DEVELOPMENT PLAN FOR PAKISTAN

OIL AND GAS INDUSTRY

2020

MINISTRY OF ENERGY (PETROLEUM DIVISION)

Petroleum & Natural Resources Division was created in April 1977. Prior to that Petroleum and Natural Resources was part of the Ministry of Fuel, Power and Natural Resources.

To perform its functions, the Petroleum & Natural Resources Division has been organized into four wings i.e. Administration, Development, Mineral and Policy. The Ministry has one Attached Department, one Autonomous Body and 11 companies. The Secretary is assisted by two Additional Secretaries, two Joint Secretaries, and five Directors General.

MISSION STATEMENT

To ensure availability and security of sustainable supply of oil and gas for economic development and strategic requirements of Pakistan and to coordinate development of natural resources of energy and minerals.

MR. OMAR AYUB KHAN

Minister Petroleum Division

MR. NADEEM BABAR

Special Assistant to Prime Minister on Petroleum

MIAN ASAD HAYAUD DIN

Secretary Petroleum Division

ABBREVIATIONS

$/BBL	US Dollar per Barrel
$/MMBtu	US Dollar per Million British thermal unit
APL	Asia Petroleum Limited
ARL	Attock Refinery Limited
BCF	Billion Cubic Feet
BCFD	Billion Cubic Feet per Day
BYCO	Byco Oil Pakistan Limited
FOTCO	Fauji Oil Terminal & Distribution Company Limited
GOP	Government of Pakistan
HSD	High Speed Diesel
HSFO	High Sulphur Furnace Oil
HOBC	High Octane Blending Component
ISGS	Interstate Gas Systems
KPT	Karachi Port Trust
Km	Kilometer
KMK	Karachi Mahmoodkot
LSFO	Low Sulphur Furnace Oil
MBPD	Thousand Barrel per Day
MMBBL	Million Barrels
MMBOE	Million Barrels of Oil Equivalent
MMCFD	Million Standard Cubic Feet per Day
MMT	Million Tonnes
MMTOE	Million Tonnes of Oil Equivalent
MTPA	Million Tonnes per Annum
MUS$	Million US Dollar
NEPRA	National Electric Power Regulatory Authority
NRL	National Refinery Limited
OCAC	Oil Companies Advisory Council
OGRA	Oil & Gas Regulatory Authority
PAPCO	Pak Arab Pipeline Company
PARCO	Pak Arab Refinery Limited
PEY	Pakistan Energy Yearbook
PPIS	Pakistan Petroleum Information Service
PEY	Pakistan Energy Yearbook
PQA	Port Qasim Authority
PRL	Pakistan Refinery Limited
TAPI	TAPI Pipeline Company Limited
TCF	Trillion Cubic Feet
YoY	Year on Year

CONTENTS

INTRODUCTION

INTRODUCTION

OBJECTIVE OF THE PLAN

Under the leadership of the Oil and Gas Working Group of the Energy Working Group of the China-Pakistan Economic Corridor, with the aim of promoting the healthy development of the oil and gas industry in Pakistan, the data-based development plan is therefore formulated for the oil and gas industry in Pakistan, providing advice, guidance and technical support for the participation of all parties in the cooperation of the oil and gas projects in Pakistan.

PROJECT SCOPE

1. Planning area: all over Pakistan, focusing on the developed areas of Pakistan's economy and radiating the surrounding areas.
2. Scope of planning in oil and gas industries: exploration, development and production in oil and gas industry, import, storage and transportation facilities, refining facilities and key construction projects.

PRINCIPLES AND BASIS OF PLANNING

Planning Principle

1. Connecting with relevant planning of Pakistan: The oil and gas planning is carried out by analyzing and forecasting the supply and demand of the oil and gas for Pakistan and combining relevant oil and gas projects for the country.
2. Scientific planning, rational distribution and combination of near and long-term goals: On the basis of combing the factors of Pakistan's oil and gas demand, social and economic development needs, resource endowments and construction conditions, make overall plans and consider the needs and possibilities, and reasonably determine the planning layout.

Basis of Planning

1. Data and information collected from Government directorates, departments, enterprises, regulatory bodies, and think tanks. Data used is for period ending June 2019 and in some instances 2018 data is used, which does not materially affect the plan quality. Plan outlook period is considered up to 2028-30, although demand-supply forecasts up to 2043 have been modelled by a think tank but a more conservative approach has been adopted in the Development Plan.
2. Relevant policies, current information, project profiles and other documents provided by Ministry of Energy (Petroleum Division), other institutions and companies.

Planning ideas

The development plan for Pakistan's oil and gas industry includes both technical and commercial aspects:

1. **Technical Aspect:**
    a. Data on domestic oil and gas production and reserves, historical trend and forecast.
    b. Data on imported oil and gas, facilities, historical trend and forecast.
    c. Data on oil and gas markets, consumption trend, market share etc.
    d. Pakistan Regulatory structure for oil and gas i.e. legal framework, policies, rules & regulations & regulatory bodies for the upstream, midstream and downstream sectors of oil and gas.

2. **Commercial Aspect:**

Taking into consideration Pakistan's economic base and corporate investment aspirations, drawing up priority implementation project conditions, identifying planning risks, and putting forward relevant policies of oil for gas projects. GDP growth for Pakistan under the current pandemic situation is forecasted by the World Bank to decline to 1.3 % in year 2020, 3% for year 2021 and 3.9% for 2020. Asian Development Bank[1] has forecasted GDP growth suppression to 2.6% in 2020 with recovery to 3.2% in 2021. SBP's projections for GDP growth is 3.0% for 2020[2]. The demand-supply outlook, currently based on GDP growth 5% would be adjusted in the post-pandemic recovery period.

[1] **Asian Development Outlook 2020**

[2] **State Bank of Pakistan - Second Quarterly Report 2019 - 20**

PAKISTAN ENERGY PROFILE

PAKISTAN ENERGY PROFILE

Pakistan is the sixth largest country in the world with a population of 217 million people in 2019, and covers an area of 881,913 square kilometers sharing its borders with India, Iran, Afghanistan & China. Pakistan has an emerging economy with a GDP of USD $283.3 billion in 2019. Pakistan GDP expanded 3.3 % YoY in Jun 2019, following a growth of 5.8 % in 2018. This coupled with the population growth rate of 2.4% has translated into an increase in energy demand at 108.5 MMTOE in 2018. In the lean period of five years from 2009 to 2013, growth in energy supply stagnated to a CAGR of 0.52%. Energy supply has since increased at a CAGR of 5.97% to reach 86.3 MMTOE in 2018. Indigenous production contributed 46.7 MMTOE whereas, imported energy contributed 41.5 MMTOE of the total energy available with 1.9 MMTOE of energy exports made in 2018.

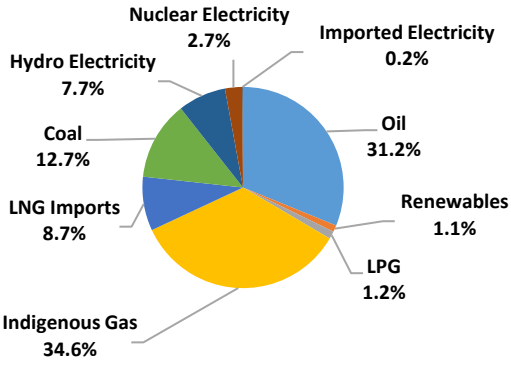
TOTAL ENERGY SUPPLIES

Primary Energy Supply

Total primary energy supply stands at 86.3 MMTOE in 2018, registering an impressive growth of 8.4% from 2017, due to the introduction of newer energy supplies i.e. LNG imports, renewable energy, coal and nuclear power projects. Indigenous natural gas is the biggest source of primary energy in the country with a share of 34.6% (29.8 MMTOE), LNG imports continue the increasing trend with an 8.7% share of the energy mix in 2019 up from 5.6% in the last year. Oil remained second with 31.2% (26.9 MMTOE energy supply) showing a decline of 1.68% from last year supply of 27.36 MMTOE.

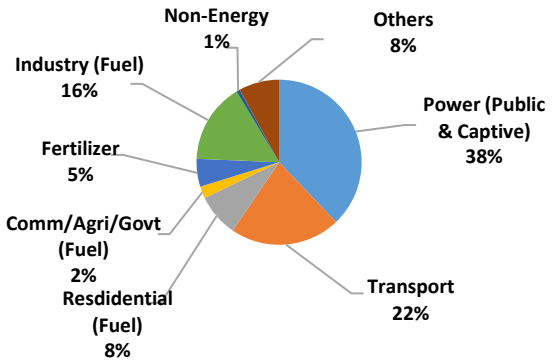
Other major sources are hydro and coal with 6.6% and 12.7% share of the energy mix. Coal supplies have increased to record high of 10.9 MMTOE, the increase is to meet coal demand of new coal power plants built as part of CPEC projects and the cement industry. Nuclear also increased its share in the energy mix to 2.7%, with an energy supply of 2.36 MMTOE. The share of hydro, nuclear and renewables are expected to continue based on Government's plans of establishing a rational energy mix of cheaper, cleaner and sustainable energy supplies.

Chart 2.1: Primary Energy Supply Mix (2018)



Source: PEY

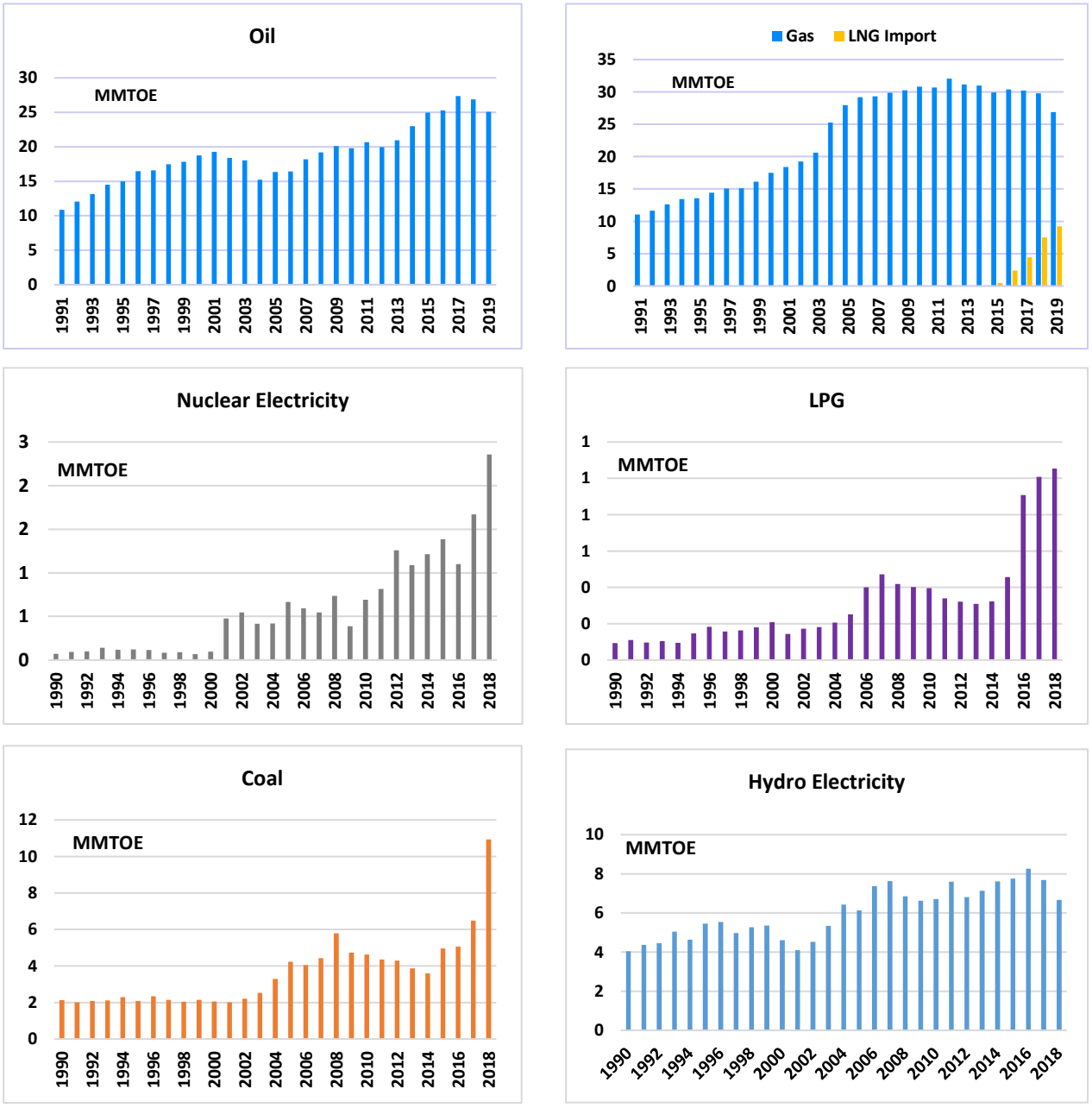
Chart 2.2: Primary Energy Consumption (2018)



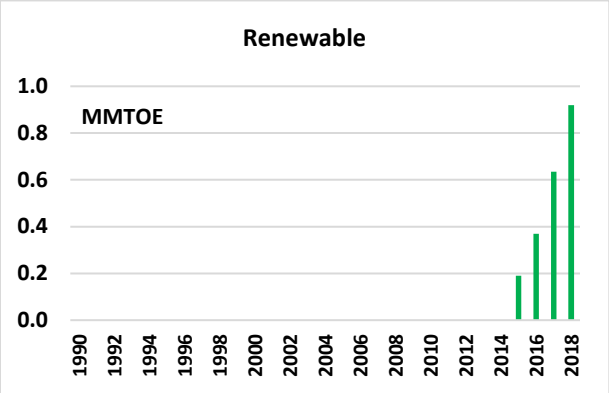
Source: PEY

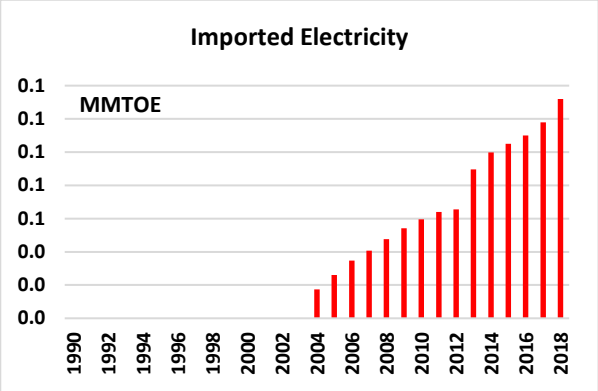
In terms of consumption, primary energy has mostly been consumed by the power sector (38%), followed by the transport sector (22%) and the industrial sector (16%). The residential sector accounted for (8%). The fertilizer sector consumed (5%) of the primary energy. Chart 2.3 depict the primary energy supply trends since 1990 for each of the primary energy fuel, with growth witness for each primary fuel after undergoing stagnation from 2008-2014.

Chart 2.3: Primary Energy Supply Trends



Source: PEY



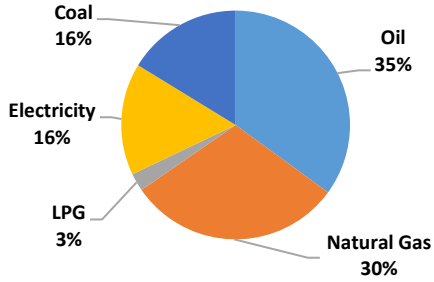


Source: PEY

Final Energy Consumption

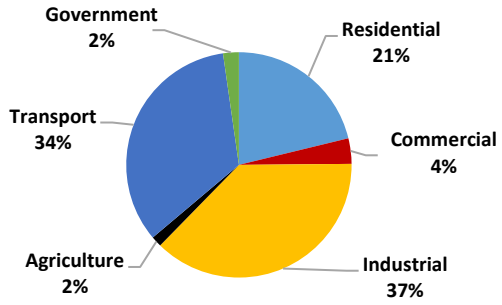
The total final energy consumption in 2018 stands at 55 MMTOE. Oil is the largest source of final energy with a 35% share (19.9 MMTOE), followed by natural gas with 30.4% share (16.69 MMTOE). Other final energy sources include coal at 16.3 %, electricity at 15.8% and LPG at 2.6% share of final energy mix.

Chart 2.4: Final Energy Consumption by source (2018)



Source: PEY

Chart 2.5: Final Energy Consumption per sector (2018)



Source: PEY

In terms of consumers, the industrial sector remains the biggest consumer of final energy, consuming 20.6 MMTOE of final energy (37% share), the second largest consumer of final energy was the transport sector with a share of 34% and consuming 18.6 MMTOE. Residential is the third largest consumer of energy with a share of 21% of all final energy consumed.

