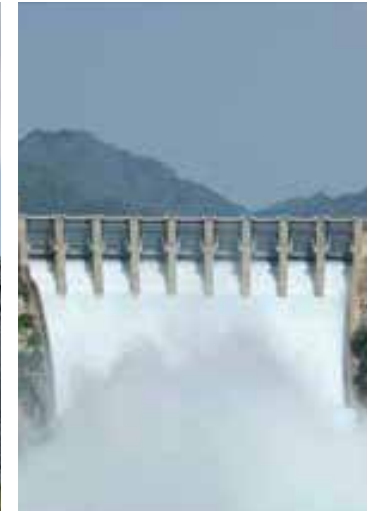


OICCI Energy Reforms 2023



Overseas
Investors
Chamber of
Commerce &
Industry



CURRENT
CHALLENGES,
OPPORTUNITIES
AND POLICY
RECOMMENDATION



Oldest Business Chamber in South Asia

Established in 1860 as Karachi Chamber of Commerce, the present name, Overseas Investors Chamber of Commerce and Industry (OICCI), was adopted in 1968. The Chamber serves as the national point of reference for foreign investors in Pakistan.

Vision

To be the premier body for promoting new and existing overseas investment in Pakistan by leveraging the world-class expertise of OICCI members for the benefit of the investors and the country.

Mission

- To assist in fostering a conducive, open, and equitable business environment in Pakistan
- To facilitate the transfer of best global practices to Pakistan
- To enhance the image of overseas investors in Pakistan and of the country abroad



OICCI ENERGY REFORMS RECOMMENDATIONS 2023

To streamline Pakistan's energy sector

About OICCI

The OICCI is the largest chamber of foreign investors in Pakistan. Established over 160 years ago, OICCI has played an important role in enhancing the investor environment. At present, the chamber has over 200 members who belong to 30 different countries and are engaged in 14 key sectors. OICCI members collectively contribute around one third of Pakistan's taxes and have invested over USD 22 billion in the last 10 years in Pakistan. OICCI members have been actively contributing to key initiatives of the Government of Pakistan and are keen to partner with the government initiatives to provide conducive environment for businesses. Twenty-four member companies are associates of Global Fortune 500 companies and 30% of our members are listed on the Pakistan Stock Exchange. Besides the Chamber's primary functions to promote and protect the existing foreign investment in the country and to attract new foreign investors, our activities contribute significantly to supporting commerce and industry across Pakistan.

Most international investors' delegations and trade delegations, who visit Pakistan, as well as diplomatic missions of foreign countries in Pakistan, call on OICCI to get an independent and balanced view of the business and investment climate in the country, which is highlighted by OICCI at domestic and international platforms.

OICCI is a research-based organization which releases new publications, policy statements and makes recommendations to the concerned authorities on matters of interest to investors. Significant activities in which the OICCI is engaged include, inter-alia, acting as catalyst to attract Foreign Direct Investment (FDI), enforcement of Intellectual Property Rights, recommending measures for ease of doing business for creating a level playing field for all investors in the areas of taxation, tariffs protection, intellectual property rights, international quality standards, physical safety and security of member companies' employees and assets and transfer of best global technology and practices in business to Pakistan by leveraging world class expertise of OICCI members for the benefit of all investors and the country.

The Chamber remains actively engaged with key stakeholders, on a one-to-one basis along with its member interactions to progressively narrow the gap between policies and their implementation, including making constructive recommendations to policymakers for improving the business and investment landscape in the country. Being the collective voice of over 200 large foreign investors in Pakistan, the chamber has a critical role to play in ensuring that policymakers are aware of, and sensitive to, the changing business environment with new challenges and opportunities, both, within the country and in the region. This interactive relationship is critical for facilitating retention, as well as expanding the operations of the existing foreign investors and in attracting significant new FDI, in competition with other regional countries.

In summary, OICCI assists in creating an investment friendly, forward looking, and equitable business environment in Pakistan. The chamber is regularly engaged with the relevant government authorities, including those in the provinces, and various regulatory bodies to formulate business-friendly policies which serve as a reference point for foreign investors.



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Foreword

On behalf of the Managing Committee and members of the Overseas Investors Chamber of Commerce and Industry (OICCI), we are pleased to present the ‘OICCI Energy Reforms 2023’ to streamline Pakistan’s energy sector for accelerated economic growth. These reform recommendations are a collective effort of the leading multinationals, members of OICCI, operating in the energy and power sectors of the country.

Overall, 33 OICCI members are engaged in the energy value chain including Upstream (Oil & Gas Exploration, Production, and Mining), Downstream (Refining and Distribution), Power (Coal and Thermal Generation, Transmission and Distribution), and Renewables. These multinationals bring in international experience and perspective on the energy value chain for the benefit of Pakistan.

OICCI members recognize that the 2022 Russia–Ukraine conflict had, and continues to have, a very serious economic impact on the economies and people around the world. The rising commodity prices, especially fuel, are reaching record levels. This was further amplified by severe economic crisis in Pakistan, underpinned by almost 80% devaluation of the PKR, inflation touching 35% and energy prices almost being doubled over an 18-month period. Political instability as well as increase in smuggled products from Iran and security situation in neighboring Afghanistan further worsened the impact on the end consumer. Pakistan, being largely dependent on imported energy, is facing several challenges including limited energy resources, dependency on imports to meet fuel requirement and expensive fuel mix for power generation. Moreover, growth in power generation and distribution has not kept pace with the growing economic activities over the years leading to a serious energy shortfall over the last few years. The insufficient availability and high energy cost has constrained the economic growth and employment opportunities. OICCI’s Energy subcommittee has attempted to address the growing energy challenge in this brief report, focusing on sector-wise recommendations, as was done in our prior submissions during 2021.

We invite you to go through these recommendations and also welcome comments, suggestions, and feedback, if any, from the readers of this report.

We would like to recognize the significant contributions of our experienced professionals, sector experts and in particular our core team of OICCI Energy Subcommittee members including Saad Ahmed, Hassan Ejaz, Asad Jamil Siddiqui, Aliya Idris, Aneeq Ahmed, Naila A. Malick and Mohammad Naeem Khan, together with Sakina Chakera of OICCI for their efforts and active support in formulating this set of Energy Reforms recommendation for the country.

Sincerely,

Amir Paracha
President OICCI

Waqar Irshad Siddiqui
Chairman OICCI Energy Committee

M. Abdul Aleem
CEO/Secretary General

Executive Summary

OICCI Energy Reforms Report 2023 gives an overview of the current challenges in the energy value chain, together with recommendations to improve performance, efficiency, control value leakage and reduce the cost of energy on a sustainable basis for the longer term. OICCI members believe that these proposed recommendations will add value for the policy makers in their endeavor for reforming the overall energy sector, bring it at par with the international best practices, besides ensuring meeting growing energy demand in the country, economically to remain internationally competitive for export and overall economic growth of the country.

This report has been structured in an actionable format, briefly highlighting the current constraints followed by recommendations on key policy changes that have been deliberated & drafted by experts in their respective fields. We are confident that our recommendations for reforms, if addressed by the government authorities, will bring much-needed growth in line with the potential of the country in the short to medium term.

The report has been divided into five main sections (1) Power, (2) Renewables, (3) Downstream, (4) LNG, and (5) Upstream sectors. Each section comprises a brief overview of the sector along with detailed recommendations. Summary of the high priority recommendations that are the harbinger of multiple other problems in the value chain are listed below:

POWER

The power sector of the country has faced tremendous challenges over time, which now pose a substantial threat to the overall health of the economy. With mounting circular debt and high electricity tariffs, structural reforms are required to address the crippling issues plaguing the sector. This section identifies four key areas: (i) demand planning, (ii) fuel mix, (iii) market deregulation, and (iv) the role of distribution companies (DISCOs) which are pivotal to solving the woes of the power sector.

The report details specific action items covering the four critical areas mentioned above. These actions include demand planning by subject matter experts to prevent periods of surplus or shortfall, the utilization of Thar coal and renewable energy to reduce reliance on imported fuel, market liberalization to pave the way for economical tariffs for industrial customers and restructuring or privatization of DISCOs to improve efficiency. All these measures aim to create a more competitive and resilient energy landscape.

RENEWABLES

While renewable energy has gained momentum in recent years, its growth is hindered by low participation from the private sector, attributed to delays in the competitive bidding process, the need for extensive transmission infrastructure - especially for wind and hydropower plants in remote areas and the intermittent nature of renewable energy projects, necessitating backup power generation capacity or battery storage capabilities.

Key recommendations put forth by the committee include encouraging the hybridization of existing wind farms with solar photovoltaic (PV) panels through a defined policy framework, identifying arid and solar-rich areas for the development of solar parks, improving the competitive bidding process to enhance private sector participation, accessing global funds such as the Green Climate Fund to reduce power costs and incentivizing indigenization in renewable energy equipment manufacturing. These measures aim to make the sector more attractive, bankable and economically viable.

DOWNSTREAM

Streamline downstream operations through holistic and structural reforms in the policy framework and governance structure. Update the outdated Downstream Policy of 1997 to align with current sector developments, ensuring investor protection and incentivizing investment through government legislation. The revised policy should comprehensively address key pain points such as price structure, supply chain management (including logistics infrastructure improvements and strategic stock building), import dependency, and stringent entry criteria for new players to promote fair competition and high standards. A strong regulatory framework is also required to address illegal flow of products which impacts revenue generation and availability of supplies. Timely approval of the Refining Policy 2021, currently under review by the Cabinet Committee on Energy (CCoE), is crucial to attract substantial investments for refinery upgrades and the establishment of a world-scale refinery/petrochemical complex, amounting to potential investments of 3-4 US\$ billion and 10-15 US\$ billion respectively.

