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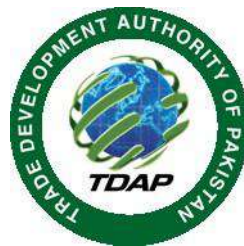
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Petroleum Sector of Pakistan and its Trade Dynamics

Researcher Name: Suleman Akram

Research Editor: Salman Raza

Research Head: Dr. Khalid Mustafa



Research Wing

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For any queries or feedback regarding this publication, please contact
at suleman.akram@tdap.gov.pk

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Suleman Akram
Research Associate
Trade and Development Authority of Pakistan



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List of Abbreviations

FY	Fiscal Year
HSD	High Speed Diesel
MT	Million Tons
NRL	National Refinery Limited
OCAC	Oil Companies Advisory Council
PARCO	Pak Arab Refinery Limited
PRL	Pakistan Refinery Limited
PSO	Pakistan State Oil
TBPD	Thousand Barrel Per Day
UAE	United Arab Emirates



Executive summary

Demand for petroleum products in Pakistan is 19 million tons (MT), while Pakistan produces almost half of its petroleum needs through domestically produced crude oil and processing imported crude at domestic petroleum oil refineries. The three sectors that depend on petroleum products are transportation, energy and industry. Transportation uses 59%, electricity uses 32% and industry uses 8% of petroleum products. This study identified the problem of importing petroleum products from more expensive countries. Pakistan often buys from these countries due to deferred payment and trade relations with these countries. Low production capacity of refineries is another problem in Pakistan and this problem also reduces petroleum exports as Pakistan mainly exports refined petroleum products like petroleum jelly, naphtha etc. All refineries are operating at 60% of total capacity. This study aims to explore the possibility of reducing Pakistan's import bill and increasing exports of petroleum products.

According to ITC Trademap, in 2020, petroleum goods imported into Pakistan under HS-Code 2710 and HS-Code 2709 were \$6.462 billion. It accounts for 14% of Pakistan's total imports. On the other hand, goods according to HS-Code 27 were \$10.13 billion, accounting for about 22% of Pakistan's total imports. Pakistan mainly imports crude oil from the UAE 56%, Saudi Arabia 34% and Kuwait 4%. While Pakistan imports refined petroleum products from the UAE 52%, Kuwait 17% and Oman 6.6%. Since Pakistan is a net importer of petroleum products, Pakistan can save foreign exchange by importing petroleum products at low prices and refining crude oil at domestic refineries.

The findings of the report suggest it is more beneficial for Pakistan to buy refined petroleum products from Saudi Arabia and Malaysia as compared to the UAE. For crude oil, Indonesia and Saudi Arabia are the best markets for Pakistan as they offer the lowest price. Pakistan's exports can be increased by expanding the refining capacity of existing petroleum refineries and establishing new oil refineries in the country. This process can be facilitated by incentivizing the investors and lowering the tariffs on refining machineries which are currently high. By using only crude petroleum, Pakistan can save USD 923 million by importing



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only crude oil. Freight cost of oil tanker is not available. As freight cost keeps on fluctuating, therefore it was not possible to conduct a freight cost analysis.



Chapter 1 Introduction

Petroleum reserves are the backbone of any country's Economy. Pakistan is the 33rd largest oil consumer in the world with a per capita consumption of 41.9 gallons of oil. Pakistan is endowed with huge hydrocarbon potential, most of which remains untapped. According to the technical assessment, the initial recoverable reserves were 1,515 million barrels of oil. Pakistan has a large sedimentary area. Only 1,123 exploration wells and 1,496 appraisal/development wells have been drilled to date with an average drilling density of 3 wells per square kilometer. These wells have had 411 discoveries with a success rate of 1:2.8, which is quite intriguing. About 95% of these wells are concentrated in Indus Basin whereas Baluchistan, Khyber Pakhtunkhwa & the Off-shore area is virtually unexplored¹. In Pakistan, Petroleum has three main uses: transportation, energy and industry. Transport sector uses 60%, power sector 32% and industry sector 8%². In the FY 2019-20 the consumption of petroleum products (energy products) in Pakistan was 19.7 million tons/annum against the supply of 11.6 MT per annum from local refineries, while the rest of the 8.1 MT were imported³. According to OIL Companies Advisory Council OCAC in 2030, the demand for petroleum products will be double compared to 2019. Therefore, Pakistan will need to spend a huge money to fulfill the domestic need of petroleum products. Pakistan's indigenous oil production meets only about 1/5th of the country's current oil needs and the rest is met through high-cost imports. Unless the current production decline is reversed, costs of petroleum products will continue to increase. In Pakistan, crude oil processing infrastructure is underdeveloped as there are only 6 refineries in operation, which are insufficient to meet the country's demands. All of these refineries are way out of date and unable to function at peak capacity. Pakistan imports more refined oil than low-cost crude oil as a result of these infrastructure deficiencies. Pakistan is a developing country and steadily progressing, so more demand for petroleum products is needed as petroleum products are used in every sector.

This research looked at Pakistan's entire petroleum sector, including petroleum demand and supply, as well as barriers to new oil refineries being built in the country. The research also explored many difficulties and possibilities for making Pakistan's imports cheaper or relying on its indigenous resources.

¹ <http://www.mpnr.gov.pk/Detail/MTMyZTRiMjltMTA4YS00MTJlTg1NjUtY2IxMTc0MzYyNGFj>

² Malik, A. Gas and Petroleum Market Structure and Pricing.

³ Economic survey of Pakistan, Government of Pakistan, Finance Division



Pakistan's Trade Profile of Petroleum Products

Pakistan is a net importer of petroleum products. From 2016 to 2018 imports grew whopping by 80%. In 2018, Pakistan faced a significant deficit of USD 16,715 million due to increase in crude oil prices by 35 % in international market recorded at USD 77 per barrel.⁴

Pakistan imports crude and refined oil every year and spends significantly its foreign exchange reserves. Until 2018, the gap between imports and exports widened due to higher domestic demand. The drop in petroleum products in 2019 was due to covid19. In 2020, Pakistan's import bill of petroleum products stood at \$10,313 million, accounting for 22% of Pakistan's total imports.

1.1 Major Imports and Exports Partners of Pakistan

1.1.1 Exports of Petroleum Products

Pakistan's major export destinations are UAE, Malaysia, Korea, Singapore, Afghanistan, and China. Pakistan has cumulatively earned USD 191.7 Million in 2020 through exports. Pakistan exports petroleum products to the United Arab Emirates for USD 106 million, USD 23 million to Malaysia, USD 20 million to South Korea, USD 17 million to Singapore and USD 11 million to Afghanistan.

Pakistan exports Products under the HS-code 27 to UAE 55%, Malaysia 12%, Korea 11%, and Singapore 9%. Cumulatively Pakistan exports petroleum products worth USD 191.41 million. In 2016-2020, Pakistan's exports of products from HS-Code 27 increased by 8% to a global value of USD 0.03 million. The exports to UAE increased by 212% to a value of USD 0.10 million, whereas it increased by 845% accounting for USD 0.01 million with Korea.