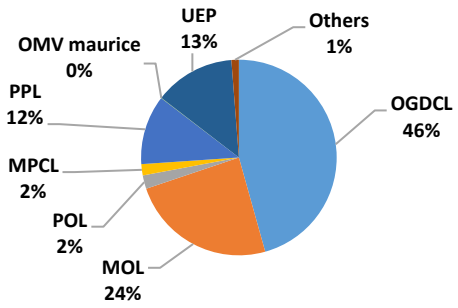
ENERGY INDUSTRY STRUCTURE

Pakistan's energy industry comprises of the upstream (E&P), oil downstream, gas downstream and power sectors. The oil downstream sector can be further segregated into oil refining & marketing.

Upstream (Exploration & Production) Sector

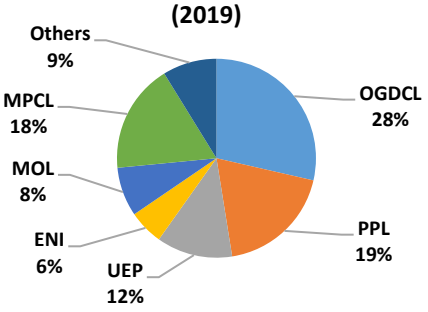
Pakistan's E&P sector has a mix of national and international companies (24 active companies as of June 2019) operating independently. Seismic activities have increased with approximately 2,064 LKM of 2-D seismic data and 1,596 square km of 3-D seismic data acquired in 2019. Similarly, 37 exploratory wells and 67 appraisal/development wells were spudded in 2019.

Chart 2.6: Local Oil Production Share (2019)



Source: PPIS

Chart 2.7: Local Gas Production Share (2019)



Source: PPIS

In terms of production, the average oil and gas production in 2019 stands at 89,030 BPD & 3,936 MMCFD, whereas, the remaining recoverable oil & gas reserves are 568 MMBBL and 21.45 TCF respectively.

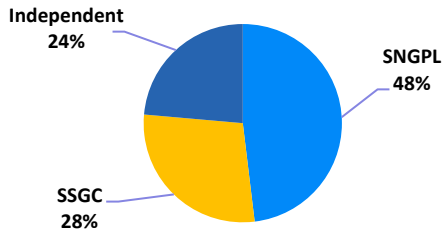
OGDCL remains the largest exploration and production company in the country, with a 45.3 % & 29.2% share of the total annual oil and gas production in the country. MOL is the largest private and second largest oil producing company in the country with a production share of 24%. PPL – a pioneer of exploration and production in Pakistan is the second highest gas producing company in the country with a 19.3% production share. Other major companies include Eni, MOL, MPCL, and UEP.

Downstream Sector

The oil downstream sector include six oil refining companies (PARCO, ARL, PRL, NRL, BYCO and Enar), 30 Oil Marketing Companies including private and public companies – PSO a public entity is the largest OMC in the country. Three oil pipeline companies exists in the country that are PAPCO, APL and ISGS. The storage of oil is undertaken by the OMCs whereas, two oil terminals exists in the country that are run by FOTCO and KPT and one SPM operated by Byco.

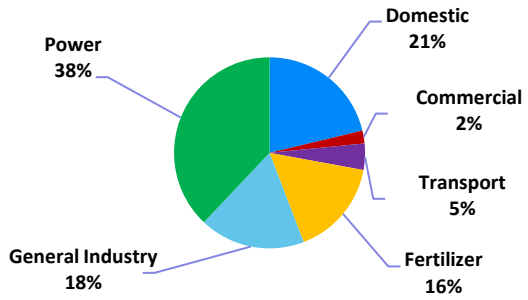
The gas downstream sector include two government owned utilities – SSGC and SNGPL that provide gas to the majority of the country, whereas, a small transmission network exists that is owned and operated by gas producers or bulk consumers for direct supplies.

Chart 2.8: Gas Market Share 2019



Source: DG Gas

Chart 2.9: Gas Consumption per Sector 2019



Source: DG Gas

REGULATORY STRUCTURE

Sector wise Regulatory Structure of Pakistan				
	Upstream (E&P)	**Oil Downstream**	**Gas Downstream**	**Power**
Governing Ministry/Authority	**The Ministry of Energy (MOE)/Oil & Gas Regulatory Authority (OGRA)/National Electric Power Regulatory Authority (NEPRA)**			
Legal Framework	- Mines Act 1923 - Regulation of Mines and Oilfields and Mineral Development (Government Control) Act 1948, including Amendment of 1976 - Territorial Waters and Maritime Zones Act 1976	- OGRA Ordinance 2002		- NEPRA Act no. XL of 1997
Regulatory body	- Directorate General Petroleum Concessions	- Oil & Gas Regulatory Authority (OGRA)	- Oil & Gas Regulatory Authority (OGRA)	- National Electric Power Regulatory Body (NEPRA)
Polices	- Petroleum Policies 1994 – 2012 - Low BTU Gas Pricing Policy 2011 - Tight Gas (E&P) Policy 2011	- Petroleum Policy 1997	- Natural Gas Allocation and Management Policy, 2005 - Tariff Regime for Natural Gas Sector, 2018 - LNG Policy 2011 - LPG (Production and Distribution) Policy 2016	- Power Policy 2015 - Transmission Line Policy 2015
Rules & Regulation	- Marginal/ Stranded gas fields: gas pricing & criteria & guidelines 2013 - Pakistan Offshore Petroleum (Exploration & Production) Rules 2003 - Third Party Access Rules 2011 - Pakistan Onshore Petroleum (Exploration & Production) Rules 2013	- Pakistan Oil (Refining, Blending, Transportation, Storage and Marketing) Rules 2016 - Complaint Resolution Procedure Regulations, 2003	- OGRA gas (third party access) Rules 2018 - CNG Rules 1992 - LPG (Production & Distribution) Rules 2001 - LNG Rules 2007 - Natural gas wellhead regulation 2009	- NEPRA Tariff Standards and Procedure Rules, 1998 - NEPRA Licensing Rules - (Distribution 1999), (Generation 2000) - NEPRA Performance Standards Rules - Distribution 2005) (Transmission 2005), (Generation 2009)

Source: MOE, OGRA NEPRA

LEGAL FRAMEWORK FOR UPSTREAM SECTOR

Laws

- Mines Act 1923
- Regulation of Mines and Oilfields and Mineral Development (Government Control) Act 1948, including Amendment of 1976
- Territorial Waters and Maritime Zones Act 1976
- Pakistan Environmental Protection Ordinance 1997
- Income Tax Ordinance 2001 (Fifth Schedule)

Rules & Regulations

- Pakistan Petroleum (Production) Rules 1949
- Oil and Gas (Safety in Drilling & Development) Regulations 1974
- Pakistan Petroleum (Exploration & Production) Rules 1986
- Pakistan Petroleum (Exploration & Production) Rules 2001
- Pakistan Offshore Petroleum (Exploration & Production) Rules 2003
- Pakistan Onshore Petroleum (Exploration & Production) Rules 2009
- Third Party Access Rules 2011
- Pakistan Onshore Petroleum (Exploration & Production) Rules 2013

Policies and Guideline

- Petroleum (Exploration & Production) Policies 1994 to 2012
- Low BTU Gas Pricing Policy 2012
- Tight Gas (Exploration & Production) Policy 2011
- Marginal/ Stranded Gas Fields: Gas Pricing & Criteria and Guidelines 2013

Source: MOE

SALIENT FEATURES OF PETROLEUM POLICY 2012

In order to encourage and attract foreign investment in the Petroleum Sector, the Petroleum Division has formulated the Petroleum Exploration & Production Policy, 2012. The new policy contains various incentives to attract Foreign Direct Investment/potential investors.

Salient features of petroleum (exploration and production) policy 2012 are as under:

- In order to accelerate exploration, the period of exploration license has been reduced from 9 years to 7 years i.e., 5 years initial term (Phase-I of 3 years + Phase-II of 2 years) + two renewals of one year each. Similarly appraisal renewal period has been reduced from two years to one year

- Better gas price has been given to E & P companies in order to attract more investment;

    - Windfall Levy reduced from 50% to 40%
    - Base price for crude oil and condensate increased from US $30 /barrel to US $40/barrel
    - Base price will escalate each calendar year by US $0.5/barrel
    - Ceiling of US $100/barrel replaced with US $110/barrel

- Provincial Government Holding company shall also have the first right to makeup required minimum Pakistani working interest without reimbursement or payment of any past cost. 5% carried interest (Government Holding 2 1/2 % and Provincial Government's Holding Company 2 1/2 %)

- Renewal of lease after expiry of lease term for another five years subject to payment an amount equivalent to 15% of the will head value. Sale of 90% share of pipeline specification gas to Government of Pakistan and 10% by E & P companies to any buyer with prior consent of Government

- A bonanza of US $1/MMBTU for first three discoveries in offshore area. Policy 2012, gas price will also be extended to leases for additional 10% production over and above the commitment of Development Plan approved by the Government.

A new zone (Zone-1(F)) has been created, covering the frontier areas of Balochistan and Khyber Pakhtunkhwa, including unexplored areas of Kharan and Pishin. These areas may have gas reserves potential of over 21 TCF. The gas price for Zone-1 (F) has been increased and set equal to the price for the Zone-0 shallow waters.

KEY ENERGY STATISTICS 2019

Overview		
Population	MN	217
Households	MN	33.85
Real GDP	USD BN	283.3
GDP Growth	Percentage	3.3
GDP/Capita	USD	1,357
GDP/Capita (PPP)	USD	5,839

Upstream Oil & Gas		
Oil Production	BPD	89,030
Gas Production	MMCFD	3,936
Total LPG Production	MTons/day	2,217
Oil Reserves	MMBBL	568
Gas Reserves	TCF	21.45

Gas Transmission & Distribution		
Gas Production	BCF	1,424
LNG Imports	MMTOE	9.4
Total Customers	MN	9.7
Access to Natural Gas	%POP	28
T&D Network	'000 KM	193

Refining & Marketing		
Refining Capacity	MMTPA	19.37
Oil Storage	MMT	3.5
Oil Pipeline Network	KM	3,470
Retail Outlets	NOS	8,246

Coal		
Coal Production	MMT	5.5
Coal Resources	MMT	186,000
Coal Imports	MMT	15.5

Power Generation		
Gross Electricity Generation	GWH	122,708
Total Power Consumption	GWH	87,505

PAKISTAN OIL & GAS RESOURCES

PAKISTAN OIL & GAS RESOURCES

DOMESTIC RESOURCES

> ***'Foreign investment is fully protected under foreign investment protection law of 1976 passed by the Parliament, under which the Government guarantees full safeguard to foreign investments in Pakistan.'***

As on 30th June 2019, the country's oil 2P reserves (balance recoverable) stand at 568 million US barrels an increase of approximately 64% from 347 million US barrels in 2018. Gas 2P reserves (balance recoverable) stand at 21.45 TCF up from 19.54 TCF in 2018, an increase of approximately 10%. The increase in the country's oil & gas reserves is a result of the GOP's policy of aggressive exploration & production in the country, the advent of 3D seismic surveying and advanced exploration techniques & tools. The average success rate has increased gradually from 16% to 33% in 66 years of petroleum exploration history of the country, this has been greatly supported by 3D seismic data in lower Indus basin post 2005.

Pakistan offers huge potential for the exploration & production of oil and gas as evident in figure 3.1 (refer on next page). Around 96% of the country's exploration wells have been drilled in two basins that are the "Kohat & Potwar Basin" and the "Lower & Middle Indus Basin-(~73% in Foreland and ~7% in the Foldbelt)". Only 4% of the remaining exploration well been drilled in other basins. Vast areas in the province of Balouchistan, Punjab and Khyber Pakhtunkhwa remain unexplored.

The areas that are unexplored include the "Suleiman and Kirthar Foldbelts" that are laced with technical (mountainous terrain) and non-technical (access issues). However, recent years have seen a marked improvement in security access of these areas and companies with advanced exploration skills and technologies can exploit the huge oil and gas potential.

Similarly, the Punjab Platform area in the "Middle Indus Basin" is another area where exploration activities have been very limited in the past mainly due to absence of the structure plays on vintage seismic data, and less effort has been made to explore the stratigraphic plays in the monoclinal rise of the strata toward east and south east at Punjab Platform. Some efforts have been made to explore the deeper Salt Range/Infra-Cambrian section that hitherto remained unsuccessful even though there are reported heavy oil discoveries on the Indian side of Punjab Platform.

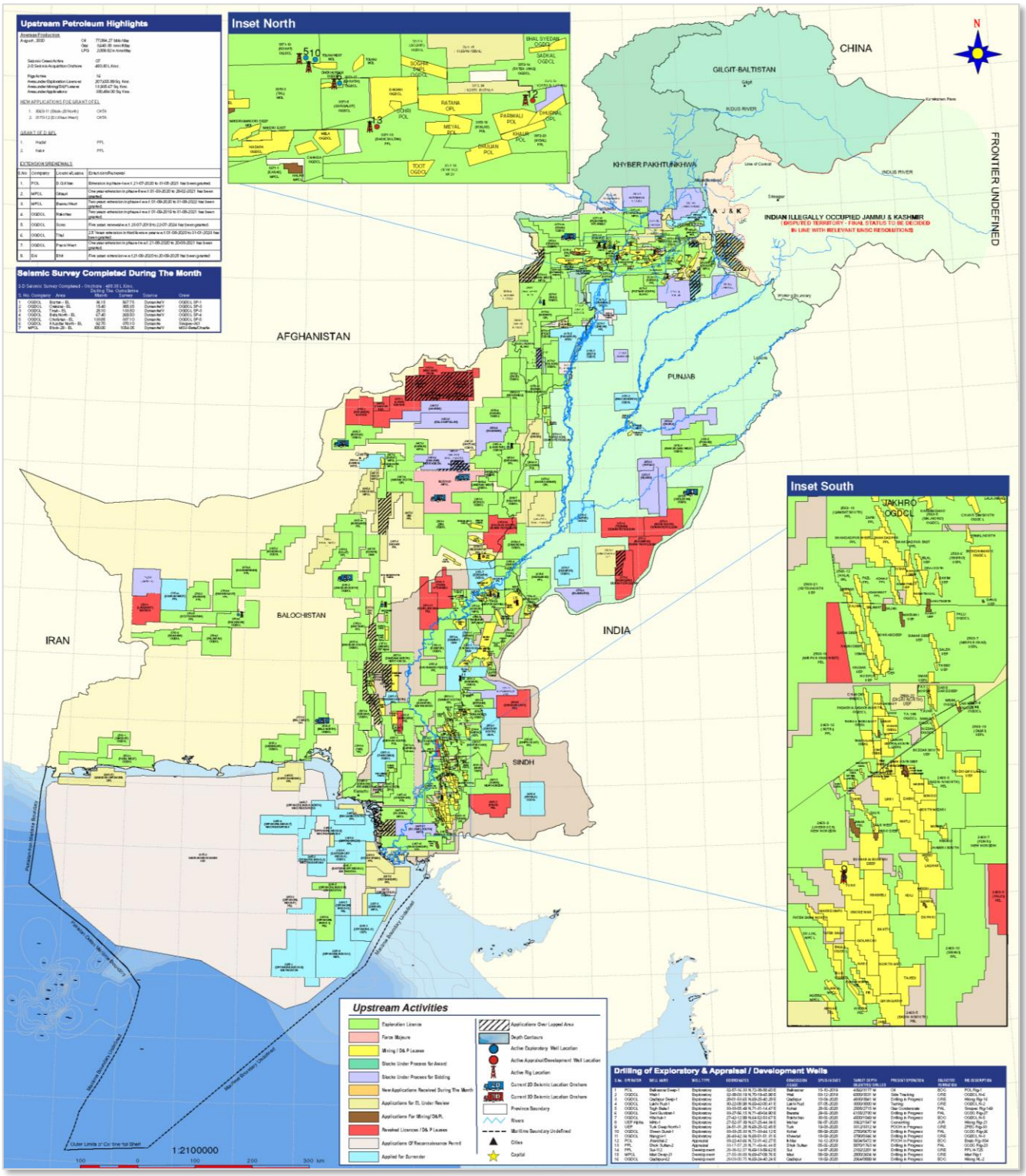


Figure 3.1: Pakistan Exploration Map
Source: PPIS

Oil & Gas 2P Reserves

Table 3.1: Oil & Gas 2P Reserves			
	Original Recoverable	**Cumulative Production**	**Balance Recoverable**
Oil – Million US Barrels	1498.7	930.3	568.45
Gas – Trillion Cubic feet	61.2	39.7	21.45

Source: PPIS

Reserve to Production Ratio

As of 30th June 2019, the country's total remaining recoverable oil and gas reserves based on 2P classification stood at around 568 MMBBL for crude oil/condensate and 21.45 TCF for natural gas. Based on 2019 production levels, the reserve to production ratio works out to about just 17.5 years for crude oil/condensate and 14.9 years for natural gas.