Liquefied Natural Gas (LNG)

To ensure a stable gas supply and encourage foreign investment in the LNG sector, it is recommended to establish new private LNG terminals expeditiously. This would bring privately imported LNG molecules and foreign investment to Pakistan without government off-take guarantees. Additionally, the expansion of existing LNG terminals should be facilitated promptly to address upcoming winter gas shortages and support the development of a private RLNG market. To accelerate these processes, suggestions include signing the Terminal Coordination Agreement (TCA) by existing customers and operationalizing Third-Party Access (TPA) for excess capacity. A Price Negotiation Committee (PNC) should assess financial benefits to state-owned entities and resolve any pending issues. To streamline approvals, an LNG Task Force comprising regulatory stakeholders and industry representatives should be formed to simplify the review process, unify gas licensing rules, and eliminate redundancies in regulatory approvals. In the long run, consider Onshore LNG terminal as a key to long-term gas supply security for Pakistan.

Liquefied Petroleum Gas (LPG)

LPG's significance as an alternative domestic, commercial, and industrial fuel is growing due to the depletion of natural gas resources. However, its potential contribution to the energy landscape is hindered by regulatory conflicts and inadequate infrastructure, with over 400,000 MT of LPG imported annually against a storage capacity of only 13,000 MT.

UPSTREAM

To address the financial crisis faced by foreign investors in the upstream sector, timely payment of gas sale invoices is crucial. Currently, gas companies are defaulting on payments, resulting in outstanding receivables exceeding US\$600 million as of June 30, 2023. Insufficient payments from gas buyers are hindering operational and developmental expenditures, jeopardizing production and exploration activities. The collapse of the E&P sector would have long-term disastrous consequences for the economy, causing a decline in gas supply for cooking and disrupting citizens' daily lives.

Furthermore, to restore investor confidence in upstream activities, it is recommended to increase consumer gas prices to cover revenue shortfalls, allocate grants or subsidies to clear outstanding invoices of foreign investors, and advise the State Bank of Pakistan (SBP) to prioritize foreign exchange allocation for prompt payment release.

OICCI continues to offer the technical and professional services of its members to fully partner with the concerned government departments to make a structured and sustained effort to ensure that the country is put on the right path in improving the overall energy landscape to the benefit of the economy and people of Pakistan.

Highlights of the Key Energy Recommendations 2023

Section 1: Power – Market Reforms and Liberalization

1. Planning & Capacity Utilization

- a. Demand forecasting should be done by subject matter experts based on realistic assumptions and should be void of any political influence.
- b. Surplus capacity should be utilized as much as possible in the long term through incentives offered to substitute alternative uses of primary energy.
- c. Upgrading and enhancing the transmission infrastructure, both regional and national grids, for smart evacuation of existing renewable power generation and to accommodate any upcoming capacity additions.

2. Fuel Mix

- a. Mandate blending of Thar Coal to the maximum extent possible to reduce import bill.
- b. Favorable policy framework to drive investment in renewable energy, waste to energy and battery storage as a clean and cheap power source.

3. Market Liberalization

- a. Determine the Use of System Charges with an adequate wheeling charge which makes the bilateral market viable for new players to enter.

4. Distribution Companies

- a. Setup DISCOs for privatization by improving their overall health and performance. Steps include:
 - DISCO model to be revamped and should be allowed to operate as a wire business, earning tolling charges. This will pave the way for bilateral contracts as DISCOs currently stand to lose under the new competitive model.
 - Breakdown DISCOs based on geographical location and customer base to allow for operational efficiency and reduction of line losses.

Section 2: Downstream Sector

1. Forming a holistic policy framework & governance structure.

2. Review of Price Structure

- a. Price structure should be divided into two phases:
 - Phase 1 price structure of petroleum products should cover all incidental costs, forex adjustment
 - Phase 2 complete deregulation of MS & HSD front and back-end prices like Higher RON (95 & 97 RON)
- b. Move to previous policy of exchange rate
- c. Timely and adequate OMC & Dealer margin revisions
- d. Deregulation of IFEM

3. Create a favorable business environment
 - a. Effective Port Management.
 - b. Cohesive and robust implementation of rules to curb inflow and outflow of smuggled products.
 - c. Renewal of Licenses by Regulators.
 - d. Control Over Illegal Trade of Refined Products.
 - e. Hedging Mechanism for Petroleum Products Pricing and Forex Exposure.
 - f. One Window Solution.
 - g. Building of Strategic Stocks to Ensure Energy Security.

Section 3: Liquefied Natural Gas (LNG) Sector

1. (a) Establishment of new private LNG terminals on a fast-track basis.
(b) Expansion of the existing LNG terminals.
2. Constitute LNG Task Force to fast-track impending matters.
3. Expedite projects to create new pipeline capacity for the private sector.
4. Dependable pipeline capacity on a longer term to be guaranteed, for terminal developers and private LNG marketing entities.
5. Deregulation of the entire LNG value chain.
6. Onshore LNG Terminal as a key to long-term gas supply security for Pakistan.
7. Establish underground gas storages, virtual LNG pipelines and small-scale LNG.
8. Implementation of WACOG pricing mechanism to reduce the accumulation of gas circular debt.
9. Update the existing PQA master plan in consultation with existing Terminal operators within a given timeline.
10. Timely review the concession agreement with Port Authorities, to avoid business disruptions.

Section 4: Renewables Sector

1. Encourage hybridization of existing wind farms with solar PV panels through a policy framework.
2. Landmark arid and solar resource rich areas for development of solar parks.
3. Restart the competitive bidding process after incorporating comments from stakeholders to increase participation.
4. Promote the development of decentralized power markets in line with National Electricity Policy 2021 & CCoE approved principles, by allowing private players to enter into bilateral PPAs.
5. Leverage global pool of funds such as Green Climate Fund (GCF) for investment in RE.
6. Enhance the regional/national grid to facilitate evacuation of existing renewable power generation and to accommodate upcoming capacity additions.
7. Promote indigenization of locally manufactured RE equipment by introducing fiscal incentives to attract local and foreign investment.

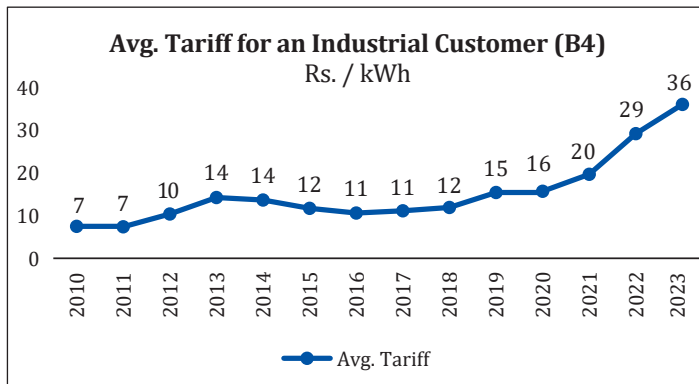
Section 5: Upstream Sector

1. Timely payment of gas sale invoices of foreign investors.
2. Encourage unconventional hydrocarbon resource exploration & development.
3. Maintain sanctity of contracts and other regulatory challenges.
4. Optimize recovery from ageing, maturing and marginal fields.
5. Institutional Capacity Building.

SECTION 1: Power – Market Reforms and Liberalization

Overview

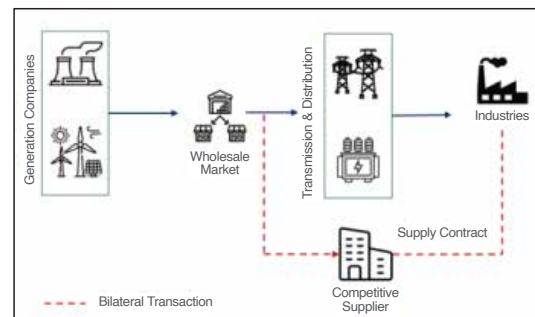
The power market of Pakistan has operated as a single-buyer model through the Central Power Purchasing Authority Guarantee Limited (CPPA-G), with the government being directly involved in the affairs of the power sector. This lengthy period of state ownership, without competition, profit motivation or cohesive planning to improve performance and develop a healthy power mix has led the sector on crutches. As a result, the country's power tariff is significantly higher than its peers which has impacted the regional competitiveness, translating in lower exports.



Country	Industrial Tariff 2022 (\$c/kWh)	GDP/Capita Growth (2022)
Indonesia	7.3	3.6%
Egypt	9.9	2.3%
Ethiopia	7.4	5.8%
Bangladesh	8.9	4.7%
Pakistan	16.5	1.7%

The NEPRA (Amendment) Act, 2018 laid the foundation for the development of a competitive electric power market in the country reducing the regulatory oversight of the sector. Since the amendment, fundamental structural changes have been introduced, which will pave the way for the creation of a functioning wholesale and retail market. This competitive model, termed as the Competitive Trading Bilateral Contract Market (CTBCM) framework has been approved by NEPRA (the 'Authority') and it had directed its licensees on 31 May 2022 to start the market on six-month trial run. Under CTBCM, multiple suppliers will be able to sell power directly to Bulk Power Consumers (over 1 MW) through bilateral contracts. However, the report of the six-month trial is yet to be published which will provide insights into marginal pricing (a key component of the CTBCM). Additionally, Use of System Charges which will determine the viability of bilateral contracts is yet to be announced, although multiple hearings have taken place.

NEPRA has formulated several regulations for the successful implementation of CTBCM, which aims to separate the supply of power from the ambit of distribution and lay the foundation of retail market eventually transitioning towards wholesale trade of electricity. Distribution Licenses of all DISCOs are in the process of being renewed and it is clear that exclusivity is no more available to DISCOs based on the decisions recently announced by NEPRA.



To ensure that all future generation projects are undertaken after careful study of projected demand, NEPRA approved the 2022-31 Indicative Generation Capacity Expansion Plan (IGCEP) in February 2023. NTDC has also submitted the 1st ever Transmission System Expansion Plan (TSEP) to NEPRA for approval. TSEP is divided in two phases - the 1st phase covering the first 05 years up to 2026 and the 2nd phase covering the next 05 years until 2031. Going forward NTDC will review the IGCEP and TSEP on a yearly basis so that both documents shall be fully integrated. Provinces are also eligible to develop their own transmission system for transmission of power within the province. Sindh emerged as the first province in Pakistan to establish its own first ever Provincial Grid Company and a license has been awarded to the Sindh Transmission & Dispatch Company (STDC) to act as Provincial Grid Company for Sindh in 2019. The Khyber Pakhtunkhwa Transmission and Grid System Company Limited has also been granted transmission license by NEPRA in 2021 to act as the Provincial Grid Company. Additionally, PESCO has been bifurcated into 2 distribution companies with the new entity emerging as the Hazara Electric Supply Company (HAZECO) to increase operational efficiency and reduce line losses for PESCO.

