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Energy Pricing in India:
A Study on Taxes and Subsidies

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Abbreviations and Acronyms

APM	administered pricing mechanism
bbl	barrel
CIL	Coal India Ltd
CST	central sales tax
DBTL	direct benefit transfer for LPG
DPC	dynamic pricing charge
FOB	free on board
GCV	gross calorific value
GDP	gross domestic product
GoI	Government of India
GSPC	Gujarat State Petroleum Corporation
GST	goods and service tax
IOCL	Indian Oil Corporation Ltd
IPP	import parity price
LPG	liquefied petroleum gas
MMBTU	million metric British thermal unit
MMSCMD	million metric standard cubic metre per day
MMT	million metric ton
MoP	Ministry of Power
MoPNG	Ministry of Petroleum and Natural Gas
MT	metric ton
NBP	National Balancing Point
NELP	New Exploration Licensing Policy
OIDB	Oil Industry Development Board
OIL	Oil India Ltd
OMC	oil marketing company
ONGC	Oil and Natural Gas Corporation
PDS	public distribution system.
PLF	plant load factor
PPAC	Petroleum Planning &Analysis Cell

PSC	production-sharing contract
PSU	public sector undertaking
RSP	retail selling price
SCCL	Singareni Collieries Company Ltd
SKO	superior kerosene oil
TERI	The Energy Resources Institute
UHV	useful heat value
VAT	value added tax
WAP	weighted average price

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Executive Summary

In India, the government has historically determined the prices of energy products and services in view of socio-economic considerations, such as providing universal energy access at affordable prices, meeting energy demand efficiently, ensuring greater sustainability, and supporting economic growth (Niti Aayog, 2017). Energy subsidies often act as policy tools to meet these objectives but do not always deliver, and thus require scrutiny. Otherwise, they could have distortionary impacts on the energy industry and possibly on the economy**.** Distorted markets provide incorrect market signals, affect the level of competition, and lead to inefficient allocation of resources.

The Energy and Resources Institute (TERI), supported by the Economic Research Institute for ASEAN and East Asia, (ERIA) conducted a comprehensive study across the oil and gas and coal value chain in India. This study tried to cover the rationalisation of energy pricing over time, the identification and assessment of the subsidies for energy consumption in the oil, gas, and coal sector, and the net indirect tax contribution from each segment covered under study – crude oil, natural gas, liquefied petroleum gas (LPG), kerosene, coal – to the government revenue for the reference year 2015/16, which was the latest available data at the start of the study.

The study brings out the efforts of the Government of India (GoI) in progressively moving away from energy subsidy and in rationalising energy pricing to reduce the subsidy and its negative implications. The government has implemented various reforms in the oil and gas sector to allocate resources efficiently without any distortionary impacts. One major reform is the transfer of subsidy directly to the beneficiaries through the direct benefit transfer for LPG (DBTL) programme; targeting of the beneficiaries through a unique identification number, thereby reducing the distortions in the LPG market and benefitting oil companies to manage their cash flow. Currently, domestic LPG and public distribution system kerosene are the only two segments provided with subsidy for their consumption for domestic purposes. As a part of the study, the team developed an inventory of subsidies and explored the extent of subsidies provided for each segment.

The team investigated the indirect tax structure, total tax collection, and its flow for 2015/16 from each segment – crude oil, natural gas, LPG, kerosene, and coal. The team observed that some indirect tax components were strongly influencing the delivered price of energy, especially in certain segments, and thus its competitiveness and consumption across the country. In case of crude oil, LPG, and kerosene, taxes and subsidies were analysed at the national level through literature review and estimation. In segments such as natural gas and coal consumption in the power sector and natural gas consumption in fertiliser, the study was conducted for a sample state due to the lack of available data.

In India, affordability is the central focus of energy policy; thus, the competitive sources of energy such as coal continue to remain in the economy, especially as mainstay of electricity generation. However, the conflict between cost competitiveness and the commitment to address climate change concerns and pollution calls for the rationalisation of energy pricing and taxation.

Some key findings of the study are as follows:

- The oil and gas sector is a major contributor to government's fiscal revenues, contributing almost one-fourth of total indirect tax collection in 2015/16.

- Energy pricing in the oil and gas sector has been progressively rationalized to reduce the subsidy and distortion, but it is incomplete, particularly in the domestic LPG and PDS kerosene segments.

- The progressive rationalisation in the oil and gas sector, along with the lowered crude oil prices, led to an increased net indirect tax revenue by 61.5% between 2012/13 and 2015/16, from 31% net indirect tax revenue in 2012/13 when the crude oil price averaged at US$108/barrel (bbl) to 92.5% in 2015/16 when the price of crude oil fell and averaged at US$46/bbl.