1.1.2 Imports of Petroleum Products

Pakistan's major importing partners in 2020 were UAE, Qatar, Saudi Arabia, Kuwait, South Africa, and Oman. All these countries exported a total of USD 10313.085 million petro-products to Pakistan. Pakistan Imports petroleum products from the UAE worth USD 3,576 million, USD 1,341 million from Qatar, USD 892 million from Saudi Arabia, USD 831 million from Kuwait and USD 830 million from South Africa.

Pakistan imports from UAE and Qatar. Pakistan imports almost 50% from both countries. Between 2016 and 2020, Pakistan increased its imports by 22% from Qatar valued at USD 744 million, 22% from South Africa worth USD 480 million, while it decreased by 5% from Kuwait with a value of USD 164 million and 9% from United Arab Emirates with a value of USD 2 million. Pakistan imports two products of HS-Code 27: 35% from UAE, 13% from Qatar, and 8% from Saudi Arabia. Cumulatively Pakistan is importing

⁴ <https://www.macrotrends.net/1369/crude-oil-price-history-chart>



all these products worth USD 10313.05 million. During 2016-2020, Pakistan's import of HS-Code 27 increased by 2 % from World, 22% from Qatar, decreased by 9 % from the United Arab Emirates, and imports from Saudi Arabia remained stagnant.

Chapter 2 Cost and Benefit Analysis of Crude and refined Petroleum Products

This part of the study analyzes the import and export situation of the previous year and identifies potential countries where Pakistan can import at a lower rate and export at a higher rate in order to minimize the oil trade deficit.

2.1 Imports of crude oil and refined oil

This study examines the import and export of petroleum products at 4-digit, 6-digit, and 8-digit levels. Two products are analyzed: HS-Code 2710 (Refined Petroleum) and HS-Code 2709 (crude Petroleum).

2.1.1 Share of import products

Table 1
Import Share of Petroleum Products in Pakistan

Product	Value Million USD	Share of every Product (%)
Petroleum oils and oils obtained from bituminous minerals, crude (HS-Code 2709)	1983.027	25.64
Petroleum oils and oils obtained from bituminous minerals (excluding crude); preparations containing ... (HS-Code 2710)	5749.797	74.35

Source: ITC Trademap

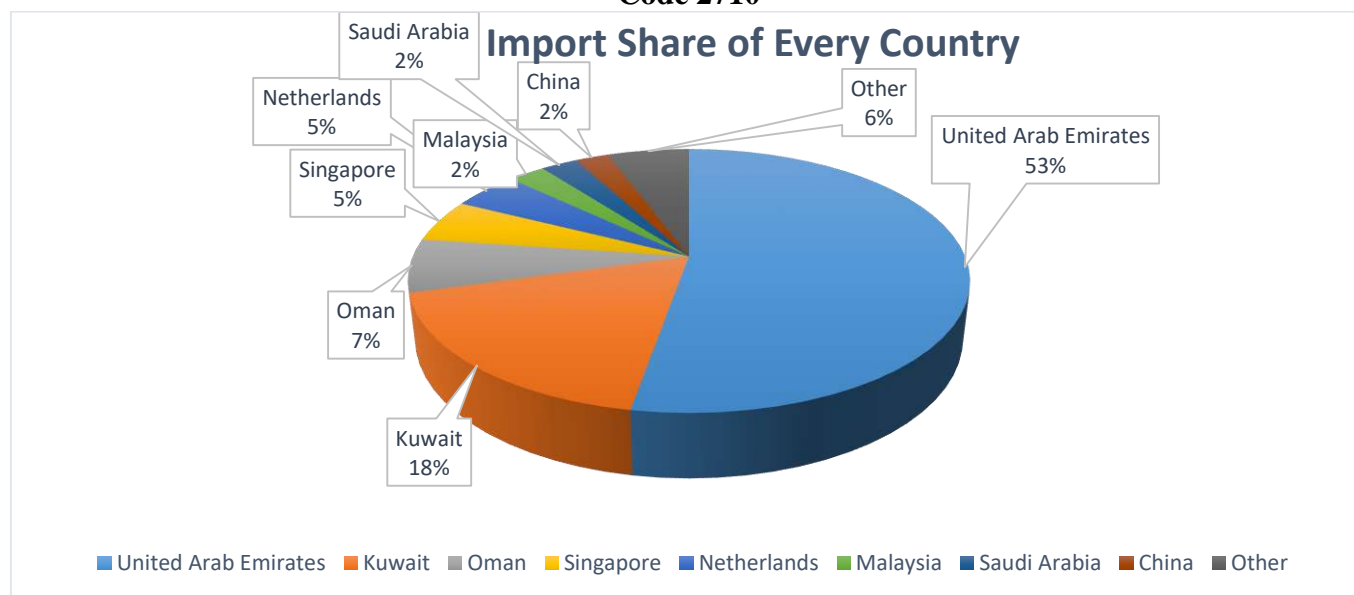
Pakistan imports two main products of Chapter 27: HS-Code 2710 and HS-Code 2709. The total share of HS-Code 2709 is 25.64% and HS-Code 2710 import share is 74.35%. Refined oil imports have higher import costs than crude oil, and various by-products can be produced by refining crude oil at local refineries.

2.1.2 Petroleum oils and oils obtained from bituminous minerals, excluding crude (HS-Code 2710)

The Refined Oil category includes all refined petroleum products such as HSD, automotive fuel, Naphtha, jet fuel, and more. Pakistan has imposed an average tariff of 10.6% on imports from all countries except China in 2020. China imposes a tariff of about 5% on the Pakistani market. Pakistan imports 12.5 MT from the world and spends nearly USD 4194.9 million per year. Pakistan's major importers are UAE, Kuwait, Oman, Netherlands, Malaysia, and Saudi Arabia. Pakistan import more than 90% of its total imports from these countries. UAE has a 40% share, Kuwait 18%, and Oman 7% as shown in figure 4. In terms of quantity Saudi Arabia exports more than Malaysia. At the HS-Code 4-digit level, it is beneficial for Pakistan to import this product from Saudi Arabia as Saudi Arabia offers the lowest price to Pakistan.

Figure 1

Proportion of imports of refined petroleum products from different countries to Pakistan with HS-Code 2710



Source: ITC Trademap

Production, Consumption and Import Overview of Refined Petroleum

This section provides an overview of refined petroleum products. Production, consumption and import. Table 2 shows that the production of refined petroleum products has grown at a slow pace over the years. However, Pakistan's imports declined from 2017 to 2019. In 2020, the gap between production and consumption of petroleum products reached 263,000 barrels per day.