All of these fundamental changes, coupled with the increased interest of consumers in net-metering and wheeling of electric power, are going to lead towards a competitive environment as an unavoidable reality which the public sector entities, especially the DISCOs must realize. Any attempt to further protect the monopolistic and oligopolistic may not only hurt the power sector but also the overall economic growth of the country.

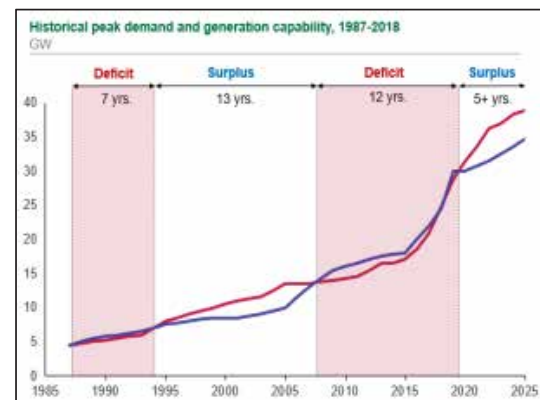
Key Challenges

For years, the matter of balancing Pakistan's supply against the demand for electricity has remained a largely unresolved matter. The power sector of Pakistan has been in focus for more than two decades now; yet the problems in the sector have increased to a point where without major reforms it has the possibility of bringing the whole economy down. Currently, Pakistan's power market excluding Karachi is riddled with non-payments and cash flow issues, high losses, long-term generation contracts backed by government sovereign guarantees, skyrocketing circular debt and excess generation. A deep dive into the issues indicate the following:

1. Lack of proper demand planning has led to alternating periods of power deficit and surplus

Major reasons include:

- No Integrated Energy Plan prior to IGCEP in 2022.
- Power projects developed in silos by multiple federal and provincial stakeholders. Currently, the IGCEP and NEPRA allow for provincial projects to not be part of the IGCEP if they are not connected to the grid. This would result in overestimating demand as this demand would not be reflected in the IGCEP.
- While net metering and solar distributed generation projects have been included in the IGCEP, suppressed demand from industrial customers owing to the nonexistence of the bilateral market has not been accounted for.

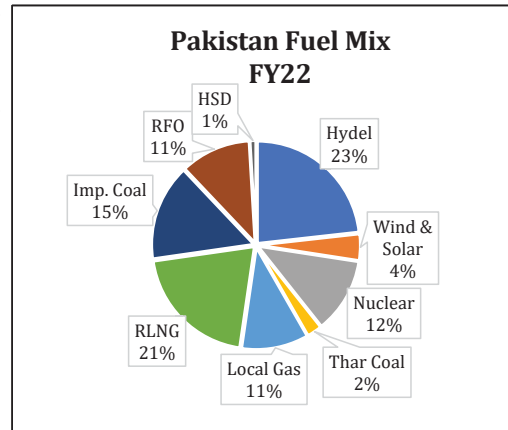


As a consequence, by 2025, there will be ~4GW of surplus capacity. This will increase fixed power costs, i.e., costs incurred regardless of production of electricity.

2. Sub-optimal fuel mix resulting in high reliance on imported fuel

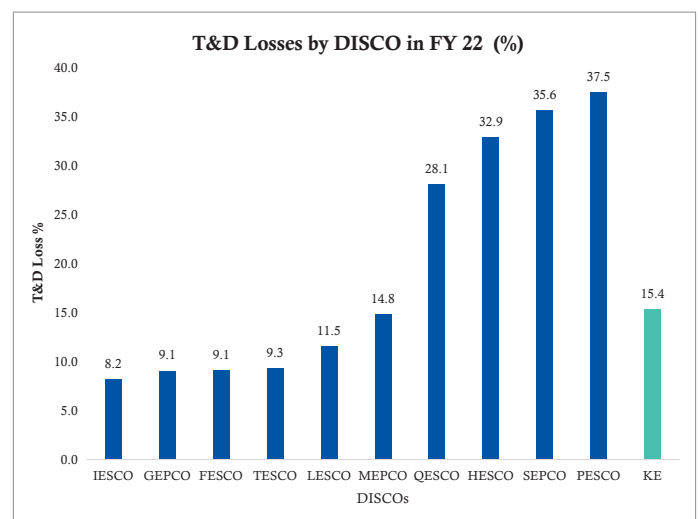
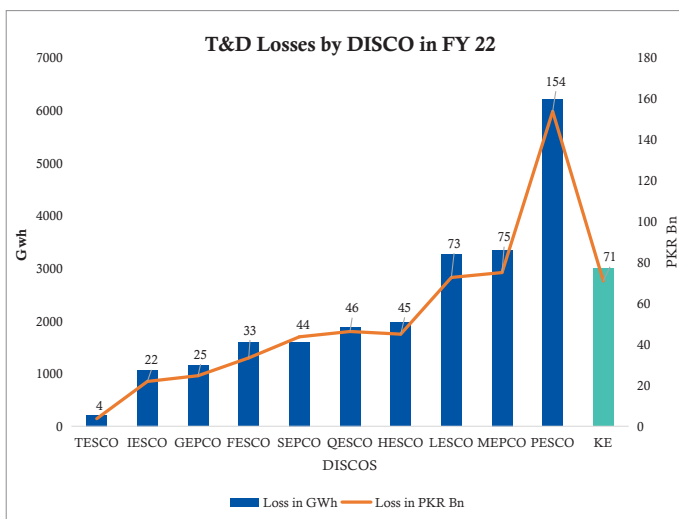
Pakistan heavily relies on imported fuel for power generation which constitutes around 50% in total energy generation. This is because in the past, Pakistan has favored development of imported fuel projects over domestic fuel projects. This has exposed the economy to forex outflow. This was further aggravated with the commodity super-cycle where prices had skyrocketed, hurting both consumers and the GoP.

Pakistan imported around USD 4 Bn worth of imported fuels to generate electricity. This accounts for ~15% of the country's energy import bill in FY22. As a result, electricity prices in Pakistan are the highest compared to benchmark countries, forcing domestic consumers to shift to solar power solutions.



3. Poor performance of DISCOs with high T&D losses and low recoveries

DISCOs lose substantially more power than their tariffs allow, which leads to losses for the government. According to NEPRA State of Industry Report, T&D losses amounted to Rs. 520 Bn, out of which allowed losses amount to Rs. 363 Bn and incremental losses (over and above allowed losses) amount to Rs. 157 Bn, this excludes K-Electric, which has a different tariff structure. Additionally, DISCOs lost Rs. 165 Bn in lower recoveries. It is estimated that DISCOs inefficiencies will contribute Rs. ~1.5 Tn to circular debt by 2025.



Key Recommendations

Based on current challenges the OICCI committee on Energy recommends the following key recommendations:

1. Planning & Capacity Utilization

- a. Introduce demand creation measures in line with National Electricity Policy 2021 & Cabinet Committee on Energy (CCoE) approved principles by transitioning from single buyer to multi-buyer model - i.e., energy sale via B2B mode through wheeling regime.
- b. Demand forecasting should be done by subject matter experts based on realistic assumptions and should be void of any political influence.
- c. Surplus capacity should be utilized as much as possible in the long term through incentives offered to substitute alternative uses of primary energy.
- d. Upgrade transmission infrastructure (regional and national grids) to align power evacuation with the merit order list, minimizing reliance on out-of-merit-order plants due to transmission constraints.
- e. Three country blackouts happened in the last 02 years thus, the NTDC should engage international consultants through their procurement process for the RCA & a mitigation action should be considered for sustainable transmission network to avoid such cascaded tripping.

2. Fuel Mix

- a. Mandate blending of Thar Coal to the maximum extent possible in existing imported coal IPPs in Phase I and eventually modify the plants to rely entirely on Thar Coal to reduce import bill.
- b. To reduce reliance on imported fuel and gain energy security, promote indigenization and increase hydel footprint along with investment in baseload projects through existing coal mines and additional mine exploration projects.
- c. Introduce policies, procedures, and strategies for inclusion of Hydrogen, Battery Storage, Pumped Storage and Waste to Energy along with Wind and Solar PV projects for sustainable transition towards wholesale market. Leverage global pool of funds available for investment in RE such as Green Climate Fund (GCF).

3. Market Liberalization

- a. Swift determination of an adequate Use of System Charges (UoSC) with a mechanism in place to gradually reduce wheeling charges over time. The stranded asset cost should be kept minimal to create a favorable case for CTBCM.

4. Distribution of Companies

- a. Setup DISCOs for privatization by revamping the business model and making them attractive for the private sector.
 - DISCO model to be revamped and should be allowed to operate as a wire business, earning tolling charges. This will pave the way for bilateral contracts as DISCOs currently stand to lose under the new competitive model.
 - Breakdown DISCOs based on geographical location and customer base to allow for operational efficiency and reduction of line losses.

SECTION 2: Downstream – Pakistan Oil Market

Overview

Pakistan's Oil sector is a major component of Pakistan's energy mix meeting ~80% of energy needs, therefore, holds a strategic importance in the economy of the country.

Domestic Oil market is segmented into Upstream (Exploration & Production), Midstream (Transportation of oil from production sites to refineries), and Downstream (Refineries and Oil Marketing Companies) sector.