Table 3.2: Reserve to Production Ratio		
	Crude Oil/Condensate	**Natural Gas**
Reserves (2019)	568.45 MMBBL	21.45 TCF
Production (2019)	89,030 BPD	3,936 MMCFD
Reserve Life	17.5 years	14.92 years

Source: PPIS

Reserve Replacement Ratio

Total country proved reserves aggregated 291 MBOE, including 252 MMBOE of natural gas and 33 MMOE of liquid hydrocarbons. Total proved reserves (oil and gas) increased substantially compared to 2018, representing a reserve replacement ratio of 291% for the year 2019.

Table 3.3: Reserve Replacement Ratio		
	2018	**2019**
Production	291 MMBOE	288 MMBOE
Reserves added	91 MMBOE	836 MMBOE
Reserve Replacement Ratio	31%	291%

Source: PPIS

PAKISTAN OFFSHORE

The Pakistan Offshore comprises of the Indus and Makran basins. The Indus basin encompasses an area of greater than 250,000 sq. km and bears analogy to some of the most prolific offshore deltas in the world such as Niger (45 BBOE), Mahakam (11 BBOE), and Nile (5 BBOE). Till date only 18 exploratory wells have been drilled. The lack of activity has been attributed to;

a. Availability of limited geological information due to low exploration activity amid complex geological nature of Pakistan offshore.
b. Requirement of large amount of risked capital.

UEP a private E&P company carried out extensive 3D seismic data interpretation and other detailed studies on offshore potential of Pakistan in collaboration with China Petroleum National Corporation and China National Offshore Oil Company which have supported the possibility of existence of hydrocarbon system. Presence of numerous gas seepages along the coastal area of Makran basin supports the argument.

UNCONVENTIONAL RESOURCES

Unconventional resources include tight gas/oil, shale gas/oil. Tight and Shale resources are regulated by the office of Directorate General Petroleum Concessions, while CBM is a provincial subject.

Tight and shale formations are almost invariably encountered in drilling of conventional formations therefore core data on these two formations is mostly available with the E&P companies although detailed core analyses and studies may not have been performed in most cases to keep the exploration and development costs low for conventional resources.

Tight Resources

Tight resources exploration and exploitation precedes that of shale for ease of exploration, development and economic reasons, therefore, tight resources are found and commercially developed before commercial exploitation of shale resources.The country's major E&P companies have presented their work at various fora estimating tight gas resources as 35-40 TCF in the Middle – Lower Indus Basin alone, based on geological prognosis. Tight gas programme could be materialized in the near-term to add considerable resources to the country's declining production. It is a faster approach to improve the country's energy security by reliance on indigenous resources in the backdrop of depleting conventional hydrocarbon resources.

Shale Resources

Pakistan is considered to have vast untapped shale gas potential. Lower Indus basin has, to date, sourced significant volumes of conventional oil and gas and is now believed to be home to enormous shale resources as well. According to US Energy Information Administration (US EIA) estimates, Pakistan has technically recoverable shale gas reserves of 105 TCF. In addition southern Pakistan is estimated to hold shale oil reserves of over 9 billion barrels. At the end of 2015, Pakistan's Ministry of Energy (Petroleum Division) completed a study on evaluation of shale oil and gas resources in the Lower Indus Basin and the Middle Indus Basin with the help of USAID. The results turned out that Pakistan's shale gas geological resources amounted to 95 TCF risked recoverable reserves and 14 billion barrels risked technical recoverable oil reserves.

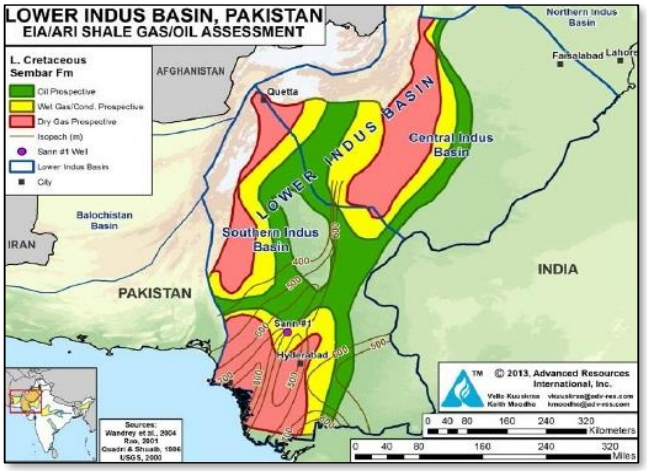


Figure 3.2 Shale Potential in Sembar Formation

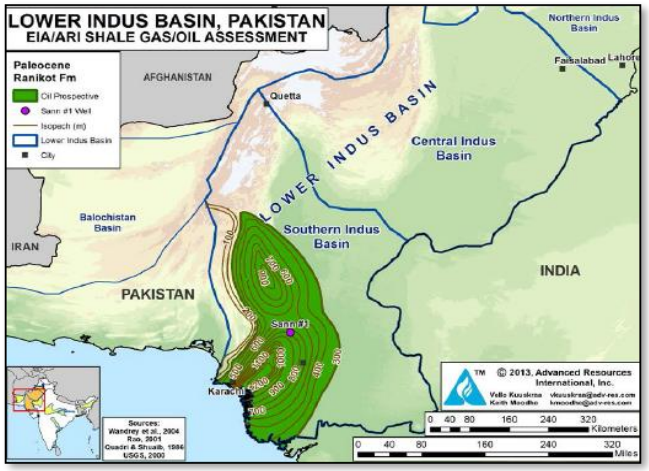


Figure 3.3: Shale Potential in Ranikot Formation

PAKISTAN OIL & GAS IMPORTS

PAKISTAN OIL & GAS IMPORTS

OIL IMPORTS

Pakistan imports most of its oil, as local oil accounts of only 16% of its total oil consumption. Further, the oil refinery sector only caters to approximately 50% of the local petroleum products demand, whilst, the rest was imported costing the country's exchequer billions of dollars.

The total import volume of Pakistan oil reached 17.97 MMT in 2019, including 9.2 MMT of imported crude oil and 8.76 MMT of imported refined oil, as shown in Table 4.1

Table 4.1 Pakistan Oil Imports by Type

Year	Imported crude oil (MMT)	Imported refined oil (MMT)	Total (MMT)
2015	8.32	12.64	**20.96**
2016	8.74	13.65	**22.39**
2017	8.41	15.49	**23.92**
2018	10.39	14.32	**24.72**
2019	9.21	8.76	**17.97**

Source: OCAC

Import costs

Pakistan spends huge amounts of foreign exchange each year importing crude oil and refined oil. As shown in Table 4.2, international oil prices rebounded since 2016, and the cost of importing oil into Pakistan has increased. However, in the recent months starting 2020 the prices have declined drastically and its impact on Pakistan's energy scene would be assessed soon. Compared with 2017, the import cost of crude oil had increased significantly in 2019, reaching US $ 4952 million, up more than 45%, mainly due to the increase in crude oil import by 18%. The import cost of POL products in 2019 was recorded at US $ 6,283 million, decreasing from US $ 7,497 million in 2018.

Table 4.2: Import Cost of Oil

FY	Crude Oil		POL products		Total expense (Million US $)
	Volume (MMT)	Value (Million US $)	Volume (MMT)	Value (Million US $)	
2015	8.3	4,559	12.64	7,271	**11831**
2016	8.74	2,758	13.65	4,776	**7,535**
2017	8.41	3,077	15.5	6184	**9083**
2018	10.39	4,914	14.3	7,497	**12411**
2019	9.21	4,952	8.76	6,283	**11235**

Source: OCAC, MOE, PBS

As shown in Table 4.3, the import of Pakistan refined oil mainly consists of automobile gasoline, high-speed diesel and high-sulfur fuel oil. With the development of economy and the attention to environmental protection, the import of high-octane gasoline and low-sulfur fuel oil has been increasing in recent years. In 2018, the largest imports were vehicle gasoline, high-speed diesel, high-sulfur fuel oil, low-sulfur fuel oil and aviation gasoline. Imports of gasoline and high-speed diesel were up about $15/ BBL in 2017, while imports of fuel oil were up about $10/ BBL.

Table 4.3 Import Costs of Petroleum Products

Products	Import	2014	2015	2016	2017	2018
100/LL	Quantity/t	130,000	47,000	110,271	119,278	236,538
	Value/MM$	131	044	053	058	147
	Price $/b	135.25	125.19	64.05	65.05	83.65
HOBC	Quantity/t				135,794	86,441
	Value/MM$				0.78	0.60
	Price $/b				76.87	92.94
HSD	Quantity/t	2,568,000	3,277,000	3,064,764	3,796,040	3,845,272
	Value/MM$	2343	2107	1128	1749	2127
	Price $/b	122.40	86.26	49.39	61.82	74.24
HSFO	Quantity/t	6,529,000	6,701,000	5,219,995	5,869,157	3,791,786
	Value/MM$	4135	3060	1145	1731	1401
	Price $/b	84.96	61.26	29.43	39.56	49.61
LSFO	Quantity/t			903,147	663,889	455,588
	Value/MM$			235	29	183
	Price $/b			34.84	46.32	53.93
Motor Spirit	Quantity/t	2,296,000	3,322,000	4,251,563	4,561,112	4,928,112
	Value/MM$	2292	2202	2098	2339	366
	Price $/b	133.92	88.93	66.20	68.80	83.52
Total	Quantity/t	**11,523,000**	**13,347,000**	**13,549,740**	**15,145,270**	**13,343,737**
	Value/MM$	**8901**	**7413**	**4659**	**6184**	**6985**
	Price $/b	**103.63**	**74.51**	**46.13**	**54.78**	**70.26**

Source: PEY

GAS IMPORTS

Pakistan started importing gas in the form of LNG to meet gas demands particularly in the Power Sector. At present four long-term LNG supply agreements exists for import of 6 MTPA LNG quantities. In addition, as and when required, LNG is also imported on spot basis. In addition to LNG imports, transnational pipeline projects are also in different stages of development. As shown in Table 4.4, Pakistan's LNG imports have grown rapidly since the first FSRU-based LNG Terminal was built in 2015.

Table 4.4 Pakistan LNG Import Costs

Year	2015	2016	2017	2018	2019
MMBTU	19,795,505	100,720,923	186,672,977	313,902,345	376,592,363
MTPA	0.42	2.14	3.97	6.67	7.24
BCF	20	103	190	320	353.88
Total Cost (MMUS$)	**151**	**642**	**1,278**	**2,452**	**3415.5**

Source: DG LG

Pakistan has signed a total of four long-term LNG supply contracts with Qatar, ENI, and two with Gunvor, with total import quantities of 6.0 MTPA with Qatar as major supplier followed by Gunvor and Eni.

PAKISTAN OIL & GAS MARKET

OIL MARKET

Oil Refineries

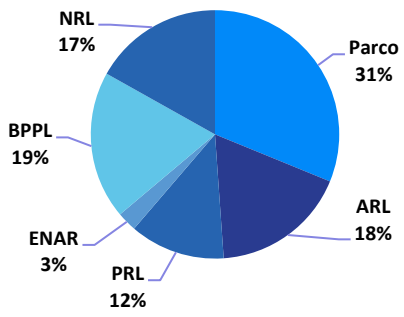
Pakistan consists of 6 refining companies. These refineries are Parco, PRL, NRL, ARL, Byco Petroleum & ENAR petrotech (table below for capacities). The Total Annual Refining capacity in 2019 stands at 19.36 MMT. Byco Oil Pakistan merged with Byco Petroleum Pakistan Limited with a total refining capacity of 7.17 MMT.

Table 5.1: Pakistan Refinery Capacity & Production – MMT		
Company	**Capacity**	**Crude Oil Processed**
Pak Arab Refinery	4.50	3.95
National Refinery Ltd	2.83	2.22
Pakistan Refinery Ltd	2.10	1.56
Attock Refinery Ltd	2.44	2.25
Byco Petroleum	7.17	2.41
Enar-Petrotech	0.32	0.31

Source: OCAC

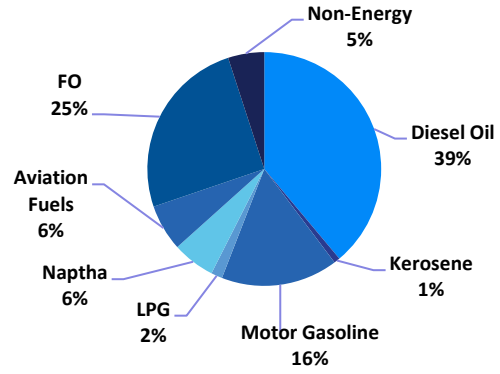
Parco dominates the refinery share with 31%, followed by Byco Petroleum Pakistan accounting for 19%, ARL contributed 18%, PRL and NRL contributed 12 and 17%. HSD is the largest produced petroleum product with 4.7 MMT, followed by furnace oil with 2.8 MMT and motor gasoline with 2.3 MMT.

Chart 5.1: Refining Production Share (2019)



Source: OCAC

Chart 5.2: Refineries Production Mix (2019)



Source: OCAC

These refineries have low refining technology levels, diesel products can meet Euro II standards, and gasoline product label is based on 87 RON and the highest is 92 RON.

On April 27, 2018, the Pakistan Government approved a package of incentives for all domestic new (non-second-hand/non-relocated) deeply converted oil refining projects, also including an expansion project of existing refineries whose minimum size is up to 100,000 barrels per day.

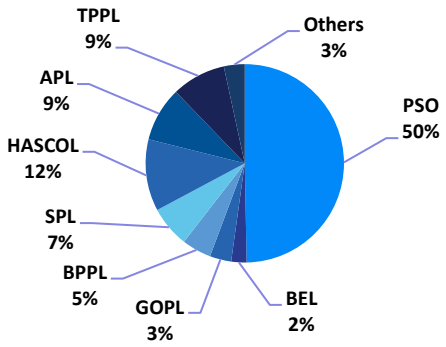
The main clauses cover exemption from income tax for 20 years, exemption from customs duties, taxes, surcharges and other taxes on refinery-related equipment, construction materials, construction machinery and personnel services required for imports, exemption from sales and consumption taxes on equipment, materials and services produced domestically, and preferential measures for projects such as employment, supporting imported facilities and pipelines.

Oil Marketing

The Pakistan oil marketing sector currently comprises of 30 OMCs. These OMCs include public & private bodies, all operating independently. PSO, a state-owned company dominates the petroleum market with a 50% share. Other notable Hascol Pakistan Ltd remains the largest private oil marketing company with a 12% share.

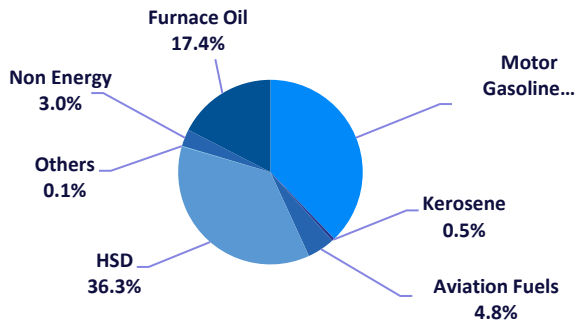
The total POL consumption in 2019 stands at 19.68 MMT. Motor gasoline and HSD are the major petroleum products with over 37% (7.67 MMT) and 36% (7.3 MMT) share of the total POL consumption. The share of furnace oil stands at 17% (3.5 MMT) down from 30% (7.17 MMT) last year.