Table 2
Production, Consumption and Import of 2710

Year	Refined Petroleum Production (TBPD)	Refined Petroleum Consumption (TBPD)	Refined Petroleum Import(TBPD)
2016	199.0	566	366.9
2017	210.3	589	378.6
2018	235.7	498	262.2
2019	217.3	446	228.6
2020	173.9	437	263.0

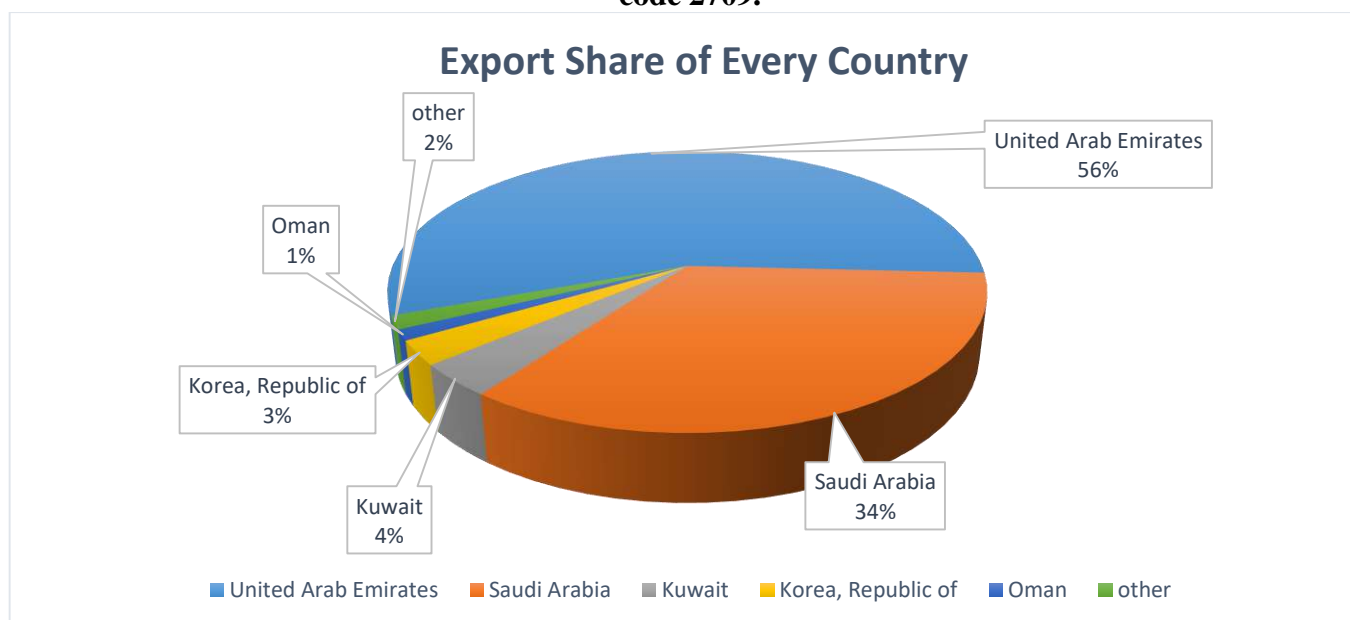
Source: ITC Trademap, British Petroleum, OCAC

2.1.3 Petroleum oils and oils obtained from bituminous minerals, crude (HS-Code 2709)

Crude oil is a mixture of hydrocarbons that exist as a liquid in underground geological structures and remain liquid when brought it to the surface. Through processing, it is possible to produce various products such as HSD and other oil. In 2020 Pakistan imports product under HS-Code 2709 from 10 countries worth USD 2.267 billion and 7.3 million tones quantity. Pakistan has imposed an import duty of 3% on Crude Oil. The major partner countries are UAE, Saudi Arabia, Kuwait, South Korea, Oman, Indonesia, Australia, United States and Netherlands. Indonesia offers the lowest unit price at USD 216 per ton, while UAE offers USD 326 per ton and Saudi Arabia offers USD 287 per ton. So, Pakistan can import more from Saudi Arabia and Indonesia at Lower rates.

Figure 2

Proportion of imports of refined petroleum products from different countries to Pakistan with HS code 2709.



Source: ITC Trademap

Production, consumption and Import Overview of Crude Petroleum

Table 3 shows the situation of crude oil production, consumption and import. Crude oil production and imports have declined over the years. Since imports are almost twice as much as production, this situation has increased the cost of imports for Pakistan.

Table 3
Production, Consumption and Import of Crude Oil

Year	Crude Petroleum Production (TBPD)	Crude Petroleum Import (TBPD)	Crude Petroleum Consumption (TBPD)
2016	85.5	127.6	213.1
2017	89.6	171.6	261.2
2018	89.5	180.4	270.0
2019	84.9	168.4	253.4
2020	76.7	133.6	210.3

Source: Trademap, British Petroleum, OCAC

Table 4
Major Import Partners of Refined and Crude Oil

Summary Table of Major Importing Partner of Pakistan		
Ranking of Exports to Pakistan	2710	2709
1 st	UAE (52.2%)	UAE (56%)
2 nd	Kuwait (17.8%)	Saudi Arabia (34%)
3 rd	Oman (6.6%)	Kuwait (4%)
4 th	Singapore (5.2%)	Republic of Korea (3%)
5 th	Netherlands (4.6%)	Oman (1%)

Source: ITC Trademap

Table 4 shows the percentage of imports of refined petroleum products and crude oil by country.

In refined petroleum products, Pakistan imports 52% from the UAE, 17% from Kuwait and 6.6% from Oman. All of these countries account for a major share 75% of Pakistan's imports of refined petroleum products.

In crude petroleum products, Pakistan imports 56% from the UAE, 34% from Saudi Arabia. Both countries account for a major share (90%) of Pakistan's imports of crude petroleum.

2.1.4 Imports of Refined oil products of Pakistan at 6 digit HS-Code

At the HS-CODE 8-digit level and HS-CODE 6-digit level, only 10 products are selected as these 10 products represent more than 95% of Pakistan's imports in the petroleum sector. Data for 2019 is being analyzed as data for 2020 is not published yet.

Light Oils and Preparations (HS-Code 271012)

In this category; high speed diesel, Naptha, White spirit and many other products are included. In 2019, Pakistan imported 53.08 MT of products under HS-Code 271012, with an import value of USD 3523.7 Million. In the HS-Code 2710 category, this product's share of imports is 99%. In terms of value, Pakistan's main import partners are the UAE, Netherlands, Singapore, Iran, and Oman. Pakistan imports 63% from UAE, 13.5% from the Netherlands, 8.3% from Singapore, 8.1% from Iran, and 2.8% from Oman. Quantitatively, Pakistan imported 347.89 MT from the UAE and 69 MT from the Netherlands. Malaysia has set the lowest price among all its trading partners. The average unit price was USD 6.61 per ton and in Malaysia was USD 1.74 per ton. The UAE has the lowest tariffs on Pakistan after Malaysia. The average unit price suggested by the UAE was USD 6.3 per ton. If Pakistan had imported entire quantity from Malaysia, it would have saved USD 2594 million. Whereas, importing entire quantity from UAE would have saved USD 118.2 million.

