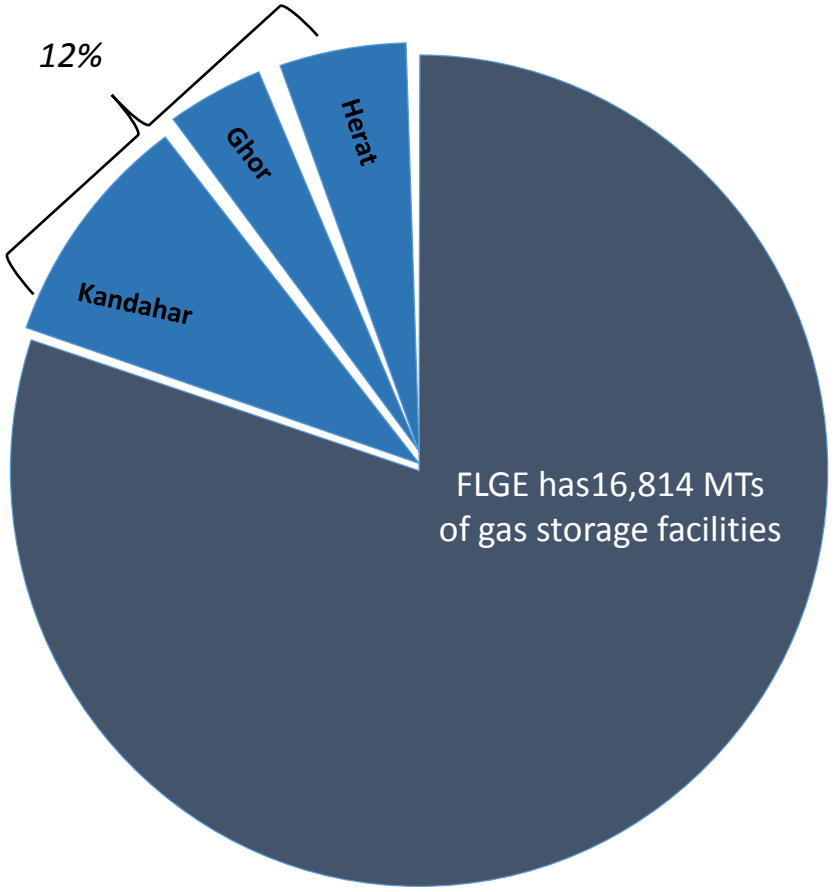
Balkh: 3,320 MTs of gas storage facilities			
location	# Tank	Capacity	• 18,600 Jereeb in Balkh • 6 Jereeb in Hairatan
Balkh	17	10,000	
Hairatan	47	2,320	

Jawzjan: MTs gas storage facilities			
Type	# Tank	Capacity	• 20 Jereeb in Jawzjan • 18 Jereeb in other
Aqina	17	1,000	
Other	22	1,200	

*Note: pulkhumri, faizabad and sherkhan bandar added as other

FLGE has 3 active gas storage facilities in Zone 5 & 6 (west, south), with a combined capacity of 2,005 MTs of oil (12% of total FLGE gas capacity)

12% FLGE's gas facilities are located in Herat, Kandahar and Ghor



*Note: 2000 MTs of Parwan facilities are active and 5000 is under construction

Kandahar: 1,000 MTs of gas storage facilties			
Type	# Tank	Capacity	• 20 Jereeb
Gas	17	1,000	

Herat: 1,050 MTs gas storage facilities			
Type	# Tank	Capacity	• 3,000 Jereeb in Herat • 4,800 Jereeb in Ghor
Herat	25	600	
Ghor	10	450	

FLGE has a total of 180 distribution centers: 110 pump stations, 70 small retail distribution centers, and 10 gas distribution trucks. Most the pump stations are located in Kabul, Herat and Baghlan

Number and location of FLGE oil distribution stations (by province)

Geographic location of pump stations

**Note: FLGE also controls private pump stations in terms of sales quantity and price*

FLGE has 100 pump-stations

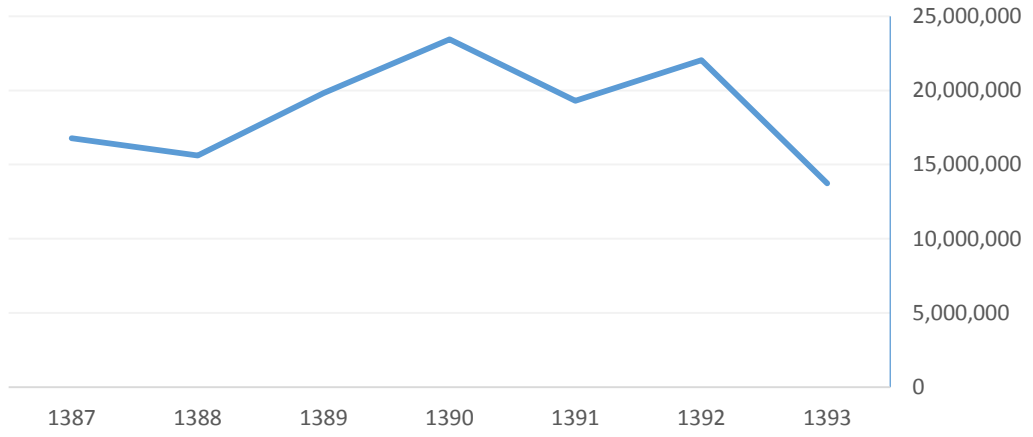
- Kabul: 16
- Heart: 16
- Baghlan: 12
- Kandahar, Balkh & Kunduz: 5 each
- Farah: 4
- Paktia, Nangarhar, Laghman, Ghazni, Hairatan, Bamian and Parwan: 3 each
- 16 other provinces: 1 each