Chart 5.3: OMCs Market Share (2019)



Source: OCAC

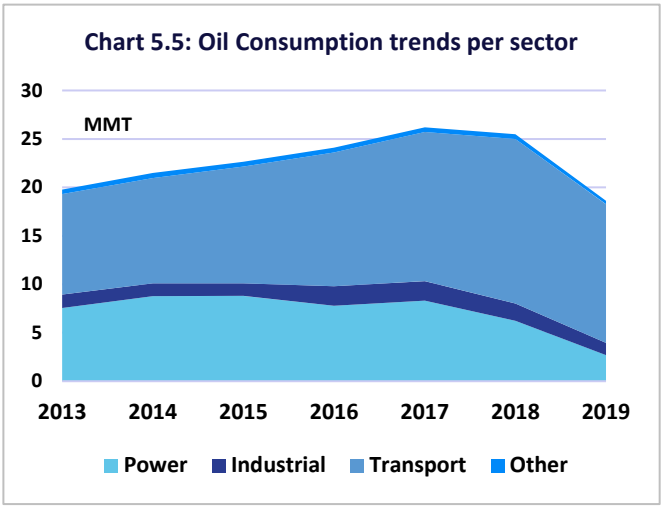
Chart 5.4: Petroleum Products Mix (2019)



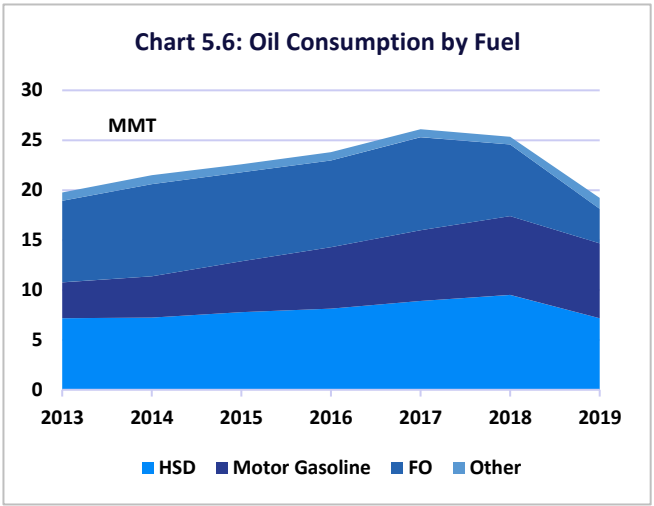
Source: OCAC

Chart 5.5 showcases the oil consumption trends per sector over the last six years with total consumption increasing from 9.8 MMT in 2013 to 25 MMT in 2018, however, consumption decreased to 19.7 MMT in 2019. Oil consumption in power sector has witnessed the largest reduction from approx. 7MMT in 2018 to 3.5 MMT in 2019, this is due to GoP policy of substituting oil based power generation with gas based generation.

Chart 5.6 shows the consumption trend by fuels, high speed diesel and motor gasoline the major petroleum products in the country have continued their extraordinary growth rates whereas, furnace oil has seen a decline in its consumption.



Source: OCAC



Source: OCAC

Oil Pipelines

Pakistan has an extensive oil pipeline network of approximately three thousand kilometers starting from the port city of Karachi to upcountry stations such as Faisalabad and Machike in Punjab. The major pipelines in the country are;

1. Karachi-Mahmood Kot (KMK) pipeline - Crude transfer, 864 KM length & 4.5MMT capacity.
2. White oil pipeline (WOP) - Dual oil transfer, 786 KM length & 5MMT capacity.
3. Keamari Korangi link pipeline (KKLP) - Crude transfer, 18.6 KM length & 10MMT capacity.
4. Korangi Port Qasim link pipeline (KPLP) – HSD transfer, 22.2 KM length & 6MMT capacity.
5. Mahmood Kot-Faisalabad-Machike (MFM) pipeline – dual oil transfer, 284 KM length & 3MMT capacity.
6. HUBCO Furnace oil pipeline – FO transfer, 82 KM length & 3.6 MMT capacity.
7. Balkassar-Khaur-ARL – Crude transfer, 116.4 KM length.

Future plans include the dualization of the White Oil Pipeline (WOP) Pipeline has been undertaken by PAPCO, that will allow the transportation of 4MMT MS in addition to HSD.

Port Handling

Pakistan crude oil and refined oil are mainly imported by sea, crude oil and refined oil import terminals are mainly located near the coastal city of Karachi, including Karachi port, Qasim port, and Balochistan province BYCO refinery unloading Single Point Mooring terminal. The total import capacity reached 51 MTPA. The handling capacity of each port is shown in Table 5.3.

Table 5.2: Basic Conditions of Oil Ports

Port	Capacity (Thousand Tonnes/a)
A. Karachi (KPT)	
OP-I	8,000
OP-II	8,000
OP-III	8,000
B. Qasim Port	
FOTCO	9,000
MW1-LCT	4,000
C. Baluchistan	
BYCO SPM	14,000
Total	51,000

Source: OCAC

GAS MARKET

Pakistan has a well segmented gas market offering a vast consumer base of approximately 9.7 million consumers (2019) consisting of domestic, commercial and industrial sectors, that are further divided into power, cement, general industry fertilizer and transport sectors. The two utilities SSGC and SNGPL serve the majority of the end consumers with a 31% and 69% share of the gas market. However indigenous gas supplies through SNGP, SSGCL to various consumers and by E&P companies to dedicated power and fertilizer plants are 36.5%, 34% and 30.4% respectively.

Table 5.3: Number of Gas Consumers 2019

Type	Punjab	KPK	Sindh	Balochistan	Total
Domestic	5,759,596	862,955	2,715,169	275,142	9,612,862
Commercial	49,469	9,353	21,817	2,780	83,419
Industrial	5,125	862	4,215	59	10,261
Total	**5,814,190**	**873,170**	**2,741,201**	**277,981**	**9,706,542**

Source: DG Gas

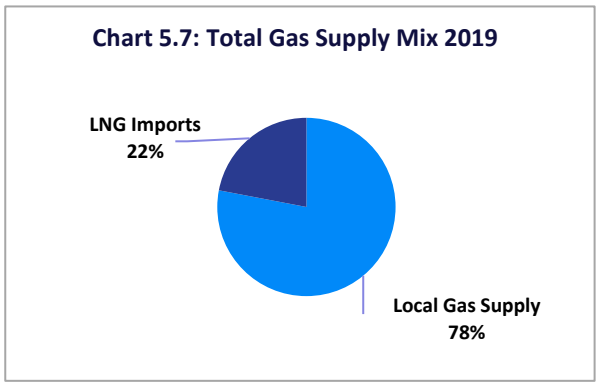
The total natural gas supply in 2019 stood at approximately 4,397 MMCFD with local production contributing 3,416 MMCFD natural gas and 981 MMCFD LNG imports.

Table 5.4: Province wise Indigenous Gas Supply and Consumption 2019

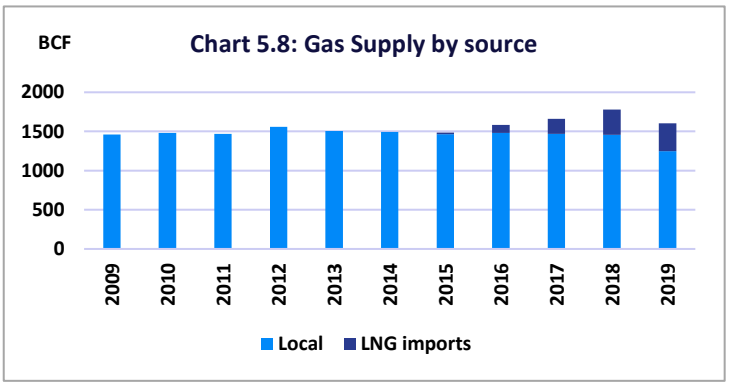
Type	Gas Supplies		Gas Consumption		Excess/shortfall	Provincial Consumption as %age of its supplies
	MMCFD	%age	MMCFD	%age	MMCFD	
Sindh	2251	65.9%	1738	50.9%	513	77%
Balochistan	656	19.2%	439	12.8%	217	67%
KP	398	11.6%	271	7.9%	127	68%
Punjab	111	3.3%	968	28.3%	(857)	
Total	**3416**	**100%**	**3416**	**100%**		

Source: DG Gas

As shown in chart 5.7 and 5.8, the share of LNG imports in the gas mix has increased in recent years from zero share in 2014 to approximately 22% share of the total gas supply mix in 2019. LNG imports are further expected to increase post rationalization of gas tariff slabs that will allow for the utilities to supply to more sectors and considering the demand/supply gap in future.

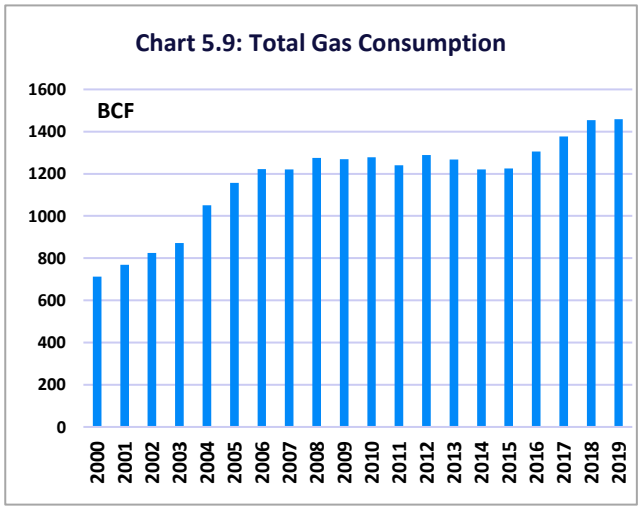


Source: PEY

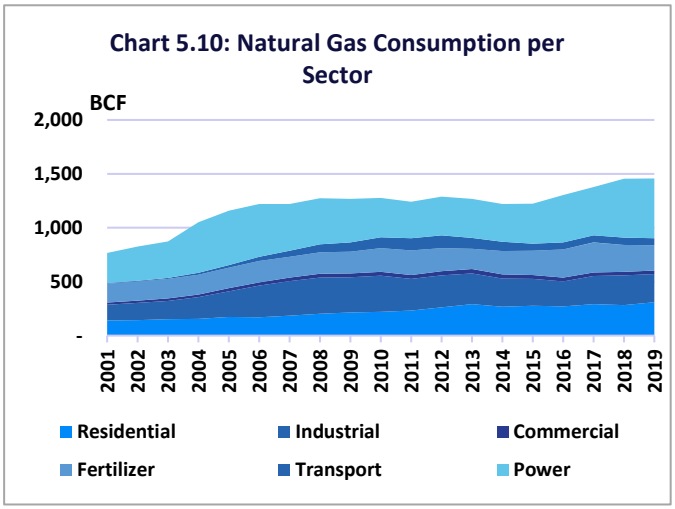


Source: PEY

Chart 5.9 shows a twenty years consumption trend of natural gas in the country. As evident, gas consumption saw extraordinary growth rate till 2006 on the back of economic growth and rapid induction of new consumers. Post 2006, gas consumption stayed stagnant due to constrained gas supplies owning to depleting gas fields in the country and the unavailability of gas import facilities. Recent years however, have seen consumption increase again to reach 1,458 BCF natural gas consumption in 2019, the highest consumption in the country's history.

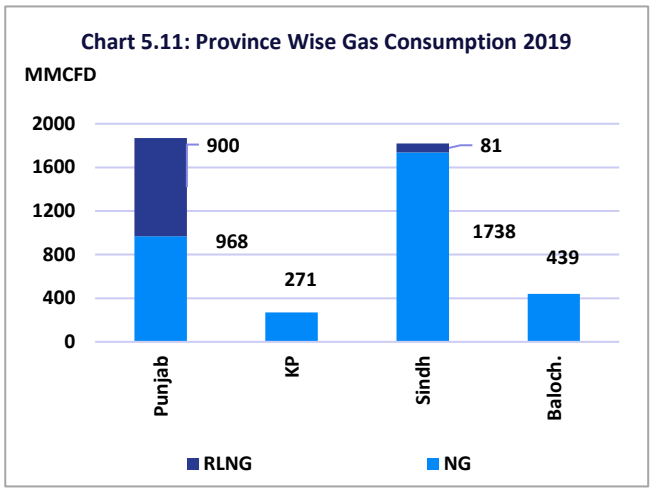


Source: PEY

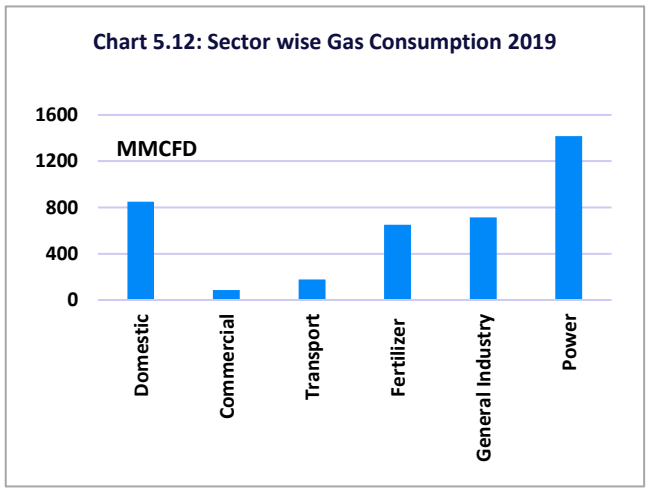


Source: PEY

Chart 5.10 shows the consumption trends of gas by sectors over the last twenty years. The power sector is the largest consumer of natural gas in the country consuming approximately 553 BCF gas in 2019. Gas consumption in residential sector has grown steadily over the years due to its priority in gas allocation and rapid expansion in the distribution pipeline network that grew at a CAGR of over 10% from 2007 to 2012 and 5% over the last 5 years. The consumption of gas in residential sector reached 309 BCF in 2019. The industrial and fertilizer sectors are the other major consumers of natural gas and have seen similar consumption trends over the years.



Source: DG Gas



Source: DG Gas

As evident in chart 5.11, Punjab is the largest consumer of RLNG in the country consuming 900 MMCFD RLNG in 2019 followed by Sindh consuming 81 MMCFD RLNG in 2019. Chart 5.12 shows the sectorial consumption of natural gas in 2019; the power sector is the largest consumer of natural gas both locally produced and RLNG followed by the domestic sector in 2019.

Gas Infrastructure

Pakistan has an extensive gas infrastructure that covers the entire country. The gas infrastructure includes gas transmission and distribution pipelines, LNG regasification terminals and auxiliary equipment and systems.

Table 5.5: Length of Gas T&D Network (Km)				
Province	**Punjab**	**KPK**	**Sindh**	**Balochistan**
Transmission	6,997	1,335	3,819	896
Distribution	90,465	15,371	30,062	6,303
Services	22,278	4,554	8,830	1,798
Total	**119,740**	**21,260**	**42,711**	**8,997**

Source: OGRA

The two LNG terminals are located at PQA, Karachi in the southern province of Sind. The first terminal is operated by Engro Elengy terminals and the second terminal is operated by Gasport Limited. Both terminals have a cumulative capacity of 1,200 MMCFD. Further, a third LNG terminal is expected to be commissioned by 2021. The major gas infrastructure projects pursued by the GOP are listed in table 5.6;

Table 5.6: Gas Pipeline Projects		
Project Name	**Capacity**	**Status**
Turkmenistan Afghanistan Pakistan India (TAPI) Pipeline	1.3 BCFD (Pakistan's Share)	Construction of the Turkmenistan Section underway. Gas Sales Purchase Agreement, Share Holding Agreement, Implementation Agreement, Operations Agreement and Heads of Terms of Host Government Agreement have been signed. Land survey in Pakistan Section in progress. Construction license issued by OGRA. Financial Close expected by end of 2021 followed by start of construction phase. Target completion by 2024.
North - South Pipeline	1.2 BCFD	G2G agreement signed between Pakistan and Russia. The Project will be implemented through Special Purpose Vehicle to be incorporated in Pakistan with equity participation by Pakistan and Russia. Pakistan will have majority shareholding in the Project. Construction license already issued by OGRA. ROW has been approved. Initial working to finalize pipeline route and feasibility study have started. Major project activities will be undertaken by SPV. Target completion by 2023.
Off-Shore Gas Pipeline (OSGP)	0.5-1 BCFD	Inter-Ministerial and inter-corporate MoUs signed between Russia and Pakistan. Preparation of Feasibility Study by the Russian side is in progress.