Medium Oils and Preparations (HS-Code 271019)

In this category; kerosene, lubricant oil, furnace oil and different mineral waxes are included. In 2019, Pakistan imported 5.14 MT of goods under HS-Code 271019, and Pakistan had spent USD 1,863.41 million on imports of this product. This product has 0.06% share of the import of refined petroleum products. Kuwait, United Arab Emirates, South Korea, Saudi Arabia, Singapore, Qatar and Oman are Pakistan's major import partners. Pakistan imported 51% from Kuwait, 34% from the UAE, 3% from South Korea, 2% from Saudi Arabia, 2% from Singapore, 1% from Qatar and 1% from Oman. Quantitatively, Pakistan imported 2.1 MT from Kuwait, 1.4 MT from the UAE, and 1.1 MT from South Korea. Saudi Arabia has offered a minimum price of USD 37.2 per ton. If Pakistan imported all the quantities from Saudi Arabia, it could save USD 167.9 million.

At six digit HS code, it is estimated that Pakistan could save at least USD 525.2 million in 2019.

2.1.5 Imports of Refined oil of Pakistan at 8 digit HS-Code

Motor Gasoline (HS-Code 27101210)

Motor gasoline used in car buses and other motor vehicles. Pakistan's main importing partners for products with HS-Code 27101210 are the United Arab Emirates, Netherlands, Singapore, Oman and Malaysia. In



total, Pakistan spent USD 3,377.5 million, amounting to 489.32 MT. Malaysia, UAE and Pakistan were offered the lowest prices in 2019. If Pakistan had imported entire quantity from Malaysia, it could have saved USD 256.46 million, whereas, if imported from UAE, it could save USD 268 Million.

White Spirit, Solvent (HS-Code 27101240)

White spirit is used as an extraction solvent, the main use of white spirit in paint, wood and cleaning industry. Iran, South Korea and the United Arab Emirates were Pakistan's main trading partners in 2019. Pakistan imported 41.39 MT and spent USD 103.18 million on the product HS-Code 27101240. Iran and United Arab Emirates offered the lowest prices in 2019, at USD 2.3 and USD 6.4 per ton. If Pakistan had bought all required quantities from Iran, it could have reduced \$4.4 million from the import bill.

Naphtha (HS-Code 27101290)

Naphtha is commonly used as a solvent. It is used in hydrocarbon cracking, laundry soaps, and cleaning fluids naphtha also used in making plastic products. Romania, Iran, United Arab Emirates, and Thailand were the major trading partners for this product. Approximately 1.3 MT were imported in quantity for USD 11.5 million. The UAE provided USD 0.94 per ton in 2019, while South Korea provided USD 1.6 per ton. Importing all quantities from the United Arab Emirates could save Pakistan USD 10 million, while from the Republic of Korea, Pakistan could save USD 9.3 million.

High Speed Diesel Oil (HS-Code 27101931)

HSD is normally used as a fuel in medium and high speed compression ignition engines like locomotives, buses and pumps. Pakistan imported 294.46 MT and spent USD 140.237 million in 2019. The main import partners were Kuwait, UAE, Singapore, Saudi Arabia and Qatar. Singapore and the UAE offered the lowest prices of USD 2.9 and USD 4.2 per ton. Pakistan could have reduced 524 million dollars and USD 150 million from the import bill, if it had imported entire quantities from Singapore and UAE, respectively.

Kerosene Type Jet Fuel JP-1 (HS-Code 27101912)

Aviation fuel or jet fuel is a fuel designed for use in aircraft powered by gas turbine engines. In 2019, 24.07 MT of these products were imported and nearly USD 19.77 million were spent. UAE, Oman, Kuwait and Netherlands were important import partners for this product. Oman offered Pakistan the lowest price (USD 2.5 per ton). Sourcing full quantities from Oman could save Pakistan USD 47.7 million.

Electrical Insulating Oils (HS-Code 27101993)

Electrical insulating oils are used in oil transformers, some types of high voltage capacitors, fluorescent ballasts, and some types of high voltage switches and circuit breakers. In 2019, 9.34 MT of products were imported, of which nearly 90.63 million dollars was spent. The United Arab Emirates, Singapore, South Korea and Saudi Arabia were the main import partners for this product. UAE and Singapore offered

Pakistan the lowest prices at USD 2.4 and USD 9.4 per ton, respectively. If Pakistan had imported all required tons from the UAE, it could have reduced USD 67.8 million from the import bill. Whereas, if it imported the same from Singapore, it could save USD 2 million.

Lubricating Oils Heavy (HS-Code 27101999)

Lubricating oils are liquid substances used to significantly reduce friction between two surfaces in contact with each other. This helps reduce heat and controls heat while moving mechanical components. In 2019, 7.55 MT of product HS-Code 27101999 was imported. The import bill for this product was 19.39 Million dollars. The major import partners of Pakistan included: Iran, UAE, Japan, China, and Germany. Iran and Saudi Arabia offered the lowest price to Pakistan, USD 1.3 and USD 1.39 per ton. Sourcing entire quantities from Iran could save Pakistan USD 9.5 million; from Saudi Arabia it could save USD 8.8 million.

Furnace Oil (HS-Code 27101941)

Furnace oil is mainly used for steam boilers in power plants, ships and industrial facilities. UAE and Kuwait were the main trading partners for this product in 2019. Furnace oil imported 369 MT worth USD 168.60 million. The lowest price offered by Kuwait was USD 410.9 per ton in 2019. Importing all required tons from the UAE could save Pakistan USD 16.7 million.

2.2 Exports of crude oil and refined oil

Pakistan has started exporting petroleum products to 20 countries around the world. Pakistan earned USD 191.7 million in Dec 2020. More than 550 companies registered in Pakistan export petroleum products. Our main petroleum products are exported to UAE, Malaysia, South Korea, Afghanistan and China. The main export items are as follows.

2.2.1 Share of Export Products

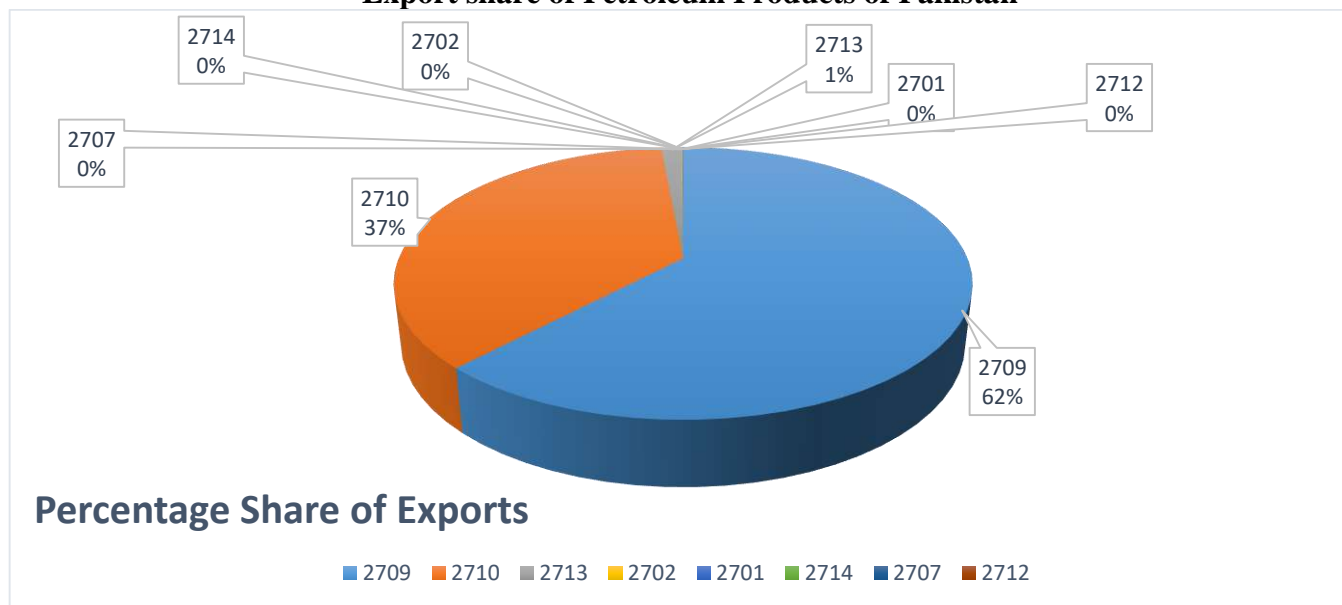
Pakistan exports eight different products under HS-Code 27 to other countries, but only two products are listed in this study, and their export share is shown in table 5 and Figure 3.