FLGE has retail distribution centers and gas distribution trucks

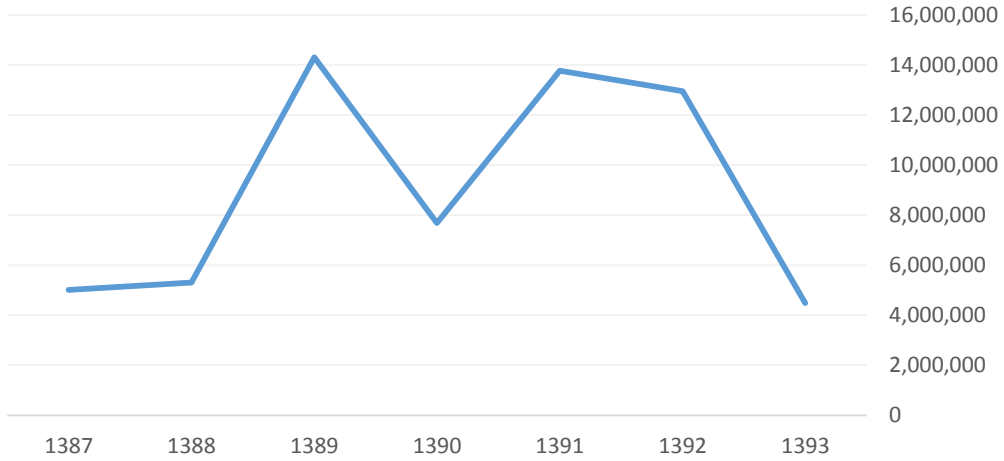
- Owns 60 retail distribution centers in Kabul for selling gas
- 10 distribution centers in Herat, Pulkhemri and Balkh
- 10 gas distributing trucks only in Kabul
- FLGE supply gas to 12 government organizations

FLGE has been a relatively profitable company over the past six years

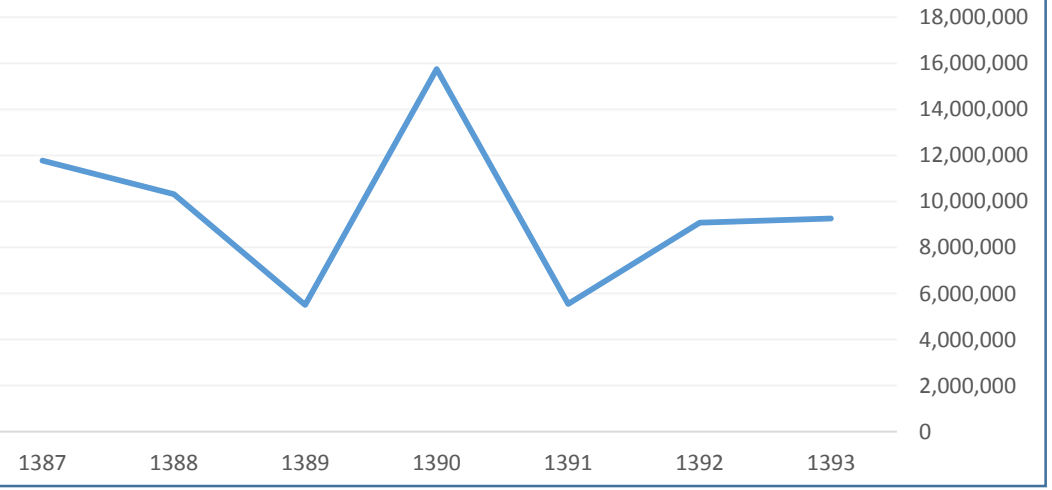
Total revenues have sharply decreased to $14 million in 1393