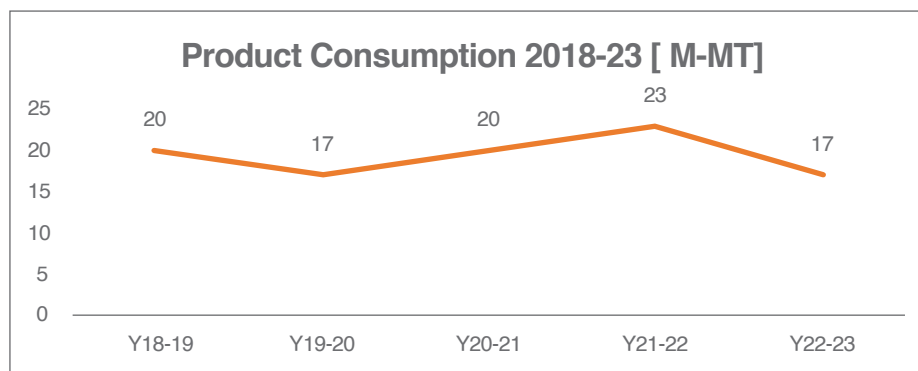
Designed refining capacity during FY2021-22 stood at ~20 Mn MT, while the total production for FY2021 – 2022 was recorded at ~11.6 Mn MT. The marginal increase of 0.3% highlighted the need for approval of a draft refining policy which would have enabled refineries to upgrade and enhance capacity.

The downstream oil sector includes 5 Oil Refining players and 68 Oil Marketing players (Permanent & Provisional licensed OMCs – 35 are provisional) approved and licensed by OGRA to function as OMCs in the Country.

	2020-21		2021-22	
Production (E+NE)	11,633,064	53%	11,671,773	48%
Finished Product Import	10,117,436	47%	12,890,365	52%
Total	21,750,500	100%	24,562,138	100%

Y-o-Y, dependence on imported molecules continues to increase, with local refineries having little incentive to enhance their share. Post implementation of the new refining policy, it is expected local production of energy and non-energy products will witness an upward trend.

Historical consumption of petroleum products over the past five years is shown below:



Pakistan Oil Report 2021 – 2022

Over the past five years, product consumption has gone down on account of economic downturn, increase in influx of smuggled product, political instability and natural calamities. In FY 2021 – 2022, the country's retail network grew to 9,813, registering an increase of 2% vs. LY. Total CNG sites stood at 878, with 177 COCO sites and 9 sites offering EV facilities.

Retail Site Network share spread across Punjab was recorded at ~63%, followed by Sindh and KPK having 21% and 9%, respectively. Karachi remained the city with the highest density of Retail Sites, around 6% of the share of total Retail Outlets.

Going forward, as per industry estimates, consumption is expected to hit 22 Mn MT by 2027 – 2028. Critical factors influencing this will be political and economic stability, ease of doing business, industrial activity and mobility trends.

Key Challenge

1. Outdated Policy Framework

Currently, the Downstream sector is facing a range of issues including but not limited to an outdated policy framework that does not cover key issues relevant to the ongoing developments in the sector, financial losses due to the current price structure and heavy regulations of the operational issues prevailing in the downstream business environment.

2. Shifting POL/HSD Pricing Mechanism & Averaging Exchange Rate to Fortnightly Basis

The pricing structure of POL products Motor Gasoline (MG) and High-Speed Diesel (HSD) is a combination of six different price components [Ex Refinery, Petroleum Levy & Sales Tax, In-Land Freight Equalization Margin (IFEM), Distribution Margin (OMCs) and Dealer Margin].

While OMC Margins and Dealer Margin are fixed (per Liter), the Petroleum Levy, Sales Tax and IFEM are variable components, the former two depending on the Government discretion, and the latter computed through a freight pool mechanism.

The start-up point for pricing mechanism is the 'Ex-Refinery Price' which is determined by the Regulator and was earlier determined based on PSO's weighted average costs of POL products in the preceding month and 30 days international prices published in the Platt's Oilgram.

However, applicable from 1st Sep'20 onwards, the Government of Pakistan shifted to the pricing mechanism from monthly basis to fortnightly basis and changed the price benchmark from PSO's oil imports to Platt's Index plus PSO's average premium, exchange rate and incidental costs.

Similarly, the current practice of averaging the exchange fortnightly is a challenge as it is not sustainable.

3. Manipulation of Freight Pool Mechanism

The In-land Freight Equalization Margin (IFEM) is an equally important element of the pricing structure, which allows petroleum prices to remain at par across the country. The objective of IFEM is to equalize fuel prices across the country. However, over the years the industry has witnessed the manipulation or misuse of freight pool mechanism through below:

- Compromising on fuel quality by introducing low quality Iranian smuggled product in product distribution.
- Passing on additional discounts to the Retailers over and above regulated margins due to low-cost smuggled product availability.
- Dumping and extra illegal deliveries made to other OMCs stations and/or illegal storages/stations.

4. Hurdles in Ease of Doing Business

- a. Port Constraints (Insufficient unloading capacity, long waiting time, unfair unloading management),
- b. Outdated explosive rules and non-aligned rules / standards between OGRA and Explosives and insufficient enforcement of existing rules and regulations
- c. Inadequate control over illegal trade of refined products,

This issue, by the Retailers has been one of the problems of the industry, which is also a violation of the Petroleum Policy. This has a very negative impact on the profitability of OMCs who conduct business ethically and in line with policy directives.

Illegal outlets not only impact Government's revenue but also lead to illegal flow of product, creating disparity between PL (Petroleum Levy) for direct and indirect sales. Such sites also create huge Health, Safety, Security & Environment (HSSE) exposure as lack of OMC oversight can result in tragic outcomes to public life and property.

Moreover, multiple approvals from various government bodies and agencies are required for new infrastructure development or expansion of existing structure/network.

These requisite approvals are sometimes inordinately delayed for a long time, which not only jeopardizes future corporate development plans, but also causes companies to fall short of regulatory compliances.

Lastly, every Oil Marketing Company is required to construct/develop a minimum storage of 20 days of its proposed sales as infrastructure prior to beginning sales in the country. Whereas no strategic storages have been developed in the country by the Government of Pakistan.

Key Recommendations

1. Forming a holistic policy framework & governance structure:

The downstream sector policy framework by the Ministry of Energy is required to protect and incentivize investment through government legislation.

- The Previous Downstream Policy, effective 1997, needs to be updated keeping in view the ongoing developments in this sector, including integrated energy planning for end-to-end energy security.
- The policy should exhaustively cover all issues including but not limited to price structure (regulation to deregulation), supply chain management focusing on logistics infrastructure, import dependency and building strategic stocks by government (increasing storage capacity).
- Quality of new players for streamlined supplies needs to be improved through a stringent entry criterion to promote fair competition and maintain high standards; maintaining consistency in policy decisions and eliminating barriers for growth due to extensive procedural issues which are critical to maintain investor's confidence.
- Implementation of Rule 35-B of Pakistan Oil Blending Rule 2016 to assess issuance of license to new OMCs.
- Early approval of Refining Policy 2021, under review by Cabinet Committee on Energy (CCoE), as the policy addresses the requirements to attract greenfield and brownfield investments in the Refining sector. The early finalization of policy will not only bring significant investment of US\$ 3-4 billion for existing five refineries (for upgradation) but will also attract an investment in a world scale refinery/petrochemical complex of US\$ 10-15 billion.

2. Review of price structure

a. The review of price structure should be divided into two phases:

- In Phase 1 price structure of petroleum products should cover all incidental costs, forex adjustment for the imports of the concerned period and assure sustainable and reasonable profitability for OMC's. Periodic/regular revisions should be made to the price structure to reflect actual costs for companies.
- In Phase 2 complete deregulation of MG & HSD front and back-end prices like Higher RON (95 & 97 RON) is suggested.
- To ensure seamless implementation, a disconnect between Provincial and Federal tax regimes should be streamlined. This will translate into reducing financial exposure for the OMCs that often results in supply chain disruptions. It will be prudent to align the regulator prior to any change in the pricing formula.
- Loss of government revenues owing to the channel conflict (direct VS indirect sales) needs to be addressed.



b. Move to previous policy of exchange rate:

Foreign exchange exposure is created owing to the consideration of only the actual payment rate of PSO and not all other importer OMCs in the product pricing. As a first step, immediately move to the previous policy of using the exchange rate prevalent one day earlier to the OGRA price announcement.

c. Timely and adequate OMC & Dealer margin revisions

- For diesel & gasoline 92RON, revision of margins should be done, effectively on July 1st of every year, based on Consumer Price Index (CPI), as per the decision taken by Economic Coordination Committee (ECC) in May 2016.
- Annual margin revisions should be enhanced in line with inflation impacting the oil sector.
- For OMC Margins, all cost including but not limited to demurrage cost, operating cost, 20-days inventory, impact of White Oil Pipeline operations (WOP) e.g line fill stocks / batch movements, real time stock monitoring through digitization and other necessary infrastructure development needs to be factored in. This is further impacted by the increase in working capital for OMCs on account of inventory in WOP.
- Develop a robust system/SOP for timely revisions in margins to avoid strike threats as well as oil industry cash flow issues. In case of any delay in revision of margin, an adjustment should be immediately incorporated upon revision to account for the delay.

d. Deregulation of IFEM

In the interest of providing a level playing field and fair price competition, it is recommended that:

- IFEM be rationalized to the pipeline fed locations only to make the scheme transparent, easy to manage & auditable by the regulators.

The current number of locations coupled with the number of OMC's has made the IFEM audit not possible. This should be a huge area of concern for the regulators. Thus, a phase wise approach, such as, one below will help the regulators maintain stronger oversight and transparency:

Phase 1 – On-time yearly IFEM audits to be conducted to identify malpractices.

Phase 2 – Gradually deregulate IFEM from pricing structure. It would eventually help in addressing the malpractices related to tax refunds, sale of fake products and dumping.