Table 5
Export share of Petroleum Products of Pakistan

Product description	Value Million USD	share of every Product
Petroleum oils and oils obtained from bituminous minerals, crude (HS-2709)	119.122	62.138
Petroleum oils and oils obtained from bituminous minerals (excluding crude); preparations containing ... (HS-2710)	697.92	36.406

Source: ITC Trademap

Figure 3
Export share of Petroleum Products of Pakistan



Source: ITC Trademap

Table 5 lists only two products exported by Pakistan. The share of crude oil exports is 62% and refined petroleum products 36%. Figure 8 shows Pakistan's major petroleum product exports.

2.2.2 Petroleum oils and oils obtained from bituminous minerals, crude (HS-Code 2709)

Pakistan exports oil extracted from crude oil and bituminous minerals to three countries: UAE, Malaysia, Singapore and Papua New Guinea. Overall, Pakistan earns USD 119.12 million from sales of 0.41 MT. The UAE imports Pakistan's highest export price of USD 332 from Pakistan. If we sell all quantities to UAE, Pakistan can earn USD 5.87 million dollars more.

2.2.3 Petroleum oils and oils obtained from bituminous minerals excluding crude (HS-Code 2710)

Pakistan exports its products to 13 countries. More than 90% of exports go to the UAE, South Korea, Afghanistan and China. Pakistan exports 37% to the UAE, 16% to Afghanistan and 9% to China. Overall, Pakistan earned USD 69.79 million from sales of 2 MT. Pakistan has the advantage of exporting petroleum products to Afghanistan over the UAE. Selling refined oil to Afghanistan could give Pakistan an additional USD 7.3 million in revenue.

At 4 digit level Pakistan can earn USD 13.19 Million more by export to those countries which are offering higher price.

Table 6
Major Export Partners of Pakistan in Refined and Crude oil

Summary Table of Major Export Partners of Pakistan		
Ranking of Exports to Pakistan	2710	2709
1 st	UAE (67%)	UAE (37%)
2 nd	Malaysia (18%)	Republic of Korea (29%)
3 rd	Singapore (13%)	Afghanistan (16%)
4 th	Papua New Guinea (0.16%)	China (9%)

Source: ITC Trademap

Pakistan exports 67% of its petroleum products to the UAE, 18% to Malaysia and 13% to Singapore. Pakistan exports 98% of its refined petroleum products to these 3 countries.

As for crude oil, Pakistan exports 37% to the UAE, 29% to Korea and 16% to Afghanistan. Pakistan exports 82% of its crude oil to these three countries.

2.2.4 Export Analysis of Refined oil of Pakistan at 6 digit HS-Code

Pakistan's main trading partners for HS-Code 271012 are Afghanistan, South Korea, United Arab Emirates, Singapore and India. Overall, Pakistan earned USD 123.6 million from exporting these products. Exports amounted to 225 MT. The unit price of this product exported to Afghanistan was USD 668 per ton. Pakistan could have earned USD 27.4 million in exports to Afghanistan alone.

In 2019, HS-Code 271099 product was exported to Afghanistan with the amount of 19 tons and Pakistan obtained USD 3000.

Only 10 tons of HS-Code 271012 products were exported but the value was not reported by the ITC-Trademap.

2.2.5 Export Analysis of Refined oil of Pakistan at 8 digit HS-Code

Kerosene Type Jet Fuel (HS-Code 27101919)

Pakistan exports to only one country, Afghanistan. Pakistan exports 91,863 tons and imports USD 62.13 million.



Petroleum Top Naptha (HS-Code 27101942)

Petroleum naphtha is used as a solvent, cleaning and dry cleaning fluid, paint, and varnish thinner, asphalt thinner, solvent for the rubber industry, recycled products, cigarette lighters, and fuel for portable camping stoves. In 2019, Pakistan exported 129,821 tons to six countries, including Korea, UAE, India, China, Singapore, Malaysia and Thailand, raising USD 60.09 million. South Korea and China offered the highest prices at USD 0.52 and USD 0.51 per kg. If Pakistan had exported entire amount to Korea, it could have earned an additional USD 1.25 million. Whereas, if entire amount was exported to China, Pakistan could have earned an additional USD 670,000.

Electrical Insulating Oils (HS-Code 27101993)

Pakistan exported this product to UAE in 2019. Pakistan exported 2,525 tons and earned a profit of USD 140,000.

Lubricating Oils Heavy (HS-Code 27101999)

Pakistan earned USD 323 million in 2019, exporting 431 tons to five countries: Nigeria, Afghanistan, Qatar, UAE and South Africa. Nigeria and Afghanistan offered the highest prices of USD 2.41 and USD 1.40 per kg. If the entire amount is exported to Nigeria, Pakistan could have earned USD 160,000 and in the case of Afghanistan this amount could be USD 470,000.

Other products.

Pakistan exports 5 different products: Brake Fluid (HS Code 27101994), Mineral Greases (HS-Code 27101992), Lubricating oil (HS-Code 27101951), Lubricating oil (HS-Code 27101952) and kerosene type jet fuel JP-1 (HS-Code 27101912). The total export volume is 1318 tons, with a total export value of USD 237 million.

Based on the availability of data, the study can conclude that Pakistan could receive at least USD 1.14 million to USD 1.44 million in additional revenue in 2019 under HS-Codes 27101942 and 27101999.

Chapter 3 Pakistan Oil Demand and Refining Infrastructure

There are 5 refineries in Pakistan. Pak Arab Refinery Limited (MCR), Attock Refinery Limited (ARL), Byco Petroleum Pakistan Ltd (Byco), National Refinery Limited (NRL) and Pakistan Refinery Limited (PRL) operate in Pakistan. The total capacity of these refineries is 19.37 million tons. Domestic refineries produce 11.59 MT and import the rest (8.09 million tons). As a result, these refineries are working on only 40% of their actual potential.