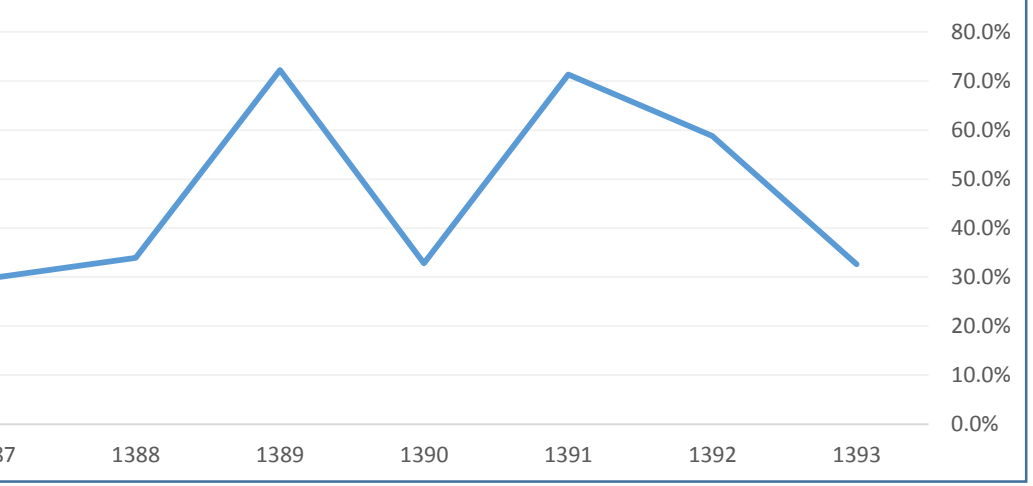
Net income declined to almost $4 million in 1393



Expenditures have been flat at around $8-10 million



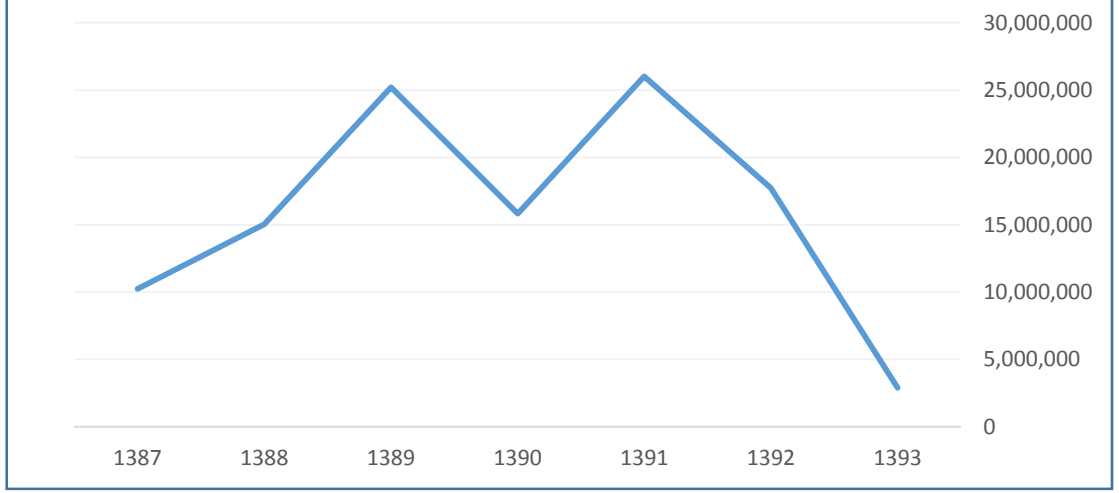
Profit margin has ranged between 30-60%



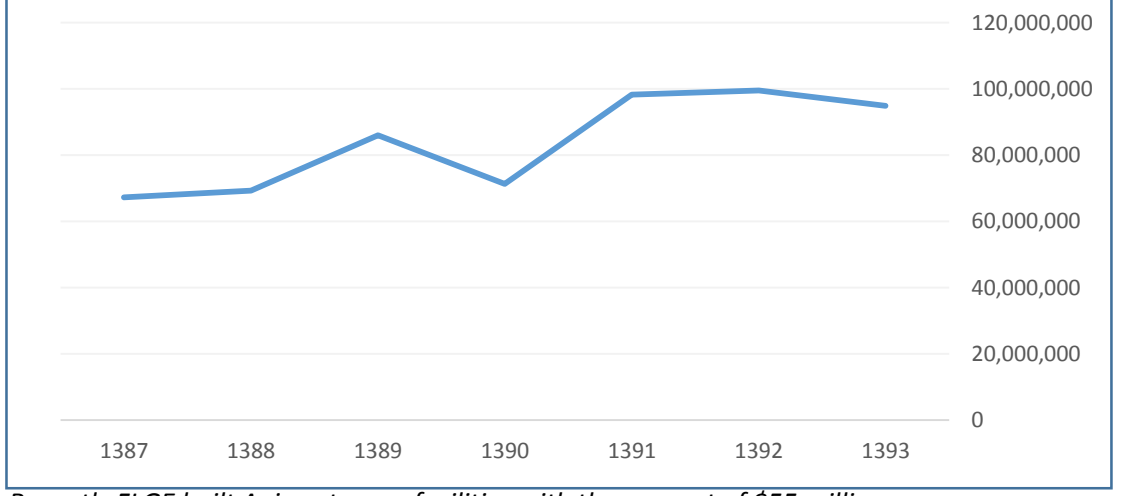
**Note: all figures are in USD*

Total assets and total equity have remained relatively flat, while cash dropped significantly in 1393