Source: ISGS

Upstream Oil & Gas Pricing Regime

At present Onshore Rules 2013 are applicable whereas new Offshore Rules 2019 are being formulated. These rules provide regulatory framework for all E&P activities such as bidding, exploration, appraisal, development & production and sales. A Model Petroleum Concession Agreement (PCA) for onshore and a Model Production Sharing Agreement (PSA) for offshore stipulate fiscal incentives and obligations of the parties. The current oil and gas prices offered to producers are as under;

Table 5.7: Producers Gas Pricing ($/MMBTU)

Reference Crude Price $/BBL	40	60	80	100	110
Zone-III	3.9	4.8	5.3	5.8	6.0
Zone-II	4.1	5.0	5.6	6.1	6.3
Zone-I	4.3	5.3	5.9	6.4	6.6
Zone-(1F)	4.5	5.6	6.2	6.7	7.0
Zone-0 Shallow	4.5	5.6	6.2	6.7	7.0
Zone-0 Deep	5.2	6.4	7.1	7.7	8.0
Zone-0 Ultra Deep	5.8	7.2	8.0	8.7	9.0

Source: MOE

Table 5.8: Producers' Oil Pricing $/BBL

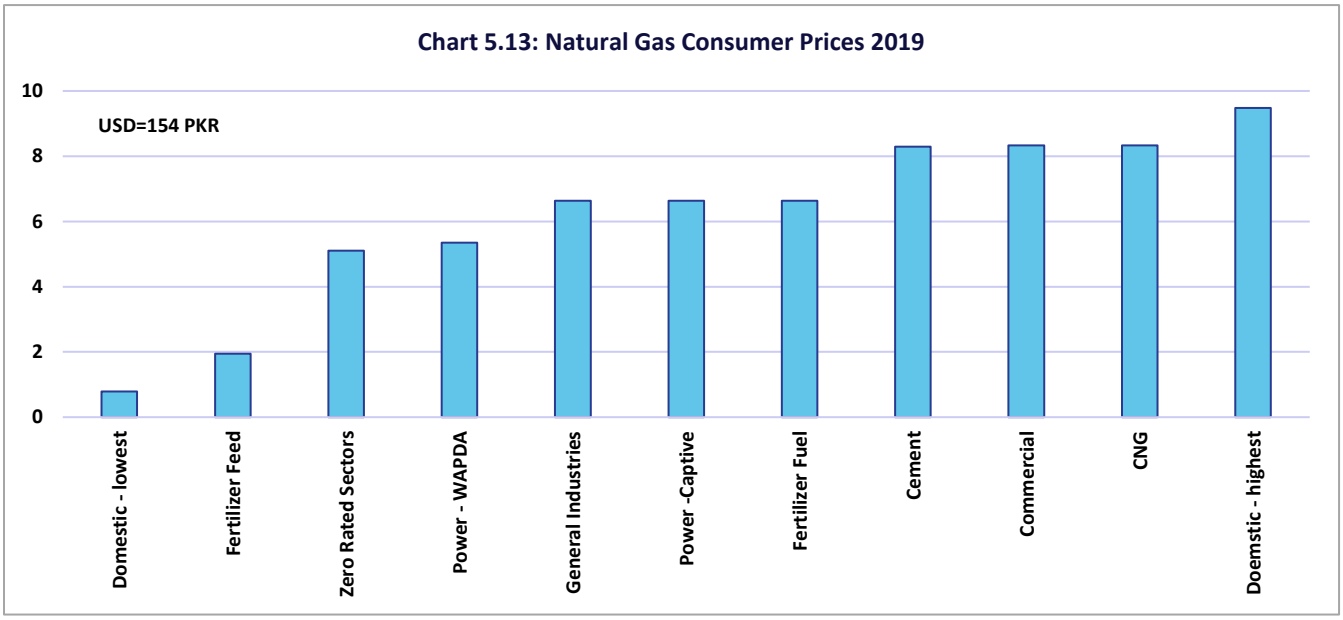
Reference Crude Price	40	60	80	100	110
Royalty @ 12.5%	5.0	7.5	10.0	12.5	13.8
Net of royalty	35.0	52.5	70.0	87.5	96.3
Base Price	40.0	40.0	40.0	40.0	40.0
Incremental Value	0.0	12.5	30.0	47.5	56.3
WLO @ 40% of incremental Value	0.0	5.0	12.0	19.0	22.5

Source: OGRA

New Petroleum Exploration License over Blocks are awarded through competitive bidding process. However, Government of Pakistan may assign the status of Strategic Partner to national oil companies representing a foreign government for grant of Blocks on Government to Government negotiation basis.

Consumer Gas Pricing Regime

Pakistan has a regulated gas pricing regime, wherein, OGRA – the oil & gas regulatory authority is mandated to determine the prescribed gas prices for each category of consumers and the GOP fixes the final consumer gas prices. The gas prices are uniform throughout the country and are inclusive of the following elements; producers' gas price, excise duty, transmission and distribution costs, depreciation, return on assets in line with market financial indicators and gas development surcharge.



Source: OGRA

Consumer Oil Pricing Regime

The price formula for Pakistan's domestic oil products is formulated by ORGA (Oil & Gas Regulatory Authority), established in 2002, to effectively supervise the midstream and downstream of the oil and gas industry in a bid to safeguard the public interest. The pricing mechanism of major domestic oil and gas products is as follows:

- The price of domestic crude oil is correlated to the FOB price of a package of international crude oil, namely Oman mixed crude oil and Dubai crude oil.
- The price of domestic condensate oil is in relation to the price of similar condensate oil in international market.
- Pricing of imported crude oil: Pakistan refineries have concluded long-term commercial agreements with crude oil suppliers such as Saudi Aramco and ADNOC, and the purchase price is FOB.
- The price of domestic refined oil is determined based on the import parity price (IPP) formula of the monthly average FOB of Arabian Gulf (AG).

CHALLENGES FACED BY PAKISTAN OIL & GAS INDUSTRY

To sum up, Pakistan's oil and gas industry basically has a relatively mature system. The price of Pakistan's domestic crude oil and refined oil is correlated to the price of oil in the Middle East market, the price of imported LNG gas is correlated to that of Brent oil, and the price of domestic gas is fixed by the government. Oil and gas exploration and development and construction of infrastructure such as refineries and pipelines, the development of the oil and gas industry faces quite a number of challenges at present:

- Pakistan's major oil and gas fields have embarked on the later stage of development, with their production declining gradually and insufficient resource potential.
- Insufficient financial strength to develop the petroleum sector.
- Technology gaps which require capital and human resource investments.
- Domestic production of crude oil and refining capacity are far less than demand, and a large amount of foreign exchange is spent to import crude oil and refined oil.
- Domestic oil and gas pipeline network requires upgrading.

DEMAND & SUPPLY OUTLOOK

DEMAND & SUPPLY OUTLOOK

DOMESTIC PRODUCTION FORECAST

The mature and large oil and gas fields in Pakistan are gradually entering the later stage of exploitation, while the newly discovered oil and gas fields are all small in scale and cannot sustain make up for the decline in production in mature oil and gas fields, Pakistan's oil and gas production will enter a decline path in the future in the absence of new major discoveries.

The OGRA 'State of regulated petroleum industry' 2018 report projects total gas supply to reach 5,552 MMCFD in 2028 against total gas demand of 6,726 MMCFD translating into a deficit of 2,851 MMCFD. Domestic gas production is projected to reach 1,677 MMCFD in 2028, LNG supply to reach 1,800 MMCFD in 2028, IP gas pipeline to supply 750 MMCFD gas and gas pipeline to supply 1,325 MMCFD gas in 2028.

Pakistan Energy Outlook 2019 (PEO 2019), a publication of the Petroleum Institute of Pakistan, projects an optimistic domestic gas outlook with domestic production reducing to 3,615 MMCFD in 2028, and for Oil supply, Pakistan's domestic crude oil production is projected reducing to 65,000 BPD by 2028. The majority of the oil supply of total oil supply would be made through imports.

Projection

1) Oil Projection

Recently, the Pakistan Oil Companies Advisory Committee (OCAC) revised/updated the forecast of Pakistan's domestic refined oil demand for 2019~2030 with a GDP growth rate of 5% (pre-pandemic). The demand for refined oil in Pakistan by 2030 is 40 MTO, which corresponds to a crude oil demand of 44.45MTO based on the current comprehensive yield of refined oil by domestic refineries of about 90%.

Table 6.1 Forecast of Oil Demand in Pakistan (Unit: MTO)									
Petroleum Products									
Years	JP-1	JP-8 (Defense)	MOGAS	S.K.O.	H.S.D.	L.D.O.	F.O.	Total	Convert to Crude oil
2020	0.769	0.152	8.776	0.120	9.782	0.015	3.600	23.214	25.794
2021	0.777	0.154	9.566	0.120	10.173	0.015	3.600	24.405	27.116
2022	0.785	0.155	10.426	0.120	10.580	0.015	3.600	25.682	28.535
2023	0.793	0.157	11.365	0.120	11.003	0.015	3.600	27.053	30.059
2024	0.801	0.159	12.388	0.120	11.443	0.015	3.600	28.525	31.695
2025	0.809	0.160	13.503	0.120	11.901	0.015	3.600	30.107	33.453
2026	0.817	0.162	14.718	0.120	12.377	0.015	3.600	31.808	35.343
2027	0.825	0.163	16.042	0.120	12.872	0.015	3.600	33.638	37.375
2028	0.833	0.165	17.486	0.120	13.387	0.015	3.600	35.606	39.563
2029	0.841	0.167	19.060	0.120	13.923	0.015	3.600	37.726	41.917
2030	0.850	0.168	20.775	0.120	14.480	0.015	3.600	40.008	44.453

Source: MOE

2) Gas Projection

Under the condition of GDP growth rate of 5%, with reference to the current situation of gas consumption in Pakistan's provinces, the demand for gas in Pakistan's provinces is projected, as shown in Table 6.2.

Table 6.2 Gas Demand Forecasts for Pakistan (Unit: BCF)											
Province	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Punjab	922	968	1013	1066	1119	1176	1236	1299	1363	1434	1508
KPK	95	99	102	109	117	120	127	134	141	148	155
Sindh	667	699	734	770	809	851	893	939	985	1038	1091
Baluchistan	184	194	205	215	226	237	247	261	272	286	304
Other Regions	81	88	92	95	99	106	109	117	124	127	134
Total	**1946**	**2044**	**2146**	**2256**	**2370**	**2487**	**2613**	**2746**	**2887**	**3032**	**3189**
Onshore	1098	1151	1211	1271	1335	1402	1472	1547	1628	1709	1797
Coastal	848	893	935	985	1035	1085	1140	1200	1260	1323	1392

Source: MOE

Total demand for oil and gas

With a GDP growth rate of 5% projected in 2019, the forecast of domestic oil and gas demand in Pakistan from 2019 to 2030 are shown in Table 6.3. Pakistan's domestic oil demand is expected to reach 25.79MTO in 2020, 33.45MTO in 2025, and 44.45MTO in 2030. With an average annual growth rate of about 5%; the natural gas demand is expected to reach 1,946BCF in 2020, 2,487BCF in 2025, and 3,189BCF in 2030. Forecasts would be amended for depressed GDP growth rates expected in the coming years due to the pandemic situation.

Table 6.3 Oil and Gas Demand Forecasts for Pakistan

Year	GDP Growth Rate	Oil Demand		Natural Gas Demand		
		MTO	Growth Rate	MTOE	BCF	Growth Rate
2020	5%	25.79	5.40%	49.6	1946	5.00%
2021	5%	27.12	5.60%	52.1	2044	5.00%
2022	5%	28.54	5.50%	54.7	2146	5.00%
2023	5%	30.06	5.60%	57.5	2256	5.00%
2024	5%	31.69	5.80%	60.4	2370	5.00%
2025	5%	33.45	5.80%	63.4	2487	5.00%
2026	5%	35.34	5.70%	66.6	2613	5.10%
2027	5%	37.38	5.80%	70.0	2746	5.10%
2028	5%	39.56	5.90%	73.6	2887	5.10%
2029	5%	41.92	5.90%	77.3	3032	5.10%
2030	5%	44.45	6.00%	81.3	3189	5.10%

Source: MOE

OIL AND GAS SUPPLY AND DEMAND BALANCE

Oil Supply and Demand Balance – Committed Supplies

As shown in Table 6.4, domestic oil production continues to decrease and demand continues to increase, the gap of Pakistan's domestic oil supply continues to widen. The national gap reaches up to 22.07 MTO in 2020, 30.25 MTO in 2025 and 41.70 MTO in 2030. With the continuous decline of domestic oil production, Pakistan's domestic oil supply gap continues to widen. Pakistan needs to import a large amount of oil to meet domestic demand.

Table 6.4 Oil Demand and Supply Balance Forecasts for Pakistan (Unit: MTO)

Province	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Domestic production	**3.72**	**3.61**	**3.5**	**3.4**	**3.3**	**3.2**	**3.1**	**3.01**	**2.92**	**2.83**	**2.75**
National demand	**25.79**	**27.12**	**28.54**	**30.06**	**31.69**	**33.45**	**35.34**	**37.38**	**39.56**	**41.92**	**44.45**
National gap	**-22.07**	**-23.51**	**-25.04**	**-26.66**	**-28.39**	**-30.25**	**-32.24**	**-34.37**	**-36.64**	**-39.09**	**-41.70**
Punjab	-14.83	-15.65	-16.52	-17.45	-18.45	-19.53	-20.68	-21.92	-23.25	-24.68	-26.22
KPK	0.45	0.32	0.19	0.05	-0.10	-0.25	-0.40	-0.56	-0.73	-0.91	-1.09
AJK	-0.28	-0.30	-0.31	-0.33	-0.35	-0.37	-0.39	-0.41	-0.44	-0.46	-0.49
GB	-0.15	-0.16	-0.17	-0.18	-0.19	-0.20	-0.21	-0.22	-0.24	-0.25	-0.27
FATA	-0.13	-0.14	-0.14	-0.15	-0.16	-0.17	-0.18	-0.19	-0.20	-0.21	-0.22
Sindh	-5.50	-5.88	-6.28	-6.70	-7.15	-7.64	-8.16	-8.71	-9.30	-9.94	-10.62
Balochistan	-1.26	-1.36	-1.46	-1.56	-1.67	-1.80	-1.92	-2.06	-2.21	-2.36	-2.53
Northern gap	-14.95	-15.92	-16.96	-18.07	-19.25	-20.51	-21.86	-23.30	-24.85	-26.51	-28.29
Coastal gap	-6.76	-7.23	-7.73	-8.26	-8.83	-9.43	-10.08	-10.77	-11.51	-12.30	-13.15

Source: MOE

Natural gas production & demand balance – Committed Supplies

The forecast of supply and demand balance is shown in Table 6.5 Domestic natural gas production continues to decrease and demand continues to increase, the domestic gas supply gap continues to increase to 5,049 MMSFD in 2028. As domestic natural gas production continues to decline, Pakistan's domestic gas supply gap continues to increase. Therefore, Pakistan needs to accelerate domestic E&P activities and/or increase the imported gas to meet its gas demand.

Table 6.5 Gas Demand and Supply Scenario (Unit: MMCFD)

Province	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Committed & Anticipated Supply (Indigenous	3534	3321	3509	3343	3133	2860	2592	2353	2145	1897	1777	1677
LNG Supply	600	754	1200	1200	1800	1800	1800	1800	1800	1800	1800	1800
Iran-Pakistan Pipeline	0	0	0	0	0	0	0	0	263	750	750	750
TAPI	0	0	0	0	0	0	0	971	1236	1325	1325	1325
Total Supply (Indigenous & Imported)	**4134**	**4075**	**4709**	**4543**	**4933**	**4660**	**5363**	**5389**	**5550**	**5789**	**5669**	**5569**
Total Demand	**4537**	**4768**	**6917**	**7063**	**7212**	**7365**	**7244**	**7680**	**7850**	**8027**	**8209**	**6726**
Gap without IP, TAPI, LNG	1003	1447	3408	3720	4079	4505	4652	5327	5705	6130	6432	5049
Gap with IP, TAPI, LNG	**403**	**693**	**2208**	**2520**	**2279**	**2705**	**1881**	**2291**	**2300**	**2238**	**2540**	**1157**

Source: OGRA, ISGS

DEVELOPMENT PLAN FOR OIL & GAS INDUSTRY

DEVELOPMENT PLAN FOR OIL AND GAS INDUSTRY

PLAN OBJECTIVE

The plan objective is to identify oil and gas projects, policy incentives and recommendations that are needed in achieving oil and gas demand and supply balance for the future. Table 7.1, provides indications for capacity enhancements of the energy supply chain in the country.

Table 7.1 Planning Objectives of Pakistan's Oil and Gas Industry

Items		2020	2025	2030
Petroleum	Domestic (MTO)	3.96	3.2	2.75
	Imported (MTO)	22.07	30.25	41.70
Natural gas	Domestic (BCF/a)	1282	1091	929
	Imported (BCF/a)	667	1398	2260
Scale of refinery facilities (MTPA)		19.37	38	48
Scale of oil import facilities (MTPA)		51	66	66
Gas Import Facilities	Coastal LNG import facilities (MMCFD)	1200	1800	1800
	TAPI gas pipeline (MMCFD)	0	1236	1325
	Iran-Pakistan gas pipeline (MMCFD)	0	263	750
Oil pipeline capacity from coastal areas to inland areas (MTPA)		18	28	38
Gas pipeline capacity from coastal areas to inland areas (MMCFD)		2400	3600	4800

Source: MOE, ISGS, DGLG

Planning Ideas

1. Short to long term view of the market demand outlook should be taken as guidance.
2. Scientific approach should be taken for pursuing development and ensuring highly efficient utilization of resources and time.
3. Encourage the oil and gas development through incentives, support through resources and knowledge sharing.
4. Stabilize and enhance the domestic oil/gas production, strengthen oil storages/LNG import.
5. Accelerate the oil and gas infrastructure construction facilities i.e. the construction and upgrading of domestic refineries and upgrading of energy structure.
6. Foreign exchange expenditure reduction, the promotion of constant and sound social and economic development.

PLANNING DEPLOYMENT

Exploration & Production

Invigorating Exploration & Production activities

Greater efforts to the on-shore exploration to ensure the reserve replacement; strengthen the comprehensive evaluation and exploration input in areas with gas/oil reserves potential and with lower exploration risk.