Table 7
List of Oil Refineries in Pakistan

Name of Refinery	Capacity	Area
Pak Arab Refinery Limited (PARCO).	100,000 bbl/d	Multan
Attock Refinery Limited (ARL).	53,400 bbl/d	Rawalpindi
Byco Petroleum Pakistan Ltd (Byco)	150,000 bbl/d	Hub
National Refinery Limited (NRL).	64,000 bbl/d	Karachi
Pakistan Refinery Limited (PRL)	50,000 bbl/d	Karachi

Source: Pakistan Economic Survey 2019-2020

These refineries do not reach their full potential. The main reasons are both financial and technical. On the financial side, circulating debt is the main issue, on the technical side, all refineries except PARCO are older versions, and the main product is naphtha, the cheapest fuel product.

PARCO is a joint venture between the Pakistani government and the UAE through investment company Mubadala. The Pakistani government owns 60% of PARCO and 40% of UAE.

Pharaon Investment Group Limited owns significant shares in Attock Refinery and National Refinery Limited.

The Abraj Group currently owns 40% of the shares. Perviz Abbassky is one of the founders of the Byco Refinery and now his son Amir Abbassky is the CEO of the Byco Refinery.

Pakistan Refinery Limited is controlled and owned by Pakistan State Oil (PSO). Almost 62% shares are owned by PSO.

3.1 Demand and Supply Analysis of Petroleum products

“Pakistan's consumption of petroleum products (energy products) is 19.68 MT per year, 11.59 MT are supplied annually by local refineries, and the remaining 8.09 MT are imported.”⁵.

Refined Petrol

Pakistan's total demand for refined gasoline is 7.6 MT per year. We meet 30% of our demand through our local refineries and import the rest from several countries.

⁵ Economic survey of Pakistan, Government of Pakistan, Finance Division

Refined Diesel

The total demand for diesel fuel is 7.3 MT per year, and only 65% of the demand comes from our refineries.

In table 8 the general consumption, manufacturing and import of petrol and diesel is mentioned.

Table 8
Production Consumption and Import of Petrol and Diesel in Pakistan

Product	Consumption (Million Tons)	Production (Million Tons)	Import (Million Tons)
Petrol	7.6	2.28	5.32
Diesel	7.3	4.745	2.555

Source: ITC Trademap

3.2 Comparison of Refined Petroleum Product Prices by neighbor countries

In this study, a cross-country analysis is done to look at the opportunities that from where Pakistan can import cheaply. China imports refined petroleum products and imposes a 6.1 percent tax on imports, and the average unit price is USD 415 per ton paying for import of refined petroleum. India, on the other hand, imposed 8.4% tariff on petroleum products and is paying USD 399 per ton. In the case of Pakistan, Pakistan pays USD 335 per ton to import refined petroleum and imposes a 10.6% duty on import. Thus, it is concluded that cheaper options for importing petroleum products no longer exist. What we can do is improve the refinery's technology to process crude oil and reduce the cost of various petroleum products and lower tariffs.

3.3 Investment barriers in the oil refining sector

In this section, the study analyzes key costs and tariffs as well as various other obstacles limiting foreign investment in Pakistan's oil sector.

3.3.1 Import duties on equipment used in the construction of refineries

This section describes import duties on equipment used in refineries. Data is collected from ITC Trademap for analysis.

Crude Distillation/Rectifying Plant

This is a major component of a petroleum oil refinery. The plant produces diesel gasoline gas and other petrochemicals at various temperature levels. Pakistan has applied an average 20% import duty on crude oil distillation/rectification equipment. The main producers and exporters of this plant are Malaysia, Korea and China, but Pakistan imports from China and Switzerland. This study compares Pakistan's tariffs on Crude Distillation Plant with neighboring countries. India has imposed a 7.5% duty on all countries except



Vietnam 0% and Japan 2.5%, but India imports from Japan. China has imposed a 10% tariff on all countries except Switzerland, Singapore and Malaysia, which is 0%. And China imposes a 5% tariff on South Korea.

Pakistan can get this plant at cheaper price if tariffs are lowered. More companies will attract investment.

Liquid Elevators

Liquid elevators are used in oil refineries. Pakistan has imposed an 11% tariff on all countries except China, which is 5%. Pakistan imports these products from China and the UAE, but the main producers are Germany, UK, Taiwan and Russia. India imposes a 7.5% tariff on all countries except Malaysia, which is 0 percent.

Pumps and compressors

Air and vacuum pumps and gas compressors are essential parts of a refinery. The major export countries in world are China, Germany, USA, Japan, and Italy. Pakistan applied a 14.9% tariff on all countries except for China and Malaysia which is 9.5%. India has imposed import tariffs of 1-5% on several countries, and China has imposed import tariffs of 0-7.4% on several countries.

Centrifuges and centrifugal dryer

Major exporting countries in world are Germany, China USA, Mexico, and the UK. Pakistan is charging a minimum of 0% and a maximum of 11.2% tariff from different countries. India has imposed 0% - 5.5% tariff on different countries. While China has imposed 0%-4% tariff on different countries except for Malaysia, which is 7%.

Tubes, pipes and hollow profiles

China, Japan, Germany, Italy and France are the main producer and export countries for this product. Pakistan has imposed a 16.8% tariff on all countries except China, which is 15.8%. In neighboring countries, India has applied tariffs from 0% to 10% to different countries. China has imposed a 4.9% tariff on all countries except Korea (1.3%) and Australia (0%).



Table 9
Comparison of Import Duty on Refinery Machinery in different Countries

Equipment	China	India	Pakistan
Crude Distillation Plant.	10%	0-2%	20
Liquid Elevators.	10% Malaysia 0% R. Korea 5%	7.5% Vietnam 0% Japan 2.5%	11% China 5%
Pumps and compressors.	0-7.4gy%	1-7.5%	14.9% china 9.5% Malaysia 9.5%
Centrifuges and centrifugal dryer.	0-4%	0-5.5%	0-11.2%
Tubes, pipes and hollow profiles.	4.9% R. Korea 1.3% Australia 0%	0-10%	16.8% China 15.8%

Source: ITC Trademap

3.4 Obstacles to Establishing New Petroleum Oil Refineries

Meeting with the official of Oil Companies Advisory Council. Following hurdles have been identified by the secretary general of OCAC.

- One time tax and duties exempted for the construction of new refineries and a minimum of 10-year tax holiday given in the energy policy of Pakistan⁶. However, these incentives are given only for deep conversion new refineries.
- Existing refineries are based on hydrocracking based technology they are enjoying higher profit margin so the new latest deep conversion refinery cannot compete. On international level, Hydrocracking technology is abandoned and Pakistan may face different sanctions if Hydrocracking petroleum refineries are allowed in Pakistan.
- No minimum rate of return is assured by government of Pakistan. Government of Pakistan had given the incentive of 25% rate of return to PARCO for 6 years on setting up new refinery in Pakistan. In past, government had given 20-25% rate of return to all refineries.
- Ex refinery petroleum product price and import price of crude oil is under the control of the Government which is a major issue for setting up new refineries. All refineries demands supply and demand based pricing mechanism.
- Oil refineries are capital intensive while profit margins are not high so most of the investment companies are hesitant to invest.