Total cash sharply reduced below $4 million in 1393, as cash was spent for new reservoirs construction near Kabul

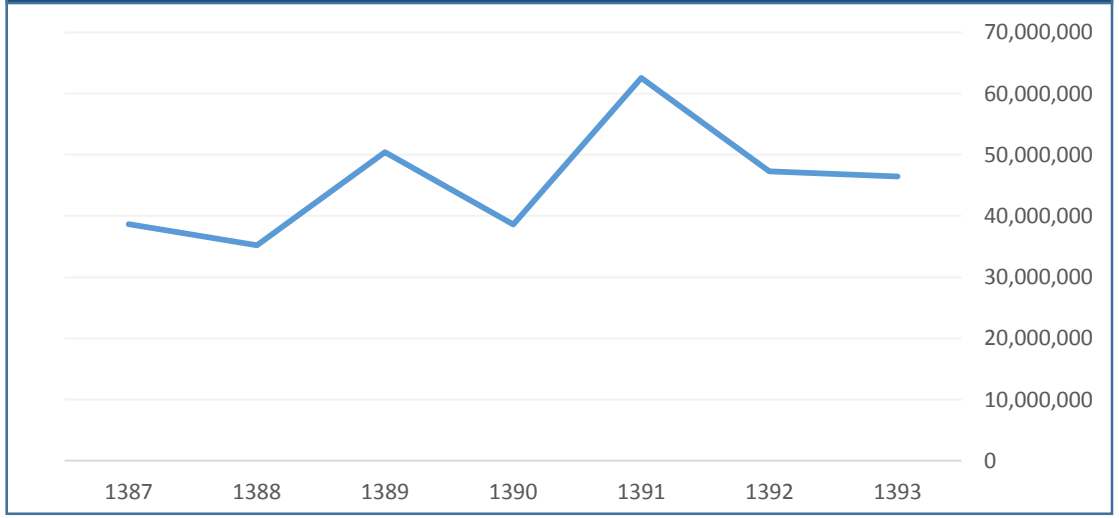


Total asset has remained flat in the $94-100 million range

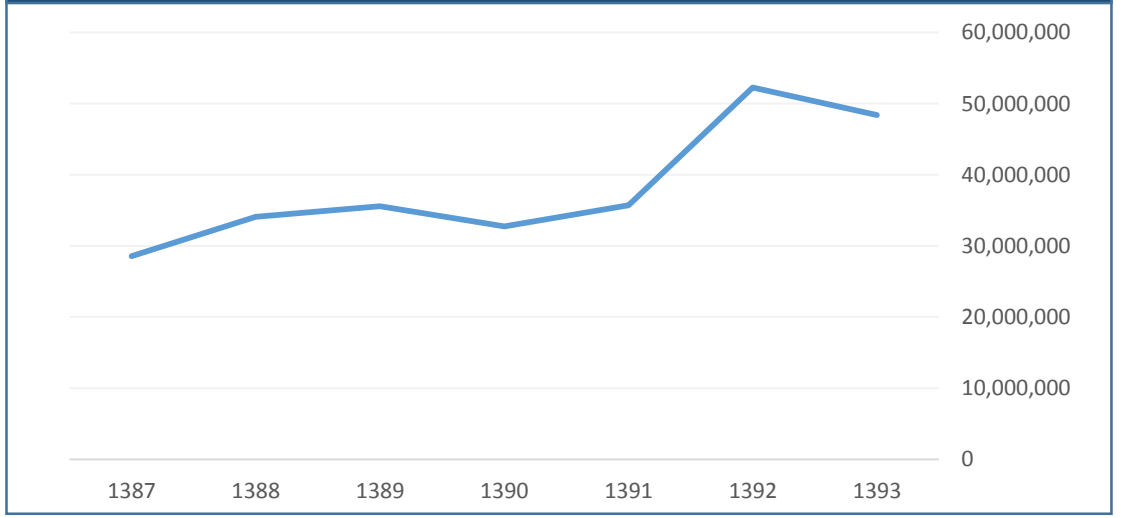


Recently FLGE built Aqina storage facilities with the amount of $55 million

Total liability is flat at the range of $46-47 million



Total equity reached $48 million in 1393



**Note: all figures are in USD*

Almost all FLGE revenue is from indirect revenue, while its cost base was 68% of its total revenue in 1393

99% of FLGE revenue came from indirect revenue in 1393

Direct Revenue
- 1% of total revenue
- Sale of oil and gas to government offices

Indirect Revenue
- 99% of total revenue
- Collect commission from distributors (*FLGE charges AFN0.02 per liter*)
- Collect 2% port service fees such as scaling fees, unloading fees and safeguarding fees

Other Major Sources of Revenue
- Reservoirs rental
- Building rental
- Land lease