Implement the production increasing measures including the potential tapping and EOR in the mature oil/gas fields that have entered the production decreasing phase; encourage the mid-and small-size international oil companies with capital and technical capability to be engaged in oil/gas development in Pakistan by introducing preferential policies; implement EOR measures on mature oil/gas fields that have entered the production decrease phase.

For off-shore oil and gas exploration, the private sector to be encouraged to undertake state-of-the-art geophysical surveys while the government would consider a campaign of mult-client surveys with private sector participation. Private sector may form joint ventures with Pakistani state owned companies to enhance exploration in shallow and deep water off-shore areas with reasonably established geological conditions.

In respect of shale oil and gas exploration and development, develop preferential policies conduct pilot projects as soon as possible, in a bid to encourage domestic and foreign oil and gas companies to enter this field.

Oil Refining

Facilitating the construction of large-scale oil refining facilities

The price of imported crude oil processed into refined oil in Pakistan has a greater advantage than direct import of refined oil, which can save the country a large amount of foreign exchange and drive related industries and social and economic development. Building refineries and oil terminals in coastal areas will shorten the transmission distance of imported crude oil, and reduce investment in ancillary facilities of refineries such as pipelines.

The government would be willing to introduce fiscal and taxation policies if it could attract foreign capital, introduce foreign advanced technologies, and upgrade the construction of large-scale oil refining and chemical facilities in the coastal areas. Moreover, expansion characterized by "intensive scale and park-based industry" of the refining and chemical sector, and gradually replacement of direct import of refined oil by domestic refining of imported crude oil, would result in substantial saving in the fuel import bill in foreign currency and would promote domestic socio-economic betterment.

The development planning of refining facilities is as follows:

First, select a refinery with good economic returns and appropriate conditions to upgrade its technology and upgrade its products through lesser investment.

Meanwhile, accelerate the construction of large-scale refineries in coastal areas to gradually replace the direct import of refined oil with domestically-refined imported crude oil and decrease reliance on import of refined oil.

In the long-term, due to the growth of oil demand in the northern region and the construction of supporting crude oil pipelines, timely consider large-scale refining and chemical integration projects in the inland provinces, so that the domestic total refining capacity can reach 48 MTPA, which basically meets the domestic refining of imported crude oil instead of directly importing refined oil. The locations of the planned construction of the three refineries are shown in Figure 7.1.

Figure 7.1 Planning Locations of Pakistan's Refineries

Oil & Gas Infrastructure

Strengthening the construction of oil and gas import infrastructure

a. Crude oil import facilities

Focusing on the layout of the refining industry, construction of supporting facilities such as crude oil terminals in a bid to resolve the problems of low efficiency and insufficient scale of the existing oil terminals; giving consideration to building oil unloading facilities such as single point mooring near the coastal refineries so as to avoid the berthing of large oil tankers at the ports and reduce the transmission distance.

b. LNG import facilities

Based on the current situation of FSRU based LNG facilities in Pakistan, the development planning of gas import facilities is as follows:

Pakistan's LNG import capacity is likely to increase substantially in the coming years in order to bridge the demand and supply gap. Terminals are preferably to be built near Karachi, so that it can use the existing gas pipeline networks for transmission. For construction of two additional LNG Terminals in the private sector, Ministry of Maritime Affairs has allocated sites in the LNG zone at Port Qasim. Government of Pakistan is interested in seeking investment for onshore LNG terminals.

c. Onshore transnational gas import pipeline

The construction of onshore natural gas pipelines is being promoted vigorously, striving to build the TAPI pipeline by 2024 and Iran-Pakistan pipeline by 2025, so that the import of onshore gas will reach 2,100 MMCFD. Among them, the gas import from TAPI pipeline is 1,325 MMCFD, and the gas import from Iran-Pakistan pipeline is 750 MMCFD.

The location of the planned LNG receiving terminal and onshore gas pipeline is shown in Figure 7.2.

Figure7.2 Planning Location of Gas Import Facilities in Pakistan

Accelerating the construction of oil & gas pipelines and storage projects

a. Oil Pipeline

In accordance with the layout of the refining industry and the development of the inland refined oil market, transportation capacity of existing product pipelines would need to be increased and refined oil pipelines to major oil consumption markets in the north would be built; the necessity and feasibility of building crude oil pipelines from southern ports to northern refineries needs to be studied. By 2030, the transmission capacity of oil pipelines from the southern coastal port to the northern market will reach 38 MTPA. Based on the status of oil pipelines already built in Pakistan, the construction planning of oil pipelines is as follows:

1. Completing the White Oil Pipelines as soon as possible, with the transmission capacity reaching up to 12 MTPA and the total transmission capacity from south to north reaching 18 MTPA;
2. Building a new refined oil pipeline from Karachi to Lahore;
3. Building a new crude oil pipeline from Karachi to Lahore to cater the demand of the new large-scale refinery in the north;
4. In the years when the pipeline transmission capacity is insufficient, transmission by road and railways will be used as supplement.
5. The Machike-Taru Jabba oil pipeline project would be completed, catering the growth of consumer demand in Peshawar, Islamabad and other major cities in the north.

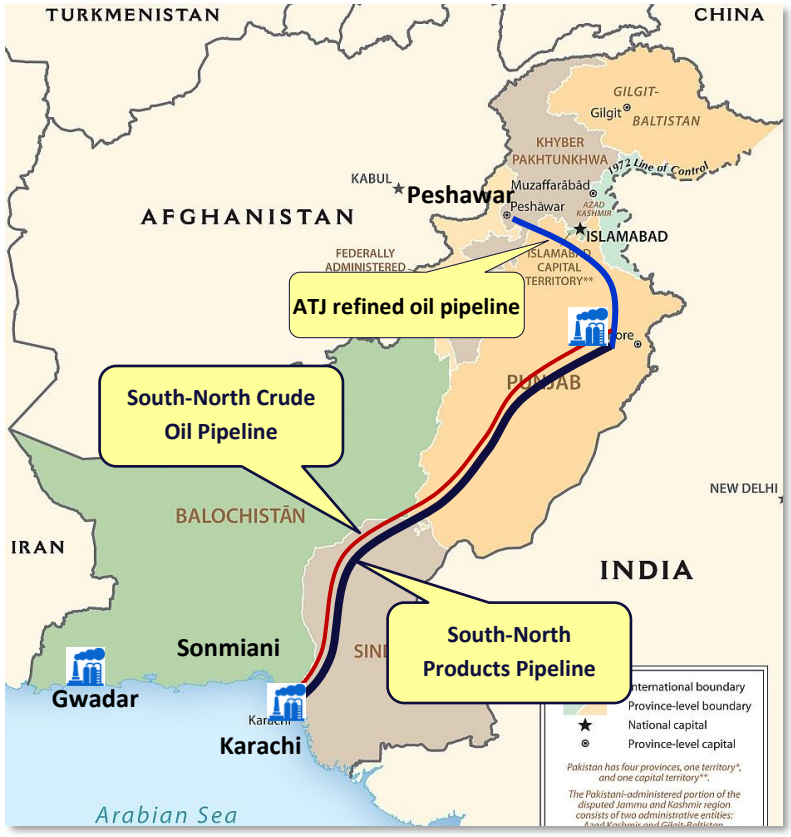


Figure 7.3 Planning Location of Oil Pipelines in Pakistan

b. Gas Pipelines

In order to meet the demand of gas in the country, the following gas pipeline projects are under consideration in the country;

1. TAPI Gas Pipeline Project

- TAPI GSPA was concluded in 2012 under which Turkmenistan will supply 1,325 MMCFD gas for 30 years. A consortium Company namely TAPI Pipeline Company Limited (TPCL) was incorporated in 2014 to undertake the project Development Activities.
- Turkmengaz has been nominated as the Consortium Leader of TPCL in 2015 and will inject 85% of equity in TPCL while rest of the TAPI members namely Afghanistan, Pakistan and India will inject 5% equity each through their designated entities (AGE, ISGS & GAIL). Heads of Terms of Host Government Agreement (HGA) between TPCL and Ministry of Energy (Petroleum Division) has been signed and work on full form HGA is underway.

- Stone laying ceremony of the gas field in Turkmenistan has been held. FEED has been completed and contracts for long lead items have been finalized. Physical work has commenced in Turkmenistan and Afghanistan. Route approval obtained from Ministry of Defense (MoD) and Light Detection and Ranging (LIDAR) Survey is in progress. Approval of environmental authorities of Balochistan and Punjab have been obtained. OGRA has issued Construction and Operation license to Inter State Gas Systems (Pvt) Ltd. Initial land acquisition activities are underway. ISGS has been nominated as Land Rights Entity (LRE) by MOE. Substantial progress has been made by TPCL to secure financing for the Project through international banks, Export Credit Agencies (ECAs), etc. Pakistan has sufficient funds to meet its contractual obligations. Turkmenistan has proposed early implementation of the Project in Afghanistan through Herat Offtake Option, which is under consideration of the Parties.
- Potential Risk: COVID 19 pandemic may cause delay in FID.

2. North South Gas Pipeline Project

- An Inter-Governmental Agreement (IGA) was signed on 16th October 2015 between the Russian Federation and Pakistan for development of the NSGP Project having transmission capacity of 1.2 BCFD from Karachi to Lahore.
- Pakistan has proposed some amendments in the IGA to implement the Project on EPC model with majority shareholding of Pakistan. Russia will nominate sanction-free entity to partner with Pakistan in the Project.
- The Project will be undertaken through Special Purpose Vehicle to be incorporated in Pakistan.
- The Project has achieved significant progress including the following;
    - Route corridor is final and approved by Ministry of Defence.
    - OGRA licence for Construction and Operations issued.
    - Technical consultant is being mobilized to finalize the route, undertake feasibility study, collect land data of the entire route for land acquisition, and conduct Environmental and Social Impact Assessment study.
    - ISGS has started building up its team to start land acquisition activity.
- Potential Risk: Approval of sanction free Russian nominated Company.

Figure 7.4 Planning and Construction Location of Gas Pipelines in Pakistan

STRATEGIC STORAGES

Strategic Oil Storage Development

- As per prevailing policy of the Government, every Oil Marketing Company is required to construct/develop minimum storage of 20 days of its proposed sales, as infrastructure prior to beginning sales in the country, and ensure to maintain the requisite storage capacity to meet its requirements across the country.
- Oil storage infrastructure development falls in the domain of OGRA under the OGRA Ordinance 2002 and the rules made there under. Accordingly, licenses for construction and operation of oil storage facilities from OGRA are a basic requirement.
- No strategic storages have been developed in the country though the Federal War Book 1983 requires maintaining strategic reserves equivalent to 45 days demand at national level.
- Presently, Oil Marketing Companies are obligated to maintain stocks equivalent to 20 days demand on commercial requirements basis.
- Diesel and Petrol are the major products, which contribute around 80% of the total requirement in the country. Accordingly, the potential storage capacity of HSD and MS available, as per actual consumption for 2018-19, with the OMCs and additional storage required to acquire 20/45 days cover on provincial basis is worked out as follows:

Province	Table 7.2: HSD Storage in the country					
	Annual Demand	Daily Demand	OMCs Storage**	Existing Days Cover	Required Storage for 20 Days Cover	Required Storage for 45 Days Cover
Punjab	4,586,000	12,564	406,000	32		159,000
KPK/AJK/ GB/FATA	998,000	2,734	27,000	10	27,000	96,000
Balochistan	80,000	219	9,000	41	-	1,000
Sindh (Inc: Karachi)	1,691,000	4,633	355,000	77	-	-
Sindh (Exc: Karachi)	1,052,000	2,882	15,000	5	43,000	115,000
Pakistan (Total)	7,355,000	20,151	797,000	40	70,000	371,000

*** Includes storage available in pipelines.*

Province	Table 7.3: MS Storage in the country					
	Annual Demand	Daily Demand	OMCs Storage	Existing Days Cover	Required Storage for 20 Days Cover	Required Storage for 45 Days Cover
Punjab	4,992,000	13,677	151,000	11	123,000	464,000
KPK/AJK/ GB/FATA	819,000	2,244	8,000	4	37,000	93,000
Balochistan	128,000	351	5,000	14	2,000	11,000
Sindh (Inc: Karachi)	1,651,000	4,523	257,000	57	-	-
Sindh (Exc: Karachi)	725,000	1,986	15,000	8	25,000	74,000
Pakistan (Total)	7,590,000	20,795	421,000	20	187,000	642,000

*** Includes storage available in pipelines.*

- Based on the above information, an additional storage capacity of around 370,000 MT for HSD and 650,000 MT for MS is required at up-country locations especially in Punjab and KPK/Northern Region in order to potentially enhance storage cover to around 45 days.
- Government may therefore, consider the possibilities of strategic oil storage development through joint ventures with local and international investors.

PLANNED OIL AND GAS PROJECTS

a. Upcountry Deep Conversion Oil Refinery and Crude Pipeline:

- Proposal for setting up of a 250,000-300,000 barrels per day (bpd) oil refinery at upcountry location near Lahore along with crude transportation pipeline from Karachi has already been shared with Chinese side.
- In this regard MOU was signed in April 2018 between PSO and Power China to undertake financial and economic feasibility of the project under Public-Private Partnership (PPP) Model. The project is under study by PSO and Power China.

b. Petroleum Exploration Blocks

- Pakistan has total sedimentary basin of 827,268 Sq.KM out of which only 27% area is under exploration. Since inception, a total of 2,528 wells have been drilled which shows a drilling density of 3 well per 1,000 Sq.KM. To increase the indigenous oil and gas production, the Government has promulgated a robust and dynamic Petroleum Policy which offers very attractive incentives for petroleum exploration and production companies. The Policy is being further improved to enhance exploration in unexplored frontier regions. The Policy envisages award of Onshore and Offshore E&P rights via following three distinct procedures:

  i. The granting of Petroleum Exploration Licenses for entering into Petroleum Concessions Agreement (PCA) or Production Sharing Agreement (PSA) in relation to onshore and offshore blocks offered respectively, through competitive bidding as per procedure laid down herein below.

  ii. The granting of Petroleum Exploration Licenses for entering into PCA or PSA in relation to onshore and offshore blocks respectively, without competitive bidding to Strategic Partner Companies on Government to Government basis.

  iii. The granting of non-exclusive Reconnaissance Permits for undertaking studies and multi-client surveys after direct negotiation.

Government of Pakistan is preparing to undertake a bidding round for award of following 20 new petroleum exploration blocks by the end of this year. Additional blocks are also being cleared for offering in subsequent phases. The details and applicable Policies/Rules/ Model PCA/PSA can be accessed through following web link http://www.ppisonline.com/.

Table 7.4: 1st Bid Rounds Blocks			
S.No.	**Block Name**	**Area Sq. Kms**	**Districts**
1	3069-9 (Suleiman)	2172.89	Musakhel, Zhob, Killa Saif Ullah & Loralai
2	3068-6 (Killa Saifullah)	2421.96	Killa Saifullah
3	3068-10 (Block-28 North)	637.05	Loralai & Kohlu
4	2762-2 (Desert)	2231.3	Washuk & Chagai
5	3067-7 (Sharan)	2497.89	Killa Saifullah & Zhob
6	3372-25 (Abbotabad)	2298.67	Haripur, Mansehra & Abbotabad
7	3170.11 (D.I.Khan West)	311.55	D.I.Khan, F.R. D.I.Khan
8	3471-1 (Nowshera)	1711.06	Charsada, Mardan, Nowshera & Swabi
9	3372-26 (Hazro)	653.74	Haripur, Swabi & Attock
10	3273-5 (Jhelum)	1524.65	Jhelum, Gujrat & Mandi Bahauddin
11	3372-27 (North Dhurnal)	56.18	Attock
12	3072-9 (Okara)	2492.48	Sahiwal, Okara,Toba Tek Singh, Faisalabad & Khanewal
13	3171-2 (Nurpur)	518.19	Khushab & Bhakkar
14	3272-16 (Lilla)	2361.12	Chakwal, Jhelum & Khushab
15	2972-7 (Vehari)	2487.28	Bahawalpur, Vehari & Lodhran
16	2972-8 (Sutlej)	2312.56	Bahawalnagar, Bahawalpur, Vehari & Khanewal
17	2770-4 (Islamgarh)	2229.51	Bahawalpur, Rahimyarkhan
18	2668-23 (Khewari East)	1451.23	Khairpur
19	3068-9 (Nareli)	2414.95	Loralai, Sibi & Harnai
20	2467-17 (Sujawal South)	1914.1	Sujawal

Source: DGPC

In order to attract investment in carrying out large scale G&G surveys, it is proposed that E&P sector may be brought under the ambit of CPEC. Chinese exploration and production companies are encouraged to participate in the bidding round either directly or in a joint venture with any other company including the three major Exploration and Production Companies namely Oil and Gas Development Company Limited (OGDCL), Pakistan Petroleum Limited (PPL) and Mari Petroleum Company Limited (MPCL). Chinese companies may also consider to become joint venture partners in any of the existing blocks subject to agreements with with the companies. Government of Pakistan can assign the status of "Strategic Partner" to Chinese national oil companies for giving privileged award of petroleum rights without following competitive bidding for certain blocks on mutually acceptable terms and conditions.