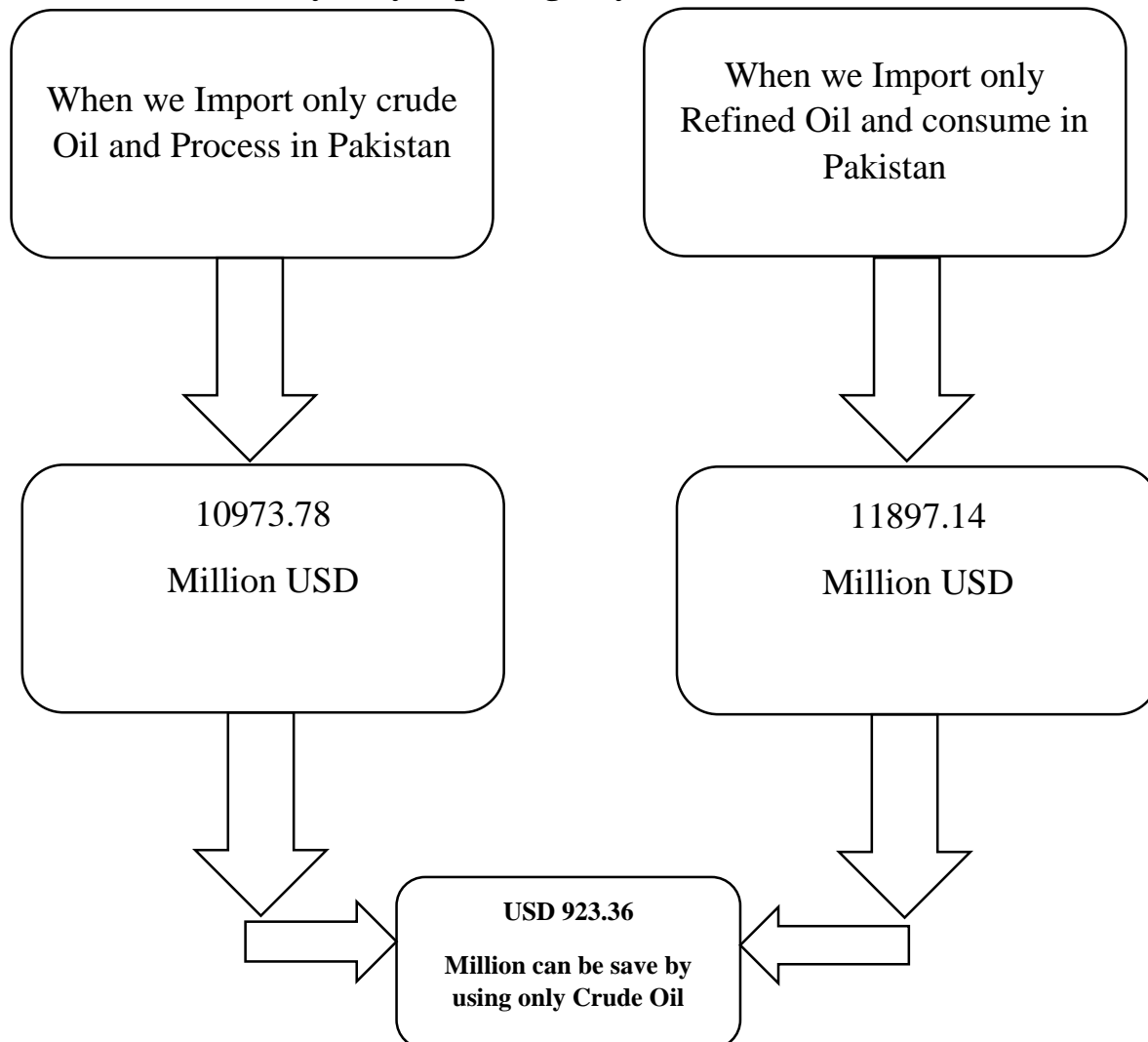
⁶ Petroleum Policy 1997, Ministry of Energy (Petroleum Division), Pakistan



- On Assets insurance side insurance companies demand more risk premium in Pakistan as Pakistan is situated in war zone.
- There are some issues between Iran and Gulf countries on Strait of Hormuz. So, UAE has diverted their investment from Pakistan to construction of crude petroleum pipeline named Fujairah pipeline in their own region. So if Iran blocks the Strait of Hormuz, their crude supply will not be affected. Same is the case of Saudi Arabia, they are delaying their investment in Pakistan due to tensions with Iran.

Chapter 4 Case study

4.1 Cost benefit Analysis by importing only crude oil



Source: ITC Trademap and OCAC

If Pakistan imports only crude oil instead of refined oil, it will need USD 10973.78 Million. If Pakistan imports only refined oil without importing refined oil, it will need USD 11,897.14 million. Refining crude oil at local refineries could save USD 923.3 million.

Chapter 5 Comparison of Pakistan's Crude Oil Import with Some Asian Countries

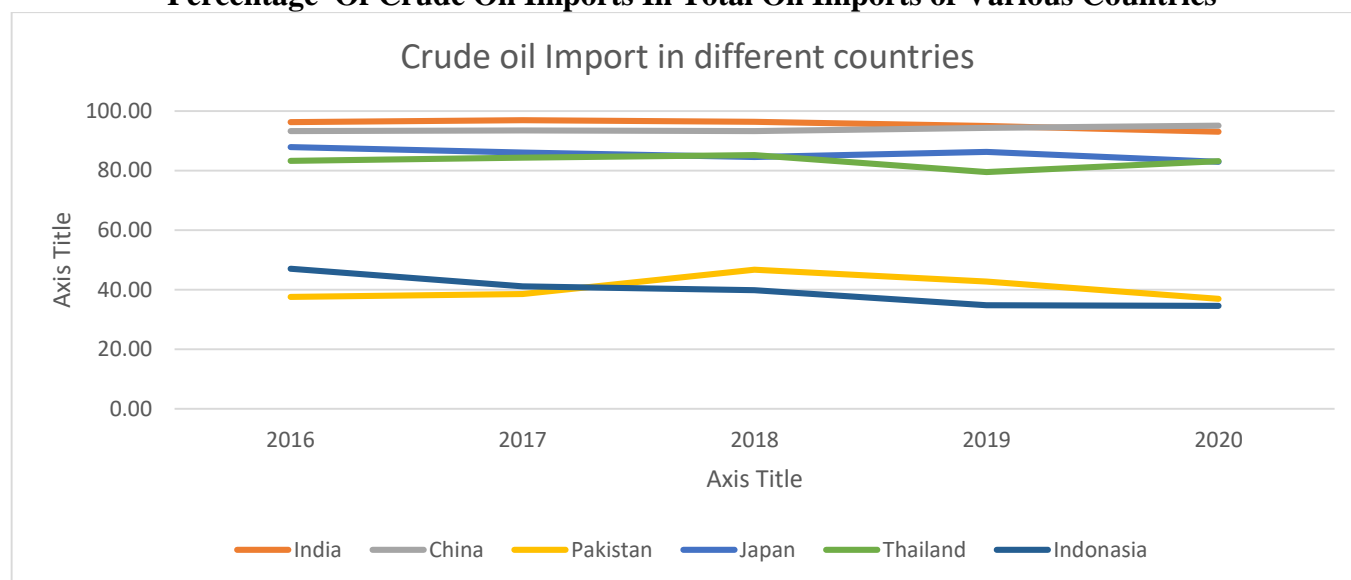
Table 10
Crude Oil Import as Percentage of Total Oil Import in Different Countries