59% of all FLGE expenditures were for salary and office expenses

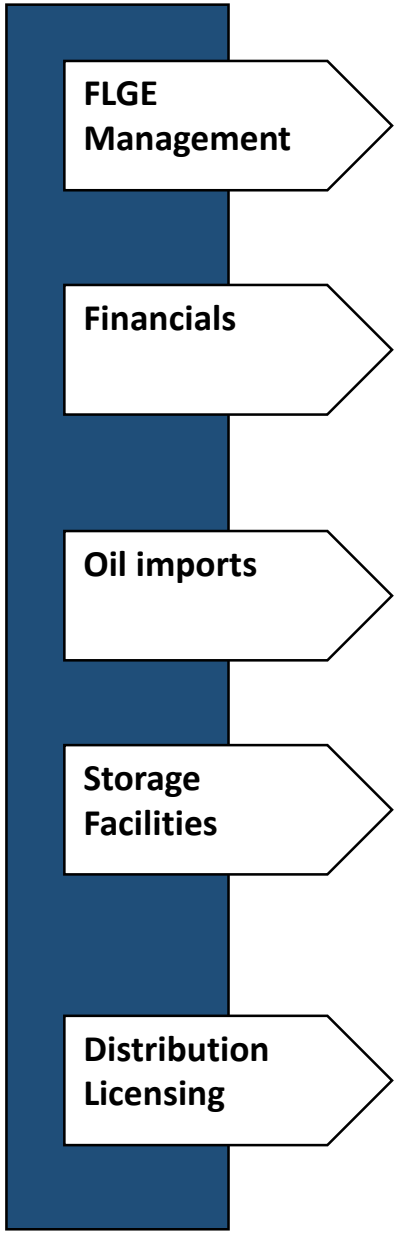
Salary expenses *(39% of total revenue)*
- Basic
- Over time
- Expert
- Seasonal
- Allowance

Office expenses *(20% of total revenue)*
- Vehicle fuel
- Travel
- Electricity
- Security

Other Expenses *(9% of total revenue)*

**Note: pump station fees are missing in IS*

To improve operations, we recommend changes in the following 5 areas of FLGE



	Challenges	Recommendations
FLGE Management	▪ Management does not have sufficient operating experience ▪ Organizational structure is too complicated ▪ Lack of IT system	▪ Replace CEO. Hire an international advisor ▪ Create a revised organizational structure (see next page) ▪ Computerize HR, procurement and finance systems ▪ Replace current retiring staffs with young professionals
Financials	▪ Generates net income of $4.5 million (1393) ▪ Has strong balance sheet, with $100 million in assets	▪ Use capital reserves and borrow additional funds to rehabilitate FLGE's 59,000 MTs of non-operational reserves
Oil imports	▪ FLGE currently don't import oil ▪ Lack of fund for import ▪ Inability to transport	▪ FLGE should purchase fuel independently of MoCI, and the company's performance should be judged by the gross margin on fuel purchases
Storage Facilities	▪ There is currently no oil stored in any of FLGE's 221,209 MTs of capacity ▪ Gas storage is almost 50% filled: 8,000 tons of gas stored versus 16,800 tons of capacity	▪ Repair 59,000MTs of FLGE's non-operational oil storage facilities at a cost of $10M million ($450/MT to build new storage and $170/MT to repair existing facilities) ▪ Begin purchasing oil at discount from Turkmenistan and Azerbaijan refineries and storing at FLGE facilities
Distribution Licensing	▪ There is currently no licensing regime for distributing oil and gas	▪ Create a bidding process to license off ~25 wholesale licenses for firms to distribute oil and gas throughout the country ▪ Do not license retail distribution

Contents

To build a strategic petroleum reserve, let us first examine the benefits, costs, and implementation issue

Benefits

Greater oil security

- Afghanistan experienced an oil shock in 2012 when Iran stopped oil exports for a period of a few days. An oil reserve would help mitigate similar oil supply shocks
- For ANSF, the government would like to ensure adequate oil supplies during military operations

Greater negotiating power

- Maintaining oil reserves will ensure that neighboring countries cannot exert undue influence over Afghanistan over oil issues

Costs

Total Costs

- We estimate total costs to be $190M over 5 years
- This cost includes $120M for the purchase of oil
- $55M for transportation and operational cost
- $15M for the rehabilitation of FLGE's 55,455 MTs of non-operational oil storage facilities (at a cost of $260 per MT)

Typical above ground facility costs

- Costs for the tank farm, storage tanks and truck loading average $29-$37 per barrel

Typical underground facility costs

- Costs, including for complex evacuation operations, average $15-$31 per barrel

- For underground facilities, approximately 75%-80% of the set up cost is for purchasing oil

Implementation Issues

Operation costs

- Total operating cost for the strategic reserves are estimated to be $7.7 million per year (*assuming operating costs are ~$22 per MTs/ year*)

Comingling oil stocks

- Comingled with commercial stock eliminate refreshment costs

Product Refreshments

- Products refreshment cost due to quality loss (~$1 per MTs/ year)

- Refreshment cost depend on the price of new oil products

*Source: EIA Strategic Petroleum Reserve Report (2015)

USA, Japan, China and India have a combined capacity of 1.2 billion barrels of underground crude oil reserves

U.S.A

USA invested $25.7 billion for 90 days strategic crude reserves (capacity of 713 million barrels). The reservoirs are built in four site with deep underground storage caverns. Crude oil stored in the SPR is currently about 40% sweet and 60% sour

Japan

Japan state controlled strategic reserves are at eleven different locations with the capacity of 323 million barrels. The Japanese SPR is run by the Japan Oil, Gas and Metals National Corporation

China

China built 91 million barrels strategic petroleum reserves (14 days consumption) with the cost of $357 million. China's SPR built in three phases which managed China National Petroleum Corporation.