In addition, Chinese companies may also obtain non-exclusive Reconnaissance Permits for undertaking studies and multi-client surveys after direct negotiation. The entire open area of above 600,000 Sq.KM is available and Chinese companies may apply for non-exclusive permit on certain areas for specific period for undertaking multi-

client seismic surveys which can be marketed to exploration and production companies. Any model for sharing of revenues accruing from sale of data obtained in such non-exclusive petroleum rights, can be discussed and agreed with the Chinese companies.

Benefits

There could be a number of benefits for both, Pakistan and China if this proposal is actioned:

Benefits for Pakistan: (i) focus will be on frontier and low activity areas and any breakthrough in these areas can be transformational; (ii) risk of an unsuccessful effort will be picked up by the Chinese NOCs; (iii) even if no significant breakthrough happens, new data will be used for future G&G evaluations by other IOCs and NOCs; (iv) domestic G&G sector will see influx of Chinese service sector companies which can help bring down cost of doing business in Pakistan; and (iv) with increased level of activity in new frontier areas, there will be more interest among local as well as foreign E&P companies (other than Chinese) to invest in these unexplored regions.

Benefits for China: (i) Chinese NOCs will be able to get exploration acreage without getting into the bidding process (G2G basis) on a mutually agreed work program; (ii) Chinese technology and its service sector will have easy access to Pakistan market; and (iii) CPEC projects are provided security cover by GoP and this lowers the cost for Chinese NOCs.

Table 7.5: Exploration Activities

Sr. No.	Concession /Date of Grant	District	Work Done	Current Status
1	**Saruna 17-02-2004**	Khuzdar, Lasbela	Data Purchased from LMKR; Reprocessed some of the data. Identified a viable prospect.	Force Majeure w.e.f. 30.03.2015 Plan to acquire 250 L.kms 2D data & drill exploratory well Chappar-1 Expl well marked on ground. Civil works will start after security clearance/cover.
2	**Kohlu 29-12-2004**	Kohlu, Dera Bugti and Barkhan	Geological map based on satellite images. Planned to acquire 350 L.Kms 2D seismic data.	Plan to outsource. Press tender were advertised on April, 17, 2020 with bid submission date of 18 April, 2020 for 634 L. Kms 2D Seismic data acquisition.
3	**Shahana 29-12-2004**	Kharan & Panjgur	157 L. Kms 2D acquired (2016) & processed. Geological Field Work completed. Gravity & Magnetic survey completed.	Interpretation of the acquired 157 L. Km 2D seismic data is in progress. Procedure for out sourcing re-processing to advance level of 157 L.km seismic data is in progress.
4	**Latambar 24-10-2005**	Bannu, Tribal Area adjacent Bannu	Geological Field Work completed. 228L. Kms 2D seismic data acquired & processed (2016). Interpretation is in progress.	Currently combined interpretation of Latambar with newly acquired 2D and 3D data in blocks surrounding Latambar E.L i.e Bannu West and Nashpa West is in progress.
5	**Shaan 12-07-2007**	Qila Saifullah, Zhob & Musa Khel Bazar	Geological Field Mapping 513 L. Kms 2D seismic data (2016-17).	Re-Processing & interpretation of acquired 2D seismic data are in progress.
6	**Samandar 06-07-2005**	Awaran & Uthal	412 L. Kms 2D seismic acquired (2016-17) & processed.	To confirm / validate the current interpretation additional 250 L.Km 2D seismic data acquisition is planned to be acquired in FY 2020-21.

			Geological Field Mapping. Interpretation is in progress.	
7	**Ranipur 10-02-2014**	Larkana, Khairpur & Nausherofero z	2672 Sq. Kms 3D seismic acquired (2016) & processed. 3 Exploratory wells drilled. Ranipur-1, Metlo-1 & Jatoi-1 Interpretation is in progress.	Exploratory Well Jatoi-1 is under drilling. Merging of 3D seismic data is in progress.
8	**Palantak 20.03.2014**	Washuk & Panjgur	344 L. Kms 2D seismic acquired (2016) and processed. Interpretation of 2D seismic is in progress.	Out sourcing of re-processing to advance level of 344 L.Kms seismic data is in progress.
9	**Kharan-3 21.03.2014**	Kharan & Naushki	382 L.Kms 2D seismic acquired (2017) and processed.	Interpretation of 2D seismic is in progress.
10	**Gwadar 21.03.2014**	Gwadar & Kech	Planned 650 L.Kms 2D seismic acquisition.	As per plan, OGDCL's own Seismic party will shift to acquire 2D Seismic expectedly in September 2020
11	**BelaNorth 21.03.2014**	Khuzdar, Awaran & Lasbela	Planned 300 L.Kms 2D seismic acquisition	OGDCL's own Seismic Party (SP-4) is acquiring 2D seismic data in the Block
12	**Bostan 21.03.2014**	Ziarat, Pishin, Killa Abdullah & Quetta	Geological Mapping completed. 2D seismic data acquisition is in progress.	613 L. Kms 2D seismic data acquisition is in progress by OGDCL's own seismic party (SP-1).
13	**Khuzdar North 21.03.2014**	Khuzdar	530 L. Kms 2D seismic acquisition planned & is under acquisition	530 L. Kms 2D seismic acquisition is in progress by SINOPEC.
14	**Tirah 21.03.2014**	Khyber, Kurram & Orakzai agency	Geological field work completed. 435 L. Kms 2D seismic acquisition planned.	Orakzai/Tirah combine 2D seismic data acquisition is in progress by OGDCL's own seismic party (SP-3).
15	**Zamurdan**	Relinquished w.e.f. 24-11-2007		
16	**Channi Pull**	Relinquished w.e.f. 15-02-2016		

Source: OGDCL

c. Coal to Liquid Technology Project in Thar Sindh

A Chinese company has offered setting up a Coal to Liquid (CTL) Plant using indigenous lignite coal of Thar in the province of Sindh, Pakistan. Ministry of Energy, Petroleum Division in principle agrees to play the role of facilitator.

- The project using the indigenous coal of Thar will help generate employment in the area besides addressing energy security of the country.
- The technology is proven and time tested and project would be economically viable.
- They will not seek any sovereign guarantee from the GOP and would like to set up the plant in partnership with local Pakistani group.
- The quality of fuel will be of Euro-V specifications.
- The licensing of exploration, production of coal and subsequent leasing of Thar Coal blocks constitutionally fall in the domain of the Government of Sindh.
- CTL project may be got included in the CPEC framework being a potential investment opportunity in Pakistan.

AGREED OIL AND GAS PROJECTS

a. Pakistan Refinery Limited Upgrade Project

Pakistan Refinery Limited (PRL) is one of the leading petroleum refinery in the country which was established in 1962 as a Joint Venture (JV) of major Oil Marketing Companies (OMC's), currently the majority shares (~53%) are held by Pakistan State Oil (PSO). PRL since its inception is one of the principal manufacturers and suppliers of petroleum products to domestic markets.

PRL is a simple hydro skimming refinery, having a capacity of 50,000 BPSD, with plans to upgrade to a deep conversion refinery. The existing four processing units within the refinery are:

Crude Distillation Unit	Hydrotreating Unit (Kero minus stream)
Platforming Unit	Isomerization Unit

Refinery processes a variety of imported crudes from ADNOC, UAE and indigenous crudes. Refinery has recently entered a contract to purchase and process ARAMCO Arab Light crude. Current product slate at 100% capacity comprises of:

- Furnace Oil (FO, ~ 40%)
- Kerosene (~5%)
- Motor Spirit (MS 90, 15%)
- Liquid Petroleum Gas (LPG, 0.5%)
- High Speed Diesel (HSD, ~25%)
- Jet Fuels (JP-1 & JP-8, 8%)
- Naphtha (Export only, 4%)

1. PRL Upgrade Project Objectives

In 2016 PRL undertook a detailed feasibility study with Amec Foster Wheeler for an expansion and upgradation of the refinery. Marketing/pricing scenarios were arranged from M/s Wood Mackenzie.

The main objectives of the study were to generate solutions and alternatives for:

- Regulatory compliance; with regards to EURO II (500 ppm Sulphur) in HSD and overall improvements in product qualities (Cost estimate USD 1 -1.2 billion as Phase 1); alternatively, expansion from current 50,000 BPSD to 100,000 BPSD with full conversion (Cost estimate in excess of USD 2 billion);
- Design to cater the requirements of future product specifications (EURO IV);
- Upgradation by converting Fuel Oil into MS and HSD, to improve profitability and import substitution; and
- Maximize return on investment and making it self-sustainable - without any government support.

2. Project Advantages

PRL Upgrade project meets the government's stipulation of converting existing hydro-skimming refineries into deep conversion refineries on business case basis, as well as because of following advantages:

- Import substitution of refined petroleum products & light crude, saving of ~USD 180 - 200 million per annum in the first phase without any expansion. With expansion, import substitution will be in excess of USD 400 million.
- Zero dependence on any government subsidies in the post-project period.
- Contribution towards 'human resource development' after the induction of state-of-the-art refining technologies.
- Creation of job opportunities for young professionals.
- Hundreds of downstream industries to gain long term benefits from the development.
- The current refinery site has ~100 acres of unutilized land to accommodate the project.
- Presence of critical infra-structure particularly pipelines connectivity with the Karachi Port, upcountry white-oil pipeline and Karachi Airport.
- Adequate tankage for both crude & products.
- Availability of well-trained technical & professional workforce.
- Long term product upliftment contracts with Pakistan State Oil (PSO) and Shell Pakistan.

3. Current Project Status

In the light of discussions in the Sub Group on Oil and Gas Working Group on Energy in November 2019, it was directed that PRL Upgradation Projects will be pursued on 'Business to Business' basis and then to be presented for further necessary approvals under CPEC.

PRL since then has been in contact with prospective Chinese Companies who are interested in EPC-F contracts. However, no progress was made on PRL upgradation project since end of January, 2020. Despite that PRL is maintaining contacts with prospective Chinese companies to re-engage as soon as current situation normalizes.

4. Project Timeline

Phase	Tentative Duration
FEED	18 months
EPC	42 months
Total Schedule	60 months (5 Years)

PLANNING RISKS

Demand-supply forecast sensitivities: Demand projections are predominantly based on conventional primary fuels linked with forecasted GDP rates. Energy supply projects have been planned to balance the gap between demand and supply for a growing economy. Post pandemic economic shock persisting till 2021 the GDP is likely to gradually rebound to 5% rate as macroeconomic imbalances are corrected.

Country Monetary Policy: Policy measures toward fiscal consolidation and monetary tightening have been implemented. After raising the policy rate to 13.25% in 2019, the State Bank of Pakistan reduced it in 4 steps to 12.50%, then to 11.00% then to 9.00% and then to 8.00% till May 2020. Monetary Policy is expected to be tight for investment to receive a boost from the implementation of critical structural reforms underway to help contain currency depreciation and improve energy production as well as the overall business climate. Moody's recent upgrade of Pakistan's credit rating outlook from negative to stable should enhance investor confidence.

Competing technologies: The Government approved the National Electric Vehicles Policy (NEVP) in November 2019, which targets and provides incentives aimed at electric vehicles capturing 30% of all the passenger vehicle and heavy-duty truck sales and motorcycles and busses capturing 50% sales by 2030. These ambitious targets would shift the fuel mix from the motor spirit and diesel component of primary fuels running vehicles to production of final energy (power) for running electric vehicles. This would also help Government achieve environmental objectives.

Exploration risk: E&P is inherently high-risk high-reward business. Pakistan is fortunate to have discovery ratio of 1:3 with vast unexplored onshore and offshore basin areas. Not included in the production forecast is the huge potential of unconventional gas and oil. Exploratory failures are therefore manageable as the reward is overwhelming in terms of increased domestic production coupled with the vast existing and planned oil and gas infrastructure for faster and economical monetization or discoveries.

POTENTIAL PROJECTS OF PETROLEUM DIVISION

a. Parco Coastal Refinery Limited

Pakistan is a fast-growing market, with a population base of ~220 million people consisting of a significant youth demographic that is entering the workforce and number of major infrastructure development projects are underway. Consumption of refined/petrochemical products have seen double digit growth rates in recent years, including import of ~10 million tons per annum of refined fuels (i.e. mostly mogas and diesel) and Import of ~2-3 million tons per annum of high-value petrochemical-based products.
The country is being geared to becoming a major industrial and consumer goods hub and has the potential of being a huge captive market with significant potential for investment in major energy/refining/petrochemical projects.

About PARCO and PCRL
Pak Arab Refinery Limited (PARCO), is a Joint Venture between the Government of Pakistan (60%) and Emirate of Abu Dhabi (40%), through its Mubadala Investment Company. PARCO Costal Refinery is 100% subsidiary of Pak-Arab Refinery Limited. PARCO Coastal Refinery Limited (PCRL) project, is a proposed 250 to 350 kbpd deep conversion, integrated refinery-petrochemical complex with marine facilities. PCRL will be Pakistan's largest industrial project to be located in coastal area of Baluchistan near Hub.
PCRL will be a significant addition to Pakistan's oil refining infrastructure, focused on the domestic market. The project will meet growing domestic demand for refined fuels and petrochemical demand and lead to various socio-economic benefits for the country.

Project Salient Features

The PCRL project will result in socio-economic development in underdeveloped area of Baluchistan and contribute to national economy over the life of project. Some of the Key Salient Features are described below:

- The selected Process configuration is based on modern technology designed for deep conversion with maximum output of high value Refined fuels and Petrochemical products for the domestic market.
- The Project will have a dedicated SPM for importing over upto 15 million tons/year of crude oil, relieving Ocean tanker congestion calling at existing ports (i.e. Karachi Port and Port Qasim). The SPM facility will be designed to berth VLCC Tankers.
- The project will be linked via a dedicated pipeline by Pak-Arab Pipeline Company (PAPCO) to the existing White Oil Pipeline system for transfer of white products (Motor Gasoline and High-Speed Diesel) to upcountry locations.
- The project will develop 20 million barrels storage facility for crude oil, refined products, and petrochemicals.
- Development of downstream, allied sectors and small & medium enterprises.
- Socio-economic development of underdeveloped area Baluchistan (local community, infrastructure & services)
- Enhanced confidence for local and international investments in the Country.

Project Current Status

The following steps have been carried out:

- Refinery configuration study by Honeywell (UOP, USA).
- Execution strategy and Governance structure has been approved.
- PCRL incorporated as separate entity.
- Project site studies have been completed including land survey, Hydrology study, geotechnical offshore investigation, offshore data acquisition etc.
- TechnipFMC (UK) appointed as the Project Management Consultant.
- Project Organization has been developed and relevant resources engaged.
- Allen & Overy appointed as International Legal Advisor.
- Process Licensor Strategy finalized, and International Process Licensors have been Technically qualified and shortlisted for refinery project. Commercial Procedures and draft Agreements for Process Licensors have been negotiated and finalized.
- The Front-End Engineering Design (FEED) Contractors have been shortlisted. ITBs are ready to be issued.
- The Environmental Impact Assessment (EIA) Contractors have been shortlisted. ITBs are ready to be issued.
- Government has allocated 1811 acres of land. Acquisition of additional 1000 acres of Land is underway.
- Construction of Boundary wall for securing the Project Site is underway.
- A Revised Feasibility Study for integrated Refinery Petrochemical Project is being undertaken through an International Consultant.
- Board of Directors in the last Board meeting held on October 8th, 2020, allowed to reinitiate the project activities.

SITREP

Local administration is in contact to provide support for the construction of the PCRL Site. PARCO has its own security arrangement available to provide support for the construction. Two major Industrial units i.e. HUBCO and BYCO are also operating in the vicinity of approx. 10km with their security arrangements as well. There is no imminent challenge from any subversive elements. The project activities including construction of Boundary Wall are expected to resume from November 2020.

Way Forward

The PARCO Board of Directors see this as a prime investment opportunity and would like to partner with international companies with experience in executing large oil and gas sector projects to develop Pakistan's largest integrated refinery-petrochemical project. We are of the firm view that participation of a partner in the PCRL refinery project, will not only add value to the project in financial, technical and management aspects, but they will also benefit from PARCO's on-ground presence and progress made till date.

b. A National Seismic of Sedimentary Area to seek Chinese Equipment, Crews & Expertise:

Since Pakistan came in to being, Pakistan oil & gas companies are actively exploring the country for hydrocarbons. As shown in the attached map, most of the activities have taken place in the Lower Indus Basin (Offshore, Sindh & lower part of Punjab province), middle Indus basin (Middle Punjab and lower KPK). The new exploration interest for most of the E&P companies lies in the upper Indus basin (Mid & Upper KPK and Upper Punjab). However, Baluchistan basin and Pishin basin is among the least explored areas in Pakistan.