3. Creating a favorable business environment

To create a favorable business environment for existing players and to encourage investors to invest in Downstream sector, policy guidelines and structural reforms are required to address key issues of downstream sector such as:

a. Effective Port Management

Short Term:

- Dredging of the channel at PQA, including an alternate route for LNG vessels via Chara creek, to enable freeing up of time for discharge/ maneuvering of vessels at FOTCO.
- Lay dedicated line for Motor Gasoline (MG) at FOTCO & shift export of condensate to KPT port with dedicated pipeline – like Naphtha exports.
- Optimize/ extend the usage of Single Point Mooring (SPM) at Cnergyico Pk (Formerly Byco refinery) - Hub with the provision of special tugs to ensure safe discharge all year round for all importers.
- Facilitate Pipeline connectivity of Cnergyico Pk (Formerly Byco refinery) - Hub with PAPCO terminal at FOTCO. Already existing Asian Petroleum (APL) – Fuel Oil line (Hub to ZOT at PQ) can be converted for transporting MG and HSD.
- Establish & implement preventive maintenance.

Long Term:

- Trigger enabling environment for port-to-port connectivity (KPT-PQA) – which would not only ensure flexibility in handling petroleum products but would also remain a key contingency element for energy security in the country in case of any eventuality/ incident at one of the ports.
- Facilitate Pipeline connectivity of future Pakistan Coastal Refinery (PCR) with PAPCO terminal at FOTCO.
- Construct a new import jetty at PQA within a 2-year monitored timeline, this could be an opportunity for foreign investors.
- Construction of a new refinery, storage and oil piers at Hub to enhance long term security of supply.

b. Cohesive and robust implementation of the recently updated rules to curb illegal retail outlets, Inflow and outflow of smuggled product and supply disruptions.

c. Renewal of Licenses by Regulators: For the OMCs approved by Ministry of Petroleum, renewal of marketing license should be as per initial terms & conditions, including duration. Investments are based on long term economics and will be impacted if renewals are done over a shorter time frame (e.g 10 years). OGRA should be directed to extend the Marketing License of established OMCs for a 30 year period as per initial application.

d. Control Over Illegal Trade of Refined Products: OGRA should tighten its control on violating OMC's and Retailers through implementing penalties; License for OMCs involved in external upliftment repeatedly should be suspended/cancelled. Introduce DNA markers by OMCs to act as deterrence for illegal trade. Furthermore, the implementation of real time stock monitoring will enable both OMC and regulator to reconcile sales and supplies. Illegal stations/agencies to be closed.

e. Hedging Mechanism for Petroleum Products Pricing and Forex Exposure: In an age of volatile oil prices and FX rates, hedging has become a crucial part of business for most successful companies. The principal goal of hedging is to reduce the price and Forex risk. OMCs should therefore be allowed to hedge their Oil imports and Forex exposure.

f. One Window Solution: There should be a “one window solution” for all required regulatory approvals as a structural reform of the downstream sector.

g. Building of Strategic Stocks to Ensure Energy Security:

- Strategic stocks to be built by the government (through a company incorporated specifically for the purpose of building up stocks). OR OMCs should be compensated through price structure for investments made for Strategic Oil Storage Development and stocks held.
- A robust policy needs to be in place so that participating OMCs maintaining these stocks on behalf of the Government of Pakistan are not disadvantaged at any point in time i.e. policy implementation should remain independent of geo-political changes.

SECTION 3: Liquefied Natural Gas (LNG)

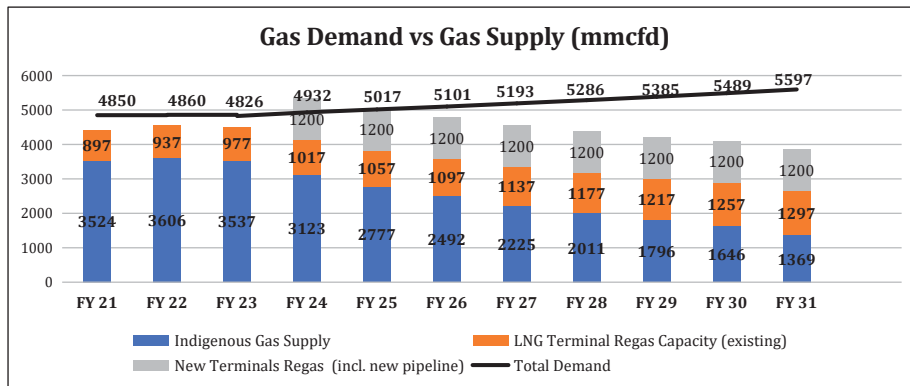
Overview

As per OGRA's State of Industry Report FY 2019-20, the current gas demand is 4850 mmcsfd. This demand is met through indigenous gas produced and imported LNG (Liquified Natural Gas). However, indigenous gas can contribute only 70% of demand, and the two existing LNG terminals are able to cater for supply availability of another 20%. Hence a shortfall of 10% exists even as of today.

The consequence of this shortfall is evident throughout the year and becomes even worse during winters on account of seasonality present in residential sector demand. As a result, diversion of gas from other sectors to residential sector take place, this effects CNG Sector¹ (closure of CNG stations for multiple days), industrial sector² and as well as impacts other sectors connected to the system as gas pressure falls in the entire grid.

It is pertinent to mention that seasonality of gas demand is significant in Pakistan, whereby the demand of gas rises to peak levels during winters, hence resulting in severe load shedding. In order to cater for both the normal demand and peak demand, significant additional LNG terminal capacity needs to be made available not only to plug the gap between annual demand and supply but to also have over and above the average demand to ensure year-round availability.

As forecasted by OGRA, gas demand will continue to grow reaching ~5500 mmcsfd by FY30 whereas the indigenous gas supply will continue to deplete reaching ~1600 mmcsfd in FY30. Indigenous gas supply will be able to meet only 30% of the demand. Existing terminals capacity of ~1200 mmcsfd (currently utilized at 65% capacity) will be insufficient to bridge this gap between indigenous supply and demand going forward.



Source: OGRA State of Industry Report FY 2022-2023

The two existing LNG terminals i.e Engro Elengy Terminal Limited (EETL) and Pakistan Gas Port Consortium terminal (PGPC) have played an integral role in meeting the gas demand and supply gap. The aggregate guaranteed regasification capacity is 1230 mmcsfd with EETL having guaranteed 630 mmcsfd and PGPC having guaranteed 600 mmcsfd capacity. Both terminals are highly utilized (2022 average: ~65%) compared to global average (~41%), as per IGU World LNG Report. This high utilization means there is need for additional regasification capacity even today, not only to meet demand but also to tap into the spot market at the right time and make cost of gas competitive.

Based on the current and impending gas challenges facing our country, the first step towards resolving the issue is to allow private players to build new LNG terminals and allow expansion of existing terminals under Third Party Access (TPA) regime.

1. <https://www.ssgc.com.pk/web/?p=5453>
 2. <https://www.dawn.com/news/1568267>

1st FSRU terminal on tolling – SOE as counterparty

2nd FSRU terminal on tolling – SOE as counterparty

Expansion of current Terminals under TPA regime

Integrated private LNG terminals

From timeline perspective, any new LNG terminals can come online no sooner than FY 27 (by the time which the supply demand gap will be ~2000 mmcf/d) given the timelines for FID and construction and availability of the "Pakistan Stream Gas Pipeline". Whereas existing terminal expansion can happen today subject to regulatory approvals and under Third Party Access framework as stipulated in the OGRA Ordinance, 2002 and LNG Policy, 2011. This was further supported through multiple ECC decisions and ratified by Cabinet decision and under the same decision, terminal operators have signed agreements with private parties for expanded capacity.

It is pertinent to highlight that in absence of expansion of existing terminals, the overall gas situation in the country will continue to become worse on account of increasing capacity shortfall.

Key Challenges

There are a number of current and impending gas challenges facing our country, such as:

1. **Depleting indigenous gas reserves:** Pakistan is currently faced with declining gas supply due to rapid depletion of indigenous gas reserves. No new major gas discovery has been made since early 2000s with major international Exploration & Production (E&P) companies exiting Pakistan over the last decade. The gas demand supply gap is being filled through importing LNG through two operational LNG terminals. Despite that, the gas crisis continues to worsen every year. Existing LNG terminals are not only few in number but are also unable to enhance their capacities due to absence of regulatory framework.

2. **Lack of pipeline capacity:** OICCI represents investors who are interested in establishing new LNG terminals and/or expanding capacity of existing terminals. However, neither of these two prospects can achieve fruition (or more specifically FID) in the absence of firm and dependable pipeline capacity.

Today, we are made to understand that there is no pipeline capacity available on a long-term, firm basis to be allocated to private LNG terminals/shippers.

3. **High UFG:** The gas sector is monopolized by SSGC and SNGPL with no competition. In FY 2022, the UFG (Unaccounted for Gas) losses for SSGC and SNGPL were 17% and 8%, respectively mainly due to thefts, leakages, non-recoveries, measurement errors etc. resulting in high inefficiencies in the overall supply chain.

4. **Gas Circular Debt:** Circular debt for gas sector is ballooning majorly due to diversion of RLNG to domestic sector and unavailability of legal framework for its recovery. Gas tariffs are ringfenced and cross subsidies are given to sectors. SNGPL diverts the imported LNG towards domestic consumers in the winter season that results in piling up of circular debt in gas sector.

5. **Outdated Port Infrastructure:** PQA Master plan has not been updated for more than two decades. This makes it difficult for new projects to be facilitated at PQA as any new projects site require an amendment to an obsolete master plan, which also requires an ECC approval.

6. **Concession agreement with Port Authorities:** Multiple BOT agreements of existing terminals are close to expiry and the lack of timely agreement on way forward is hampering investments and will risk future operations of the port, which will also impact the downstream industry which is catered through the port.

Key Recommendations:

- 1. (a) Establishment of new private LNG terminals on a fast-track basis** is integral for a stable gas supply to Pakistan in the future, as well as being conducive to growth of foreign investment in the LNG sector with no burden of off-take guarantee on the Government.

In 2019, in line with the decision by the Federal Cabinet and under PQA Guidelines 2019 for the Establishment of Floating/Offshore Liquefied Natural Gas Terminal on BOT Basis at Port Qasim, only two new terminal developers submitted Technical/Financial Proposal Fee to the federal government. The new government's facilitation in leading this process to fruition will result in successfully bringing privately imported LNG molecule along with foreign investment in the country for the first time in this sector.