India

India invested $338 million, its strategic oil reserves has capacity of 37 million barrels of crude oil for 10 days consumption. Crude oil stored in three different underground locations, The Indian Strategic Petroleum Reserves Ltd manage SPR facilities

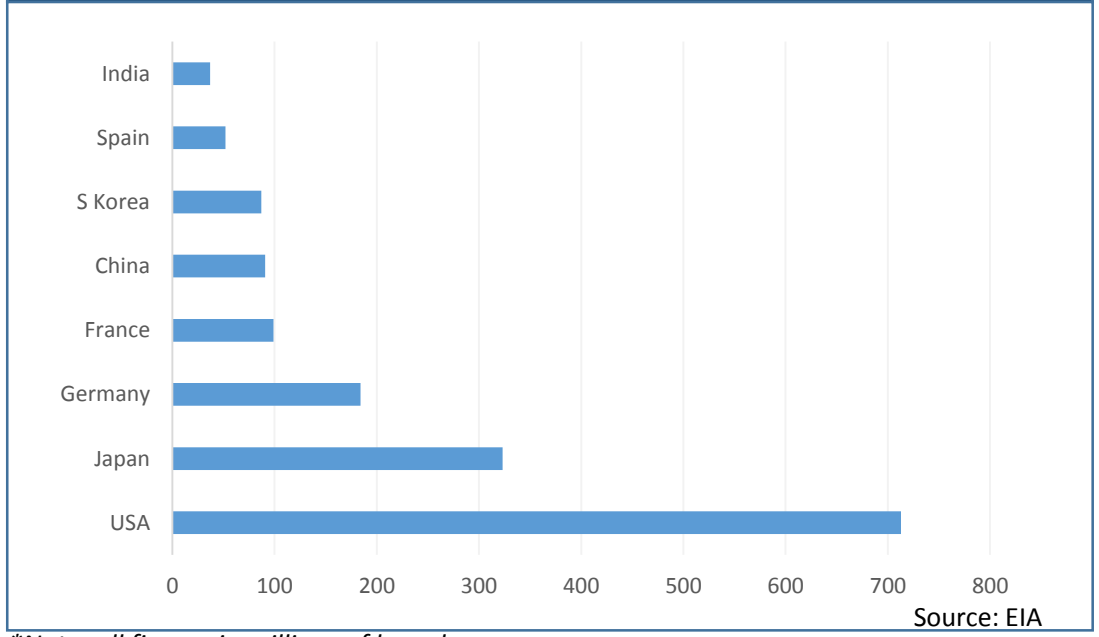
We recommend that Afghanistan develops a national strategic oil reserve of 350,000 MTs (equivalent to 30 days of use). We estimate the cost to be $150M over five years

Afghanistan needs 350,000 MTs of strategic oil reserves for 30 days

Reserve location	Planned quantity	# Needed tanks
Kabul	100,000	1,000
Herat	60,000	600
Balkh	50,000	500
Jawzjan	40,000	400
Jalalabad	30,000	300
Kunduz	25,000	250
Pulkhmumri	20,000	200
Parwan	15,000	150
Kandahar	10,000	100
TOTAL	**350,000**	3,500

**Note: Afghanistan's daily oil consumption is 10,959 MTs*

USA and Japan have the largest public strategic oil reserves



**Note: all figures in millions of barrels*

Afghanistan could seek support from the OECD, IEA, and the U.S. DOE for assistance in building its strategic reserves