Till date, 1043 surveys have been performed which consist of 923 seismic 2D surveys while 120 seismic 3D surveys have been acquired. We can further divide this onshore and offshore, thereby, onshore 263007 lkm of 2D seismic data has been acquired and 57229 sqkm of 3D seismic data has been acquired as well. While on offshore 90514 lkm of 2D seismic data and 13121 sqkm of 3D seismic data have been acquired. These statistics are according to the database maintained by Government of Pakistan.

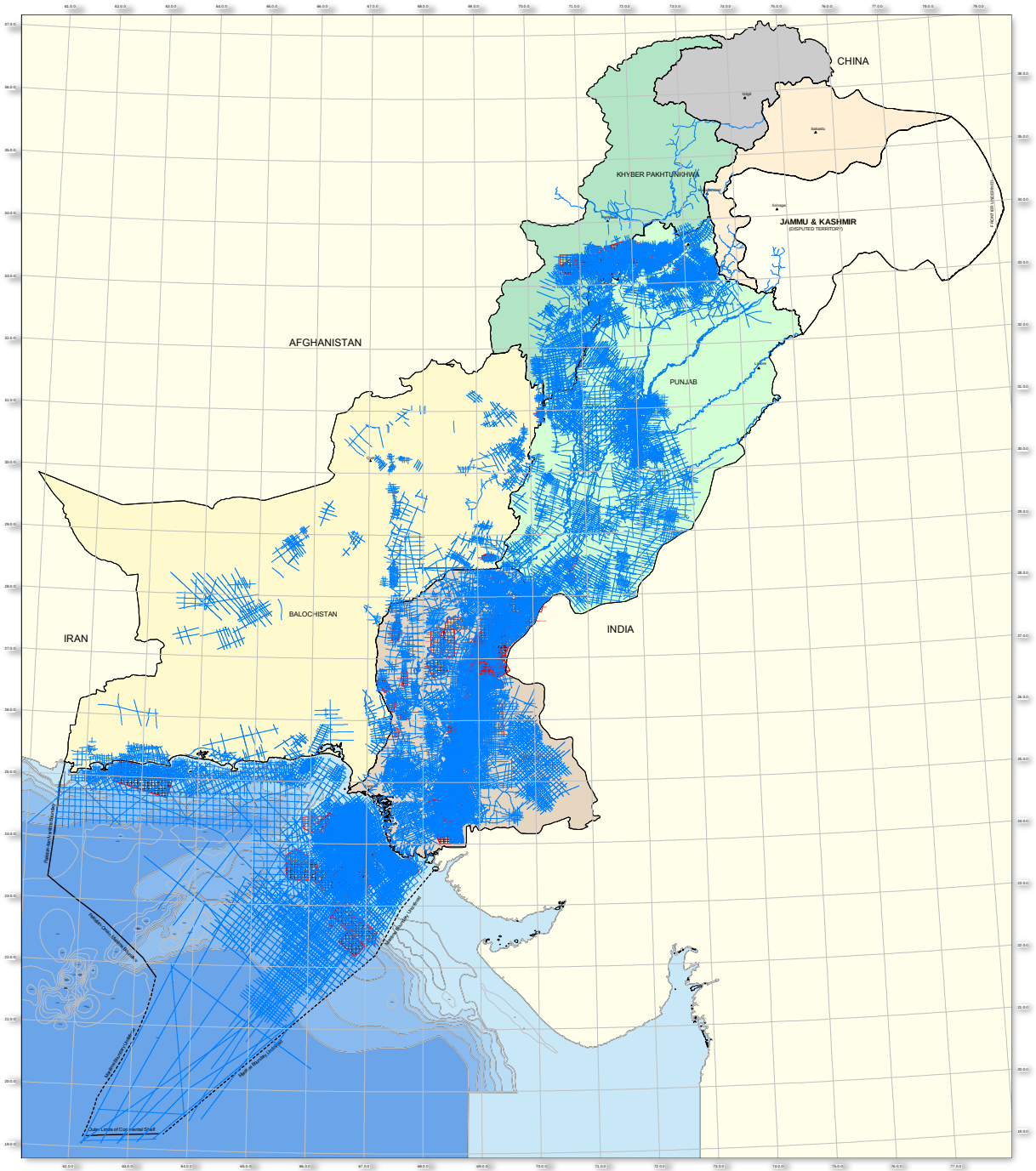
With reference to attached map, frontier areas still exist which require in depth exploration to open up new ventures. Geographically, these areas consist of Baluchistan, Upper parts of KPK, FATA, Upper Punjab. Partial coverage of offshore basin is also present towards the Indian side (Indus delta) whereas, there is requirement of acquiring more data in deep sea towards Markan offshore.

Recommendations

Therefore, having seismic data in these regions will allow delineating subsurface structure ensuring to establish and confirm the subsurface understandings of geology and structure. Thereby, companies may benefit from having some kind of subsurface information, especially in frontier areas, which may lead to invest in drilling a well.

With advancements in technology, advanced interpretation techniques are heavily dependent on the data available and what advanced technologies being used to acquire the data. Thereby, once planning new seismic surveys where no previous data is available; it is wise to opt the following most advanced techniques available for seismic data acquisition which allow generating high-resolution data as compared to the acquisition techniques 15 to 20 years back.

- Wide Azimuth Acquisition
- Wide Angle Acquisition


CHINA
KHYBER PAKHTUNKHWA
JAMMU & KASHMIR
(DISPUTED TERRITORY)
AFGHANISTAN
PUNJAB
BALOCHISTAN
IRAN
INDIA

c. Joint Prospecting, Exploration, Development and Marketing of Metallic Mineral

Pakistan Metallic Mineral sector offers plausible opportunities for revenue generation and growth. Particularly, the Province of Balochistan is host of number of the metals having high economic value. The table as follows provides the metallic mineral potential of the country:

S.No	Metal Mineral	Known Metal Resources	Location	Estimated Revenue Potential based on LME Prices US$
1.	Copper	5,000 Million tons	RikoDikBalochistan	6,399/Ton (99.7% pure metal)
		120 Million tons	Waziristan KPK	
		412 Million tons	SaindakBalochistan	
2.	Chromite	0.6 Million tons	Waziristan KPK, Besham, Chilas	450/Ton (46% Ore)
		3.6 Million tons	Muslim BaghBalochistan	
		0.03 million tons	RasKoh, ChagaiBalochistan	
3.	Lead-Zinc	23.72 Million tons	Overall reserve in Pakistan	Lead: 1,835/Ton (99.7%) Zinc: 2,206/Ton (99.7%)
4.	Lead-Zinc	10.29 Million Tons	Duddar, Balochistan	
5.	Gold	1656 Tons	Saindak, RecoDiq	1,950/Ounce
6.	Manganese	0.5 Million Ton	Abbottabad, Lasbela, Khuzdar	120/Ton
7.	Iron	350 Million tons	KalabaghMianwali	107/Ton (62% Ore)
		110 Million Tons	Kirana Sargodha	
		27.46 Million Tons	Chiniot	
8.	Iron	1427.2 Million tons	Overall reserve in Pakistan	

Pakistan Mineral Development Corporation Pvt. Ltd (PMDC) is 100% owned by Government of Pakistan (GoP) and engaged in prospecting, exploration and evaluation of economic mineral deposits, preparation of techno-economic feasibilities, mining and marketing activities.

PMDC operates 5 Rock Salt projects with 40% of Market Share, 3 Coal projects with 10% share and is also a non-operating joint venture partner in Duddar Lead-Zinc Project with Metallurgical Corporation of China Ltd. The Duddar Lead - Zinc Project is located in Kanraj Valley, District Lasbela, Balochistan.

As a business approach, PMDC is focusing on high value metallic minerals business. Recently, Government of Balochistan (GoB) and GoP have formed Balochistan Mineral Exploration Company (BMEC) in which GOP has initially 10% stake through PMDC. PMDC has successfully programmed its stake in the very high potential business venture.

PMDC is also actively pursuing new leases of Chromite, Lead-Zinc and Copper in Balochistan as well as Copper lease in province of Khyber Pakhtunkhwa.

The Duddar Lead-Zinc project is a symbol of success in Pakistan's metallic minerals sector achieved in collaboration with Chinese expertise and investment. PMDC believes that this success story may be replicated

by support and expertise of Chinese companies in Large Scale Mining (LSM) of minerals potential of Copper, Lead-Zinc, Chromite etc. While the CPEC extends through longitudinal route from Pak-China Border upto the Gwadar, the stretch covers or passes nearby the areas in the Balochistan having rich metallic mineral base.

The projects of LSM under CPEC are likely to return business value for participating companies. Such projects are expected to involve local population by enhancing opportunities of livelihood and socio-economic upliftment. The local involvement in such economic activities will also help additional local support to other CPEC projects and activities in the region.

The opportunity is in Business alliances/JVs for prospecting, exploration, development and marketing of metallic mineral potential. PMDC therefore would request that the proposal of joint prospecting, exploration, development and marketing of metallic mineral potential may be shared with Chinese side for possible implementation under CPEC umbrella.

d. Strategic Underground Gas Storage System

Government of Pakistan is implementing various gas transmission pipeline projects such as North South Gas Pipeline Project, Turkmenistan-Afghanistan-Pakistan-India (TAPI) etc in order to meet growing energy demands. Currently, the growing energy demands of Pakistan are being met through import of LNG from Qatar and other countries.

Transportation of natural gas through high pressure pipelines can be interrupted for various reasons, causing huge losses of production in the downstream industry. Underground gas storages can provide the short-term standby reserves to mitigate such risks of interruption in supplies until the main stream supplies are restored or to meet fluctuations in demand such as winter peak slaving.

The Underground natural gas storage facilities are crucial for the country in view of committed supplies of imported gas under the international gas agreements and fast-growing gas demands in the country to keep pace with the economic progress. The Project would also significantly enhance Pakistan's capability to import gas and ensure sustainable economic growth.

ISGS through an international consultant carried out a feasibility study for the construction of Strategic Underground Gas Storages in 2007. The consultant recommended conversion of two gas fields i.e. Khorewah and Bukhari in Sindh to gas storage reservoir.

Unfortunately, with decline in indigenous gas and growing unfulfilled energy need in the country, the progress on the project stalled. Moreover, sanctions on the importing gas from Iran further deferred the development of said infrastructure. Development on the project was not progressed during 2010-2017 due to non-availability of excess gas.

Within the framework of transactional assistance provided by the Asian Development Bank (ADB) for the Government of Pakistan to update an already prepared feasibility study for the development of underground gas storage system in Pakistan, a technical assistance agreement was executed between the Government and ADB on the 26thJuly 2019.

ADB undertook competitive bidding process for the selection of Consultant to carry out the updated feasibility study. ADB has awarded the contract to M/s Ramboll Denmark, a leading international consultancy firm, with its associated partners DEEP.KBB GmbH, Germany and Élan Partners (Pvt.) Ltd., Pakistan to provide technical assistance for the subject task.

The Consultant has started work on updating the feasibility study. Various meetings have been held in this regard, contents of the study have been agreed and Consultant has given timeline to complete the assignment by May 2020.

e. Keamari Korangi Link Pipeline (KKLP-2)

Currently there are two seaports at Karachi, namely Port Qasim and Keamari which cater to the import of crude oil as well as refined petroleum products including Motor Gasoline (PMG) and Diesel (HSD). Keamari Port operated by Karachi Port Trust (KPT) has three (3) Oil Piers which have a combined capacity to handle approximately 24 Million MT/annum of cargo. The imported petroleum products handling facility at Port Qasim is owned and operated by FOTCO and has a capacity to handle 9 Million MT/annum of cargo.

Furthermore, the initiation point of White Oil Terminal Station (WOTS-1) of PAPCO's White Oil Pipeline (WOP) is also located at Port Qasim. This pipeline is being upgraded to transport PMG in addition to HSD to consumption centers located upcountry.

Considering the above scenario, it is strategically important that Keamari Port be linked to Port Qasim for transport of White Oil Products in order to ensure imports at Keamari Port have access to WOP system and in case one port is down the other can provide backup while using storages connected to either of the ports.

Accordingly, Pakistan State Oil Company Limited (PSO) is pursuing this strategic Project of linking Keamari Port with Port Qasim for transport of Motor Gasoline and Diesel Oil. This will significantly optimize the utilization of KPT's existing import infrastructure by linking Keamari Port with White Oil Pipeline (WOP). The project will also reduce traffic congestion and tailpipe emissions in Karachi City by decreasing tank trucks movement. Moreover, the project will ensure safe and cheaper transport of highly volatile petroleum products.

In this regard PSO plans to construct and connect Keamari to Korangi Link Pipeline (KKLP-2) as Korangi is already connected to WOP at Port Qasim through PAPCO's Korangi to Port Qasim Link Pipeline (KPLP).

Project Description

- The project is of strategic importance as it connects the two main commercial seaports of Pakistan.
- The Project includes construction of a 24-inch diameter multi product pipeline to connect storage facilities at Keamari Port with PAPCO's KPLP at PARCO's Pumping Station (PS-1) at Korangi.
- PARCO Korangi Pumping Station (PS-1) is already connected to Port Qasim through a 26-inch diameter transfer line to Port Qasim WOTS-1. This line is owned and operated by PAPCO.
- The Project will enhance flexibility of import operations and will reduce congestion at FOTCO jetty whilst optimising the use of Keamari Port.
- The project will also reduce Tank Trucks Movement through busy Karachi city districts.

Techno-Commercial Feasibility Study

- Route Reconnaissance Survey has been completed. Following two routes were studied:-
- Based on approval of Defence Housing Society, Karachi the route passing through Khayaban–e-Ittehad was finalized.

- Technical detailing and Process Flow Diagrams for the projects along with hydraulic studies have been completed and pipeline size, pumping and power requirements have been determined. Based on technical feasibility study the CAPEX and OPEX needs also have been determined.
- Financial model for the project has been developed based on industry white oil demand projections, port configurations and tariff models. Currently Front-End Engineering Design (FEED) of the project is underway based on which financial feasibility will be finalized.

Stakeholder Correspondence

Defence Housing Authority (DHA)

- Route has been finalized for laying of Pipeline within DHA area.
- Hazard Identification (HAZID) report based on current engineering level of the project has been submitted to DHA.
- Environmental Impact Assessment (EIA) study of the project has been completed and submitted to Sindh Environmental Protection Agency (SEPA). Subsequently, Public Hearing and Expert Committee meetings have also been conducted by SEPA and the No Objection Certificate is expected shortly.
- Consent of other stake holders have also been attained as described below.

Ministry of Defence (MoD): Conditional Route approval received from MOD subject to fulfilment of DHA requirements.

Karachi Port Trust: Route approval for Feasibility & EIA study received.

Karachi Development Authority: Route approval received, however, lease agreement and rehabilitation charges to be agreed.

Utility Companies: Route approvals have been received from the following utility companies for the Project: -

- K Electric
- Sui Southern Gas Company
- PTCL
- Karachi Water & Sewerage Board

Cantonment Board Clifton: Surveys have been completed and budgetary quotation for road rehabilitation charges has been submitted by CBC. NOC by CBC will be issued once payment against charges is made.

Way Forward

- Techno-commercial feasibility to be completed based on FEED.
- Right of Way approvals to be obtained from KMC and DC Korangi.
- Execution of Right of Way Agreements with land owning Authorities.
- OGRA license and tariff approval to be obtained for the Project.

CONCLUSIONS

CONCLUSIONS

This Development Plan provides comprehensive data-based information on Pakistan's energy profile, forecasts and the various energy projects which would help balance the demand with supply over the long-term. The document is intended to guide the Oil and Gas Working Group of the Energy Working Group of the China-Pakistan Economic Corridor, in finalizing the plans to develop the oil and gas industry of Pakistan through the participation of all parties, for the country's energy security. The Government of Pakistan would play its due role to:

Enable appropriate oil and gas projects investment recovery and foreign exchange protection policies and will strengthen coordination between Governments at all levels to ensure policy implementation and attract foreign investment;

Promote foreign investment with or without joint ventures with Pakistani public sector companies or private entities;

Promote the development of oil and gas resources and facilitate foreign oil and gas companies through friendly policies to invest in the sector. Further, Government would utilize good relations with investing countries to execute contracts on G2G basis for the exploitation of oil and gas resources;

Pursue the development of oil and gas sector infrastructure including oil and gas pipelines, new refineries, upgrading of existing refineries, above ground strategic oil storages, construction of additional LNG terminals, and facilitate Thar coal to liquid project;

Encourage E&P activities by offering Blocks through competitive bidding or awarding them through direct negotiations on G2G basis to exploit the huge potential in unexplored onshore and offshore basins and unconventional resources.

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