- (b) Expansion of existing LNG terminals** should be facilitated on an immediate basis to bring additional capacity online especially in anticipation of upcoming winter months and impending gas shortages. This will further facilitate development of a private RLNG market (which does not exist today) and will facilitate new LNG terminals when they come online.

Specific suggestions to expedite this process include:

- i. The existing customers at LNG terminals i.e. SSGC at EETL and PLL at PGPC must sign off on the Terminal Coordination Agreement (TCA) to operationalize TPA for excess capacity with private parties (LNG marketing Companies) at the terminals. Furthermore, clear directives should be provided by the Ministry to SOEs (such as SSGC, SNGPL, PSO, PLL) for maintaining proper coordination with and supporting existing terminal operators and private parties to expedite the operationalization of TPA.
- ii. The Price Negotiation Committee (PNC) appointed by the Cabinet under the chairmanship of Planning Commission needs to assess the financial benefits to relevant SOEs and GoP for the Third-Party Access (TPA) implementation at existing terminals. The committee was supposed to revert within a week in Sept 2020 upon submission of proposal by the terminal operators. The ministry should decide the fate/role of Price Negotiation Committee under TPA i.e. Either amicable discussions with the terminal operators must be concluded and resolved at the earliest or roll back the PNC and allow terminal operators to negotiate commercial incentives with SOEs on bilateral basis.

- 2. Constitute LNG Task Force** to fast-track impending matters related to approvals, licenses and permits between different regulatory bodies, a committee constituting all regulatory and relevant stakeholders i.e. MOE, OGRA, PQA, Sui Companies and industry stakeholders comprising of existing/new terminal operators and marketing license holders, should be developed under a LNG Task Force (already enshrined under clause 7.4 of the LNG Policy 2011) to steward the LNG development projects.

The Task Force should set in motion a simplified review process with defined time frames by unifying the overall gas licensing rules and regime and removing redundancies in regulatory approval processes to expedite and streamline all approvals process required for the project.

- 3. Expedite all forms of projects that will create new pipeline capacity for the private sector** through either replacement of capacity that is created from declining gas production, or system augmentation/additional compression, or new transmission pipeline projects from South to North of the country (such as Pakistan Stream Gas Pipeline). A clear roadmap needs to be finalized and communicated to all aspiring investors/developers.

Additionally, under the oversight of the Regulator, a mechanism should be developed whereby Sui companies disclose exactly (i) how much capacity is being utilized and (ii) how much additional capacity can be made available in their existing system.

4. **Dependable pipeline capacity on a longer term to be guaranteed**, without which the terminal developers and private LNG marketing entities cannot sustain supply contracts with customers. Moreover, the government should devise a mechanism to manage flexibility of pipeline capacity, so that private players may also participate in usage of unutilized/excess transmission pipeline capacity during non-peak times in the year.

Due to variation of gas supply/demand in pipeline, there are several periods during the year where excess capacity is available. This can be used by private players if an advanced capacity utilization mechanism is developed.

5. **Deregulation of the entire LNG value chain** needs to be expedited and have absolute support of all end-to-end stakeholders within the value chain and government decision making authorities. In this regard, the following steps need to be allowed by the Government with the overarching understanding that Sui companies need to be unbundled in terms of gas transportation and gas marketing activities to avoid conflict of interest in pipeline capacity allocation:

- i. Price determination of privately imported LNG molecules should not be subjected to Government oversight/involvement.
- ii. International Private Shippers should be allowed to import LNG and given terminal and pipeline capacity through a fair, transparent, and competitive process.
- iii. High UFG remains one of the biggest challenges that restricts private shippers from using the pipeline network even if pipeline capacity is made available. Competitive tolling charges for the shippers by the transportation companies (Sui companies) should have an acceptable component of reduced UFG, which should be benchmarked with global UFG allowances to avoid passing on of the high inefficiencies of transporter's pipeline system on to the shipper.
- iv. Bilateral agreements between private entities for sale/purchase of RLNG should be encouraged without any hindrance from SOE's.
- v. Removal of excessive duties and taxes and introduction of various fiscal incentives to attract investments in the entire LNG value chain.
- vi. Privately-owned integrated LNG projects and excess capacity of existing LNG terminals which is not contracted by public sector entities should be exempted from TPA Rules. It is pertinent to note that competition between private LNG/ RLNG shippers will ensure that consumers – domestic and industrial alike – enjoy efficient and cheaper energy consumption.

6. **Onshore LNG Terminal** should be considered as a key to long-term gas supply security for Pakistan, given that due to the increasing gas demand of the country and volatile FSRU markets, the onshore terminal would serve as a strategic asset to ensure energy supply security for the country.

7. **Establish underground gas storages, virtual LNG pipelines and small-scale LNG** as globally they are gaining momentum due to their ability to provide insurance against unforeseen supply disruptions, distribute gas to off-grid areas, and initiate transition towards cleaner energy in various industries, respectively. To keep pace with the global vision of energy security and reduced carbon emissions, early attention to these areas is critical.

8. **Implementation of Weighted Average Cost of Gas (WACOG)** pricing mechanism to reduce the accumulation of gas circular debt and lay out proper mechanisms to collect RLNG receivables.

9. **PQA should update its existing Master Plan** in consultation with existing Terminal operators and update it within a given timeline. PQA should also expand night navigation for all vessels berthing at Port Qasim to reduce channel traffic issues by increasing the number of pilots and navigational aids, such as, lighting buoys, VTMS systems etc.

Additionally, Chan Waddo channel should also be opened to manage PQA vessels traffic load efficiently. Lastly, the port charges collected by PQA from LNG vessels are very high compared to regional ports. These port charges need to be rationalized based on an independent assessment that would benefit the end-consumers through a reduction in the overall LNG cost.

10. **Timely review of the concession Agreements:** PQA to work with incumbent operators to mutually extend/renew the BOT agreements (as and when necessary) to avoid business disruptions.

Liquefied petroleum gas (LPG)

LPG's share in the Energy mix is though very low currently, its importance as an alternate domestic, commercial and industrial fuel is critical and the LPG footprint is going to considerably increase in the future due to depleting Natural Gas supplies in the country. LPG's role as an alternate cleaner fuel is further supported by its versatility, ease of transport and interchangeability with natural gas and liquid fuels.

LPG's potential to contribute more towards the energy landscape of the country is, however, marred by the absence of level-playing field and conflicting regulatory rules promulgated by OGRA and the Department of Explosives. There are 250+ LPG marketing companies operating in the country, and it is imperative that investment is made in this sector to develop jetty and storages at ports, especially keeping in view the fact that around 400,000 MT LPG is imported per annum whereas the storage capacity is approximately 13,000 MT.

- **To harness the potential of LPG as a vital alternative energy source,** it is imperative for regulatory authorities to address inconsistencies and streamline regulations. Additionally, investments should be directed towards expanding storage capacity, particularly at ports, in order to accommodate the substantial annual LPG imports and ensure a stable supply for domestic, commercial and industrial consumers.

SECTION 4: Renewables

Overview

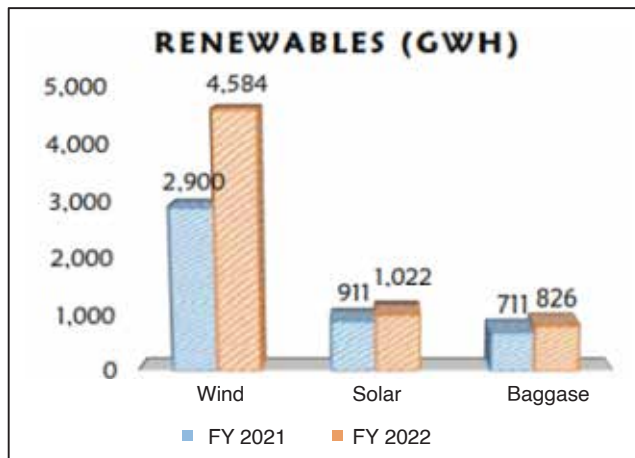
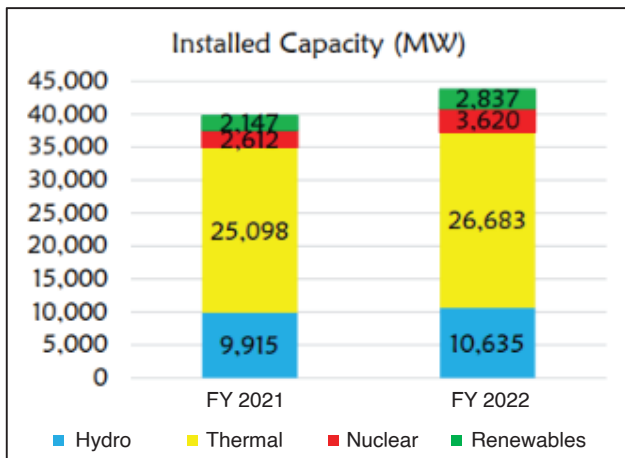
According to the World Bank study³, utilizing just 0.071% of the country's area for solar photovoltaic power generation would be sufficient to meet Pakistan's current electricity demand. Additionally, wind is also an abundant resource in the country as Pakistan has several well-known wind corridors with average wind speeds of 7.87 m/s in 10% of its windiest areas. The World Bank report indicates that a 30% Renewable Energy (RE) mix by 2030 (ARE Policy 2019 target) will make electricity cheaper, reduce carbon emissions & help Pakistan to save USD 5 Bn over the next 20 years. Moreover, the study further concludes that the required investment in transmission to accommodate an expansion in power generation capacity would be lower by USD 3.5 Bn if RE targets are met.

Such a target is also aligned with the global transition towards renewables, i.e., ~USD 3.5 Tn will be invested globally to increase installed renewable generation capacity by ~100% by 2030, reaching ~5,000 GW, with share of solar, and wind being ~40%, and ~25% respectively in RE⁴ capacity. Increasing power generation from RE is a key lever in achieving net zero carbon emissions by 2050; the aim is to limit temperature increase to 1.5°C as agreed in the Paris Climate Agreement. Solar and wind power generation installed capacity will see the most growth by 2030, increasing by ~230% and ~200% respectively from current levels.