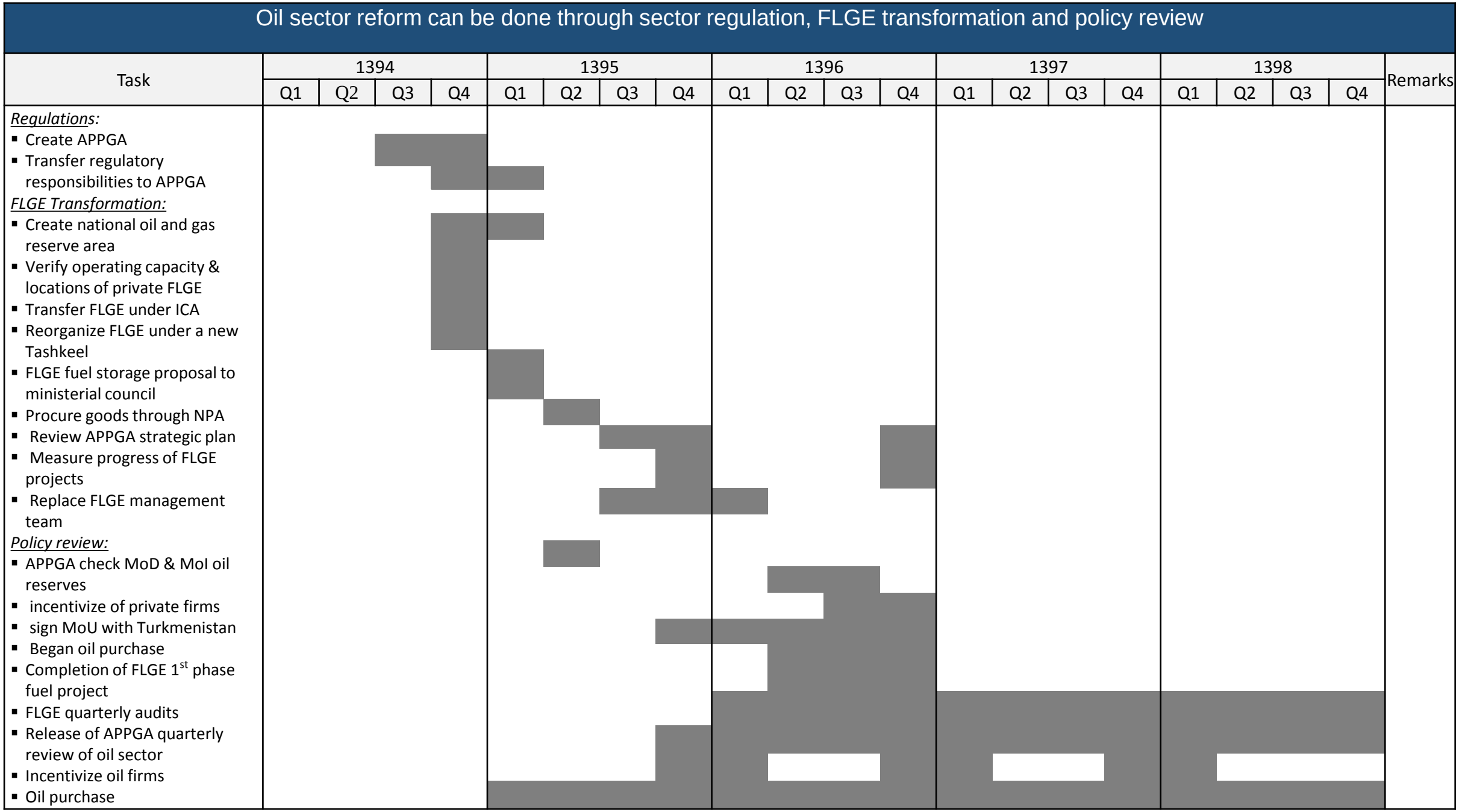
- The Global Relations Secretariat (GRS) develops and oversees the strategic orientations of OECD's global relations with non-Members.
- Helping improve public governance and management of Potential Candidates countries, Afghanistan could get benefit of the OECD Support for Improvement in Governance and Management (SIGMA) program

To build a national oil reserve, we recommend that we take five years to build a reserve of 350,000 MTs and to split the the country into seven national oil reserve areas