Year	India	China	Pakistan	Japan	Thailand	Indonesia	Sri-lanka
2016	96.21%	93.21%	37.54%	87.88%	83.25%	47.01%	
2017	96.91%	93.40%	38.52%	86.08%	84.30%	41.08%	25.30%
2018	96.40%	93.28%	46.65%	84.53%	85.18%	39.79%	
2019	95.00%	94.30%	42.07%	86.20%	79.48%	34.74%	30.96%
2020	93.03%	95.02%	36.96%	82.91%	83.17%	34.57%	33.45%

Source: ITC Trademap

A comparison of several countries is made on crude oil imports. All selected countries are net importers of petroleum products. According to data compiled by ITC Trademap, India, China, Japan, and Thailand are the countries that import more than 90% of crude oil compared to refined oil.

Figure 4
Percentage Of Crude Oil Imports In Total Oil Imports of Various Countries



Source: ITC Trademap

India and China are importing more than 90% crude oil while Japan and Thailand are importing more than 80% crude oil, Pakistan, Sri Lanka and Indonesia are importing around 35% crude oil while Nepal and Cambodia are using refined oil almost 100%. Indonesia is rapidly relying on internal reserves almost 10% decreasing its petroleum imports annually.



Chapter 6 Conclusion

Based on analysis of imports and exports of crude oil and refined oil, it can be concluded that Pakistan can enter the new oil import market at relatively low prices. However, it is impossible to import the entire quantity from one country. So, Pakistan has to negotiate with several countries for lower prices. Similarly, in the export sector, Pakistan must seek market diversification opportunities.

The above analysis of the refining sector shows that the government should provide maximum incentives to the refining sector and to allow foreign investors to build oil refineries in the upper parts of Pakistan where consumption is higher than in the lower parts.

Owing to fluctuations in the freight cost, it became difficult to analyze various markets for export diversification.



6.1 Recommendations

- Government should diversify their import of petroleum products from different countries, as suggested by the 4-digit, 6-digit, and 8-digit HS-Code analysis.
- In Pakistan, used petroleum Oil refineries may allowed because they require less capital than new ones.
- All refineries must be exempt from taxes and duties to be able to compete on the same terms. According to the 1997 oil policy, tax and duty exemption for new refineries are 20 years, and the modernization exemption for old refineries is 10 years.
- To entice companies to invest in Pakistan, a minimum rate of return must be established over a period of time.
- Governments need to attract investment in pipeline infrastructure. This will encourage companies to set up oil refineries in central and upper Pakistan.
- Government should give incentives to storage companies in the private and public sectors. It may impose a temporary levy on petrol and diesel for facilitating the construction of storage facilities. The storage facility helps any country from fluctuating oil prices, and even some countries re-export their excessive petroleum products when prices are high, like India.

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Annexure

List of HS-Code and Description

HS-Code 2710	Petroleum oils and oils obtained from bituminous minerals
HS-Code 2709	Petroleum oils and oils obtained from bituminous minerals, crude
HS-Code 271012	Light oils and preparations, of petroleum or bituminous minerals which \geq 90% by volume "incl. losses" distil at 210°C "ASTM D 86 method" (excl. containing biodiesel)
HS-Code 271019	Medium oils and preparations, of petroleum or bituminous minerals, not containing biodiesel, n.e.s.
HS-Code 271099	Waste oils containing mainly petroleum or bituminous minerals (excluding those containing polychlorinated biphenyls [PCBs], polychlorinated terphenyls [PCTs] or polybrominated biphenyls [PBBs])
HS-Code 27101240	Light oils and preparations, of petroleum or bituminous minerals which \geq 90% by volume "incl. losses" distil at 210°C "astm d 86 method" (excluding containing biodiesel): white spirit
HS-Code 27101210	Light oils and preparations, of petroleum or bituminous minerals which \geq 90% by volume "incl. losses" distil at 210°C "astm d 86 method" (excluding containing biodiesel): motor spirit
HS-Code 27101290	Light oils and preparations, of petroleum or bituminous minerals, n.e.s. (excl. containing biodiesel, for undergoing chemical transformation, and special spirits, motor spirit and spirit type jet fuel) Nephta
HS-Code 27101931	Medium oils and preparations, of petroleum or bituminous minerals, not containing biodiesel, n.e.s: gas oils: high speed diesel oil
HS-Code 27101912	Medium oils and preparations, of petroleum or bituminous minerals, not containing biodiesel, n.e.s: kerosene, including kerosene type jet fuel: j.p.1
HS-Code 27101993	Medium oils and preparations, of petroleum or bituminous minerals, not containing biodiesel, n.e.s: other: base oil for lubricating oils of subheadings 2710.1951, 2710.1952 and 2710.1953
HS-Code 27101999	Medium oils and preparations, of petroleum or bituminous minerals, not containing biodiesel, n.e.s: other: other
HS-Code 27101941	Medium oils and preparations, of petroleum or bituminous minerals, not containing biodiesel, n.e.s: fuel oils: furnace-oil
HS-Code 27101919	Medium oils and preparations, of petroleum or bituminous minerals, not containing biodiesel, n.e.s: kerosene, including kerosene type jet fuel: other
HS-Code 27101942	Medium oils and preparations, of petroleum or bituminous minerals, not containing biodiesel, n.e.s: fuel oils: petroleum top naptha
HS-Code 27101994	Medium oils and preparations, of petroleum or bituminous minerals, not containing biodiesel, n.e.s: other: brake fluid
HS-Code 27101992	Medium oils and preparations, of petroleum or bituminous minerals, not containing biodiesel, n.e.s: other: mineral greases



- HS-Code 27101951 Medium oils and preparations, of petroleum or bituminous minerals, not containing biodiesel, n.e.s: lubricating oil, i.e., oil such as is not ordinarily used for any other purpose than lubrication, which has flash point at or above 200of by Abel's close test: in packs not exceeding 10 litres
- HS-Code 2710952 Medium oils and preparations, of petroleum or bituminous minerals, not containing biodiesel, n.e.s: lubricating oil, i.e., oil such as is not ordinarily used for any other purpose than lubrication, which has flash point at or above 200of by Abel's close test: in packs exceeding 10 litres
- HS-Code 27101912 Medium oils and preparations, of petroleum or bituminous minerals, not containing biodiesel, n.e.s: kerosene, including kerosene type jet fuel: j.p.1

Source: ITC Trademap