The addition of RE projects has accelerated the power sector, bringing in the advantages of clean and indigenous resources. The rapid decline in prices, owing to improvement in technology, has made solar and wind power the cheapest source of energy.

Key Challenges

The contribution of renewable in the electricity generation has increased from 3.1% in FY21 to 4.2% in FY22. The addition of RE projects has accelerated the power sector, bringing in the advantages of clean and indigenous resources. The rapid decline in prices, owing to improvement in technology, has made solar and wind power the cheapest source of energy. However, despite several successful projects, the development process has remained slow with installed capacity of solar and wind energy in Pakistan at just around 3,000 MW as of June 2022. This represents just 6% of total installed capacity.



3. Variable Renewable Energy Integration and Planning Study, Pakistan Sustainable Energy Services, The World Bank, November 2020

4. World Energy Outlook 2020, IEA (International Energy Agency)

In essence, the inclusion of RE power plants, being intermittent in nature, is still a big challenge due to reasons like requirement of backup power generation capacity as well as development of transmission infrastructure due to remote locations of wind and hydropower plants. Thus, to increase RE penetration in Pakistan, following set of challenges need to be addressed:

1. Structural market reforms to make projects bankable.
2. Offer an economically viable benchmark tariff which allows for indexation.
3. Investment in transmission sector to accommodate intermittent sources of power.

The private sector is wary of investing in RE due to recent ROE negotiations on thermal IPPs, and the poor financial state of CPPA-G. Consequently, there is a need to enable bilateral PPAs between consumers and producers of power by enacting sector reforms. Similarly, Pakistan's transmission network is already struggling to accommodate the recent rapid expansion in generation capacity from CPEC projects⁵. Moreover, despite vehement rhetoric and debate, GoP has failed to enact DISCO reforms.

To make matters worse, the above challenges are leading to an adverse impact on consumers in the form of poor grid reliability and high cost of power. This is evident from the frequency and duration of power disruptions in Pakistan which are 10+ times above benchmarks set by the regulator; and power tariffs for industrial and residential customers, which are ~30% above regional peers⁶. Lack of investment in transmission and distribution causes planned and unplanned load shedding particularly in summer when power demand is the highest. Similarly, the high cost of power which is a function of fuel mix, excess capacity, and recovery of losses, prompts consumers to develop captive power solutions.

Key Recommendations

Based on current challenges, the OICCI committee on Energy presents the following key recommendations:

1. Encourage existing wind farms to hybridize with solar PV panels through a policy framework to increase overall capacity factor.
2. Landmark arid and solar resource rich areas for development of solar parks.
3. Restart the competitive bidding process after incorporating comments from stakeholders to increase participation (the 600 MW Muzaffargarh RFP did not yield any interest from private players).
4. Promote the development of decentralized power markets in line with National Electricity Policy 2021 & CCoE approved principles, by allowing private players to enter into bilateral PPAs.
5. Leverage the global pool of funds available for investment in RE such as Green Climate Fund (GCF) to lower the cost of power, modernize the national grid; and enact necessary structural reforms.
6. Enhance the regional/national grid to facilitate evacuation of existing renewable power generation and accommodate upcoming capacity additions, particularly in the energy corridors of Jhimpir (Sindh) and Chaghai (Balochistan). In particular, full utilization of Quaid-e-Azam Solar Park (Punjab) should be expedited to showcase the auctions methodology as defined under RE policy 2019.
7. Promote indigenization of locally manufactured RE equipment by introducing fiscal incentives to attract local and foreign investment (through JVs & SEZs) for the development of RE industry.

5. 10 GW additional capacity (hydro, coal, RLNG, and nuclear) is expected to come online between 2021 and 2025.

6. Bloomberg New Energy Finance

SECTION 5:UPSTREAM

Overview

Pakistan's upstream oil and gas production is predominantly sourced from two onshore areas, namely the Lower and Middle Indus basin and Potwar-Kohat Basin. Around 80% of the exploration wells have been drilled in the Lower and Middle Indus Basin, whereas 16% have been drilled in Potwar-Kohat Basin with only 4% in other basins, including Offshore Indus and Offshore Makran.

The country has large sedimentary area in which only 1102 exploratory and 1451 appraisal/ development wells have been drilled so far with an average drilling density of wells per 1000 Km². These wells have resulted in 393 successful discoveries (98 Oil, 295 gas/ condensate) giving a success ratio of 1:2.8, which is quite attractive.



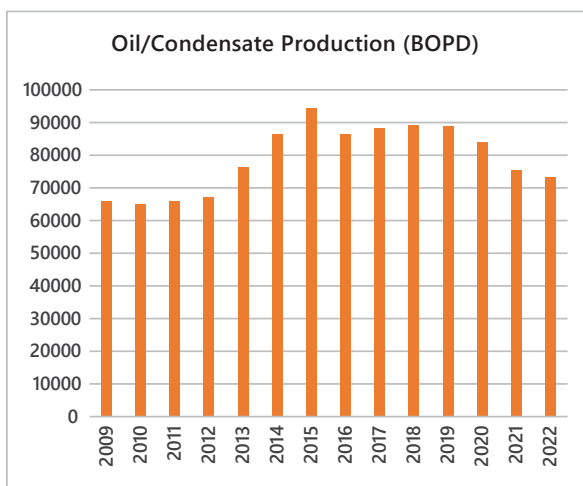
Source: PPIS

Indigenous Oil & Gas Production

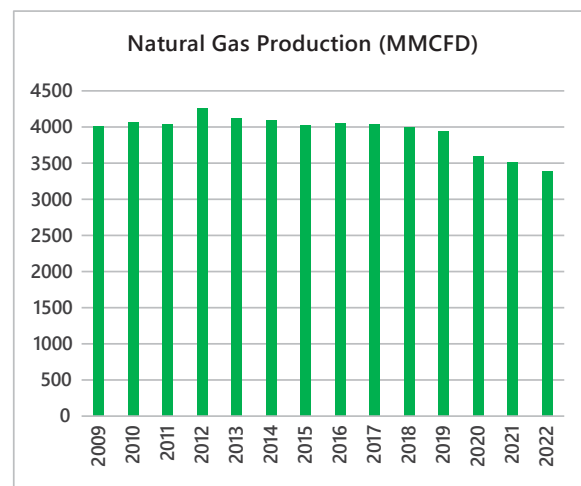
During FY 2022, the country's crude oil production was 73,436 BOPD. In the FY 2022, sixteen oil and gas discoveries were made. However, with few significant oil and gas discoveries, Pakistan still relies upon the mature fields that continue to decline in production. During FY 2022 the country's gas production was 3,390 MMCFD.

Oil & Gas Production Trend

Pakistan's oil and gas production has declined over the years due to the natural maturation of producing fields combined with a slower reserve replacement rate and decreased exploration and investment.



Source: PEO/PPIS



Source: PEO/PPIS

Major Oil and Gas Discoveries

Despite the increase in number of drilling activities in the country, large natural gas discoveries in terms of volume have been missing. A similar trend can be observed in crude oil discoveries where only one major discovery i.e. Nashpa, bigger than 50 MMBBL, has been discovered after 2000.

Regional Drilling Density

Lack of access infrastructure and security conditions and associated costs have constrained exploratory activity in KPK and Balochistan, keeping these potentially hydrocarbon rich areas underexplored. Balochistan's drilling density of only 0.22 is the lowest among all provinces. KPK ranks a little higher with drilling density of 0.42. Sindh is by far the most well explored province with drilling density of 5.23.

Province	Wells Drilled	Area (Sq. km.)	Drilling Density (wells per 1000 Sq. Km.)
Punjab	232	206,250	1.13
Sindh	733	140,914	5.23
Balochistan	79	347,190	0.22
KPK	43	101,741	0.42
Pakistan Onshore	1102	796,096	1.40

Source: PEY, PIP

Reserve to Production Ratio

	Natural Gas	Crude Oil/Condensate
Reserves (2022)	19,513 BCF	232.5 MMBBL
Production (2022)	3,390 MMCFD	73,436 BOPD
Reserve Life	16 Years	9 Years

Source: PPIS

Marginally Economic Fields

Fields are considered non-or marginally commercial due to their matured production profile or for having poor commercial economics. Resource potential of marginally economical or uneconomical fields has not been formally documented nor do incentives exist to exploit them. Marginal fields require secondary or tertiary recovery technologies for extracting up to 10% - 20% of gas and up to 15% - 25% oil. Use of these technologies requires additional capital expenditures for which no price incentive is in place and because of which about 25 – 30 such oil/condensate/gas fields in Sindh, Punjab and Balochistan would be forced to shut-down due to lack of incentive. Introduction of marginal fields policy with price and fiscal incentives would enable recovery of additional oil/gas from these fields.

Unconventional Resources

Unconventional resources are petroleum and gas reservoirs whose permeability/viscosity ratio requires use of advance technologies to alter either the rock permeability or the fluid viscosity in order to produce the hydrocarbons at commercial competitive rates. Unconventional hydrocarbons include tight gas/oil, shale gas/oil, coalbed methane and gas hydrates. Development of unconventional resources is at early stage in Pakistan. Cost of production from unconventional fields are extremely high as compared to normal gas fields as huge capital investment is required for drilling additional number of wells because of lower productivity, therefore additional financial incentives are required by E&P companies for the production and development of these unconventional resources.

Key Challenges

Apart from the above-mentioned challenges, the following also act as a hindrance to Pakistan' upstream oil and gas production.

1. Deteriorating financial position of gas companies

Gas produced by foreign investors is sold to government nominated state-controlled gas companies (SSGCL/SNGPL). Since last one-year foreign investors are facing unprecedented default by gas companies in payment of gas invoices. As of 30th June 2023, the outstanding Trade Receivables of foreign companies are over US\$ 600 million. Foreign companies operating in Pakistan are paid a fraction of cost of highly expensive imported LNG and substantial portion of the revenue are paid in the form of tax and is also re-invested in Pakistan for producing cheaper energy for the lifeline consumer.