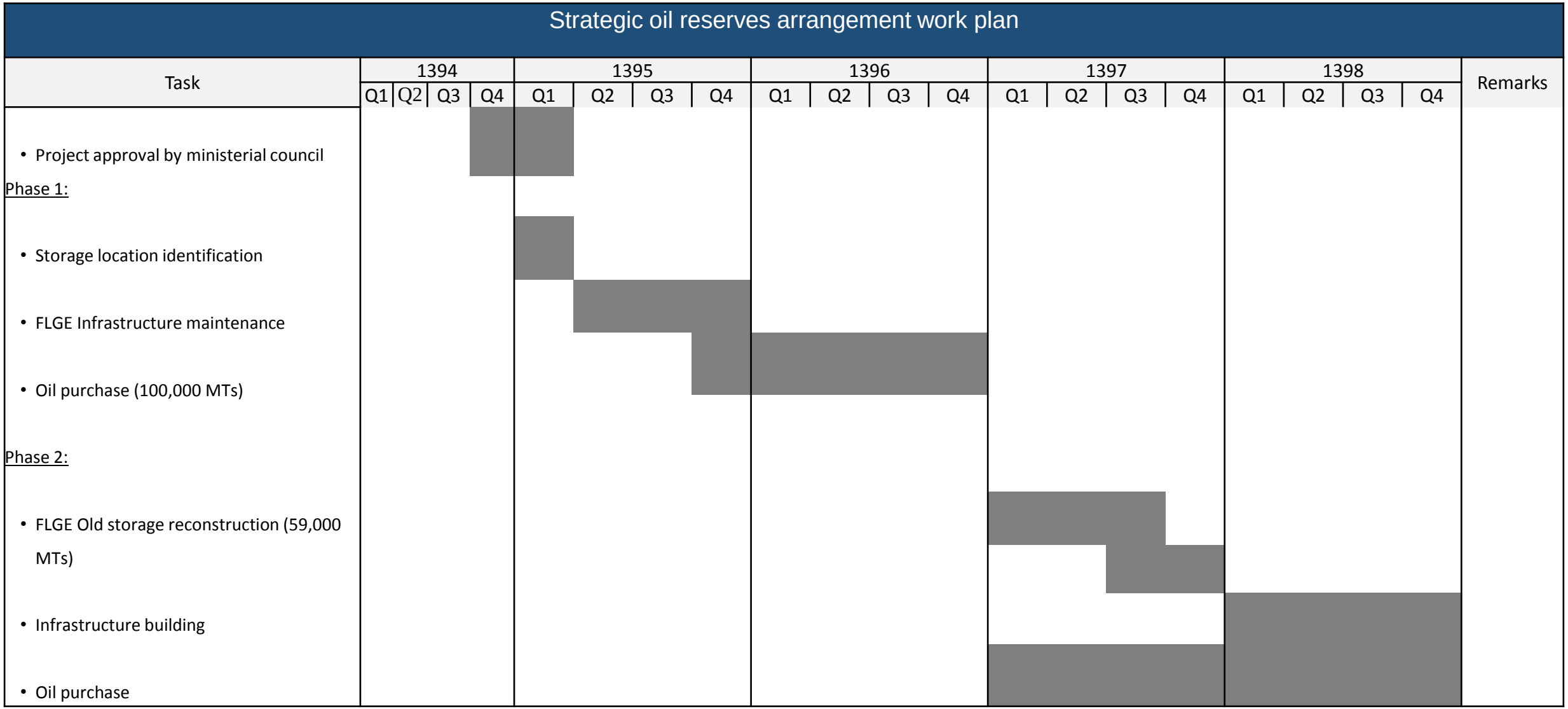
1394	1395 / 1396	1397 / 1398
1) Create Afghan Petroleum and Gas Authority (APPGA) and transfer all regulatory responsibilities to this entity 2) Create seven national oil and gas reserve areas (matching MoD and MoI corps boundaries) 3) Verify operating capacity and map exact location of all private FLGE, MoD, and MoI locations (estimated to be ~400,000 MTs) 4) Transfer FLGE under ICA 5) Reorganize FLGE under a new tashkeel (see previous section) 6) FLGE to send fuel storage rehabilitation project proposal to ministerial council for approval 7) Procure goods through National Procurement Authority (NPA)	1) Review APPGA after first year of operations. Ensure strategic plan is being implemented 2) Measure progress of FLGE's fuel storage rehabilitation plan 3) Begin FLGE quarterly financial audits 4) Replace FLGE management team 5) Grant APPGA the authority to check MoD and MoI fuel reserves 6) Incentivize private oil firms to hold a larger stock of reserves through provision of tax breaks for amounts held greater than 25,000 MTs 7) Sign MoU with Turkmenistan to purchase fuel from these countries at reduced prices 8) Begin oil purchase program ($25 million per year)	1) Ensure that the FLGE fuel rehabilitation is complete 2) Continue FLGE quarterly audits 3) Ensure that APPGA releases quarterly review of oil sector 4) Incentivize oil firms to hold a larger stock of reserves 5) Continue oil purchase program ($25 million per year)

Contents

Below is the five year implementation schedule to reform FLGE and regulate the oil and gas sector



Below is the five year implementation plan to develop a strategic petroleum reserve (SPR) in Afghanistan



Contents

Badam Bagh oil storage facilities have the capacity of 41,615 tons of oil

These are 8 oil facilities, each has the capacity of 5 million

45 tankers for lubricant oil with the capacity of 30,000 litters

The facilities have auto control station

Auto water pump station which pump water to the facility

Benezaar oil storage facilities have the capacity of 6,000 tons

there are 50 storages with capacity of 75,000 Littre

6 storages for reserving petrol

there are 4 storages for lubricant

Storage facilities were surrounded by residential houses

In Benazaar parking lot 94 trucks are parked

Each tanker has the capacity of 10 to 14 MTs

the trucks are ready for transportation

there is one non-operational pump station in the parking lot

useful life of the trucks very short

FLGE built a new gas storage facility in Kabul during 1393. This new facility has a capacity of 2,000 tons and is currently filled to capacity. They are bullet-proofed, well built, and are equipped with modern technology and security

Kabul reservoir is filled with 2,000 tons of gas

The reservoir maintains two fire fighting trucks

The reservoirs have a centralized controlling system

Reservoirs have 20 gas distributing stations

FLGE built a new gas storage facility in Pul Matak (Parwan) during 1393. This new facility has a capacity of 7,000 MTs, they are bullet-proofed. 4 non-operational oil tankers (400 MTs capacity) are also located in the area

2,000 MTs of the storage is operational

The facility has manual control system

5,000 MTs is under construction

400 MTs of non-operational oil storage tankers

**Note: $232 million spent to build the gas reservoirs which are bullet proofed. FLGE currently store 8,000 tons of gas*