Currently the payment position has gone so worse that the payment made by gas buyers are not even sufficient to cover payment of 18% sales tax and 12.5% royalty and advance income tax and nothing is available to fund operating, development and exploration expenditures. Under such circumstances, foreign investors are not able to run gas production operations and have no funds to carry out our planned exploration and development drilling activities. Currently twelve (12) months invoices of foreign investors are outstanding, and the receivable position is ballooning day by day. The financial crisis of the E&P sector is also evident from the fact that in the last Bid Round of June 2023, out of 18 exploration blocks offered for bid, the bids were received only for 3 blocks.

Collapse of Pakistan E&P sector would usher the country to a long term and irreparable disastrous consequences due to cessation/rapid decline of production which may lead to absolute collapse of economy and disruption of city life which rely on cheap gas for cooking of food. This crisis of meeting citizens' physiological needs is already evident from the rationing of supply of gas to the domestic consumers.

This financial position of gas companies has been deteriorating since 2018 as the increase in the consumers prices is not adequate to cover the gas buyers' revenue shortfalls. As per 2023-24 petition of SSGCL, the prices charged to the consumers are Rs 953/mmbtu whereas the OGRA prescribed prices (including past years arrears) are Rs. 2,994/mmbtu. Due to the massive difference in the cost of gas and the price charges to the consumers, the gas companies have virtually gone bankrupt. The payment position has been further complicated due to the fact that the SBP has not allocated foreign exchange for the release of US\$ denominated gas invoices.

2. Sanctity of Contracts & other Regulatory Challenges

When sanctity of contracts is not maintained it damages investor confidence with a negative impact on investment in the sector. Two key examples are Windfall Levy on Oil (WLO) and Indexed Rent issues.

- i. WLO Issue:** The E&P companies entered into supplemental agreements (SA) for adopting the 2012 Policy and such SA did not contain a provision for the payment of Windfall levy on oil in most concessions. The Government is now trying to impose WLO on the E&P companies which is a clear case of unilaterally trying to change an executed agreement. The matter is now in court.
- ii. Indexed Rent Issue:** Since 2011, DGPC has been demanding from E&P companies enhanced lease/licence area rentals since the date of grant of the lease/licence based on retrospective annual increases in the rental at the rate of inflation. In 2016, a number of E&P companies went to court and argued that indexation cannot be applied retrospectively to concessions/licenses granted previously and if applicable, can only be applied with prospective effect.

In the past, the Government has adopted coercive measures like granting a lower natural gas price, where the WLO issue is involved. Other examples of changes in fiscal rights enshrined in the PCAs include introduction of Super Tax and enhancement of customs duties.

Moreover, routine matters are being sent to the Cabinet for approval, which is causing major delays in putting new discoveries online at a time when the country is in desperate need of cheap energy.

3. Acute Shortage of Talent

The Government is the owner of the hydrocarbon resources of the Country, the role of the Government is key in exploration and efficient and optimal extraction of these resources. However, the DGPC office is currently facing an acute shortage of talent.

Due to the limited number of skilled workforces, the work is being managed by seconded employees of the state controlled corporate entities. Due to multiple reasons the Government is unable to attract experienced and talented human resources from the market.

Key Recommendations

Based on current challenges the OICCI committee on Energy recommends the following key recommendations:

1. Timely payment of gas sale invoices of foreign investors

To restore the investors' confidence, it is recommended to enhance consumers gas prices to cover the revenue shortfall of the gas companies on a timely basis, and to allocate grant/subsidy to gas companies for clearing overdue invoices of foreign investors and also advise the SBP to allocate forex for release of payments on a priority basis.

2. Encourage Unconventional Hydrocarbon Resource Exploration & Development.

Pakistan's Tight Gas resource potential is estimated to be at least 67 TCF based on estimates by three major companies. However, the overall potential should be well above 100 TCF. Whilst a Tight Gas policy exists, the definition of Tight Gas needs to be improved and the third-party certification process, which can currently take up to two years, needs to be simplified and the involvement of the regulator decreased. Elimination of government carry, and some further fiscal incentives will be required to stimulate E&P activity in this area.

The E&P industry has had multiple rounds of discussions with the Ministry of Energy (MoE) on the proposed amendments. Most of these have been landed with the MoE and we are currently awaiting final review and approval by the concerned authorities.

Shallow offshore and tight gas have lower risk and are capital intensive, and also have shorter gestation period as compared to Shale Gas development. Additional commercial incentive like 20-30% higher price for the first 500 MMscfd gas may be considered. Cap for pricing to be ~10% discount to imported LNG.

For shale gas, the first few projects should be defined as Pilot Projects with additional tax breaks with effective price (after deducting Government take) to be capped by imported LNG price.

3. Maintain Sanctity of Contract

To restore investor confidence in the sector it is recommended to either amend the rules such that the word 'Government' is replaced by 'DGPC/Regulator' or delegate the authority for approval of non-financial matters, such as, (EWT, DOC, FDP, License/Lease Extensions and Lease Grant etc.) from cabinet to the DGPC.

4. Optimize recovery from Ageing, Maturing and Marginal Fields

A number of initiatives have been shared by the industry over the years to optimize recovery from ageing, maturing and marginal fields. However, these have not been addressed.

2013 Rules envisage re-grant of a lease after 30 years for a further 5 years by paying an extra 15% of wellhead value to the government – this does not work as fields that have produced for 30 years are already depleted and often struggle to remain cashflow positive.

There is a need to set up a Task Force to look into the ageing fields policy proposals and other production enhancing opportunities. If production continues beyond 30 years, the lease should be extended without any increase of 15% as envisaged in the Rules.

5. Institutional Capacity Building

Governments around the world are facing challenges of optimizing production from the existing dwindling conventional oil and gas resources. Since oil and gas regulation is getting highly sophisticated for managing daunting technical challenges, the need for hiring the best human resources is vital for taking lead in reaping the benefits for economic growth of the country.

The Government needs to review its existing policy to attract highly competent staff with relevant experience for turning around the energy landscape of the country. We believe that investing a few million dollars in capacity building will lead to savings of billions of dollars by developing challenging hydrocarbon resources. For example, in the recent past, the UK has established a new “Oil & Gas Authority” and made it a limited liability company which has hired best talent which has started yielding remarkable improvement in regulation and leading the industry towards achieving excellence.

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Glossary

used in the Position Papers

ARE –	Alternative and Renewable Energy
BOPD –	Barrels of Oil Equivalent Per Day
BOT –	Build Operate Transfer
BPCs –	Business Planning and Control System
CCoE –	Cabinet Committee on Energy
COCO –	Company Owned Company Operated
CPI –	Consumer Price Index
CPPA-G –	Central Power Purchasing Agency
CTBCM –	Competitive Trading Bilateral Contract Market
DGPC –	Director General of Petroleum Concessions
DISCO –	Distribution Company
DOC –	Declaration of Commerciality
E&P –	Exploration and Production
EETL –	Engro Elengy Terminal Pakistan
EHT Network –	Extra High-Tension Network
EWT –	Extended Well Testing
FACTS –	Flexible AC Transmission Systems
FDP –	Field Development Plan
FID –	International Federation for Information and Documentation
FOTCO –	Fauji Oil Terminal & Distribution Company Limited
FSRU –	Floating Storage Regasification Unit
GCF –	Green Climate Fund
GENCO –	Generation Company
GHG –	Green House Gas Emissions
HAZECO –	Hazra Electric Supply Company
HSD –	High Speed Diesel

HSSE –	Health, Safety, Security and Environment
IESCO –	Islamabad Electric Supply Company
IFEM –	In-Land Freight Equalization Margin
IGCEP –	Indicative Generation Capacity Expansion Plan
IPPs –	Independent Power Producers
IRR –	Internal Rate of Return
LCOE –	Levelized Cost of Energy
MARPOL –	“Marine Pollution” International Convention for Prevention of Pollution from Ships
MG –	Motor Gasoline
MMT –	Million Metric Ton
MMTOE –	Million Tons of Oil Equivalent
MoE –	Ministry of Energy
MoP –	Ministry of Energy (Power Division)
MoPNR –	Ministry of Energy (Petroleum Division)
NDC –	Nationally Determined Contributions
NPCC –	National Power Control Centre
NTDC –	National Transmission and Distribution Company
O&M –	Operations and Maintenance
OEM –	Original Equipment Manufacturer
OGRA –	Oil and Gas Regulatory Authority
OMC –	Oil Marketing Company
PCR –	Pakistan Coastal Refinery
PGPC –	Pakistan Gas Port Consortium terminal
PNC –	Price Negotiation Committee
POL –	Petroleum, Oil and Lubricants
PPA –	Power Purchase Agreement

PPIB –	Private Power and Infrastructure Board
PPM –	Parts per Million
PQA –	Port Qasim Authority
PV –	Photovoltaic
RLNG –	Re-gasified Liquefied Natural Gas
ROE –	Return on Equity
RON –	Research Octane Number
SA –	Supplemental Agreements
SCADA –	Supervisory Control and Data Acquisition
SEPCO –	Sukkur Electric Power Company
SEZ –	Special Economic Zone
SOE –	State Owned Entity
SNGPL –	Sui Northern Gas Company Limited
SPM –	Single Point Mooring
SSGCL –	Sui Southern Gas Company Limited
STDC –	Sindh Transmission & Dispatch Company
TCA –	Terminal Coordination Agreement
TCEB –	Thar Coal and Energy Board
TPA –	Third-Party Access
UFG –	Unaccounted for Gas
VTMS –	Vessel Traffic Management System
WACOG –	Weighted Average Cost of Gas
WOP –	White Oil Pipeline Operations
WLO –	Windfall Levy on Oil



Overseas Investors Chamber of Commerce and Industry

Chamber of Commerce Building, Talpur Road,
Karachi-74000, Pakistan.

+92 21 32410814-15 | +92 21 32427315

info@oicci.org | www.oicci.org | @oicci_pakistan



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