- The share of under-recoveries out of the total indirect tax revenue from the oil and gas sector also decreased by 65% between 2012/13 and 2015/16. This resulted in the reduced subsidy provided under the budget of the Government of India in the oil and gas sector by almost 25.96% out of the total petroleum subsidy budgeted between 2012/13 and 2015/16.

- In India, subsidies once allocated tend to become entrenched and seem to have been rarely revised based on indicators like capacity to pay (inflation indexation, wage indexation, GDP/capita indexation).

- The fluctuation in the landed price of natural gas in India, which is the key cost component in the delivered price, leads to uncertainty of demand and affects competition within the sector.

- During 2015/16, under the gas-based power generation capacity revival scheme, an estimated subsidy of Rs300 crore was disbursed for stressed/stranded gas-based power plants in Gujarat; which is almost Rs1.5 subsidy for the unit generation from gas-based power plants.

- In the coal sector, major indirect tax components are clean energy cess and royalty, which accounted for nearly 65% of the total indirect tax collection during 2015/16.

- There exist a lot of questions regarding the rationale of implicit subsidy for coal, especially for power generation. To address that, further study is required to determine the options to reform coal subsidies and taxation and their distortionary impacts on the different sections of society.

Chapter 1

Introduction

Historically, energy prices play a major role in the emerging macroeconomic scene and these have driven energy pricing policies in developed and developing countries. Access to affordable and clean energy is crucial for human survival, welfare, and economic development. While all sections of society require energy for their welfare, the management of energy production and pricing is to be based on three building blocks: basic needs, economic growth, and conservation.

In India, the intervention of government in the functioning of market economies to influence the process of resource allocation with policy tools, such as subsidy allocation and tax exemption, remains a matter of debate on political economy. The intention is to achieve socio-economic goals, such as eradication of energy poverty, fair distribution of natural resources to meet demand, and protection of price competitiveness of domestic firms.

However, certain products are demanded both for direct consumption and indirect use (feedstocks). In addition to income, the major determinants of demand are prices of both energy- producing and energy-consuming sectors (non-energy purpose). If energy prices go up, direct consumption is expected to go down. For non-energy purposes, the increase in feedstock cost will ultimately be passed on to the consumers in the form of higher prices for the end product and, thus, the demand will reduce. Also, when energy prices increase, government's tax revenue is expected to increase in nominal terms, but on account of expenditure, the government has to pay more since the subsidy allocation will increase. So, in the backdrop of volatile international oil prices, subsidies should be designed and targeted rationally so that the consumption behaviour of end users remains unaffected; thus, the socio-economic development of the country is not impaired.

In the past, the burgeoning demand of non-renewable energy resources increased energy subsidy bill of the government, which also attracted global attention. However, in a developing country like India, the context of subsidy must be kept in mind as it is quite different from that of developed countries. Considering India's growing energy security concerns coupled with the increased efforts to enhance energy access, shifting to cleaner fuels, amongst other things, to impart the health benefits and to address climate change concerns, there is a need to understand the significance of subsidy for the overall welfare of economy.

The existence of certain subsidies causes fiscal strain on the exchequer and has also led to macroeconomic issues, such as crowding out of private investment in the respective energy sectors and inadequate allocation to social spending. For instance, in the coal-based thermal power plants for electricity generation, the subsidies can also hinder investments required at

the upper end of the value chain. Hence, the production of better washed coal will be impacted due to lack of investments which, in turn, could reduce the boiler efficiency and the quality of electricity generation. Moreover, if the coal is not washed, its transport cost to the thermal power plant goes up, which impacts the cost of power generation; this, in turn, impacts the consumers through higher price. The cost needs to be passed on to the consumers, failing which the revenue flow in the value chain is impacted. Therefore, it is important to understand the nature and extent of subsidies across the different fossil-fuel types and their value chains.

With this context setting the background on energy pricing, the succeeding sections of the report provide analysis of oil, gas, and coal subsidies and pricing. Section 2 chronicles the history of energy pricing related to oil and gas across the segments covered under the study, namely, crude oil, natural gas, LPG, and kerosene, followed by coal (power generation). Section 3 introduces the taxes and subsidies in the regime before the imposition of the goods and services tax (GST). Sections 4 presents an overview of each segment, and the subsequent section presents the analysis of taxes and subsidies across the segments covered under the study, including value chain diagrams for each segment. The value chain diagram also gives an image of supply chain, representing the product, producer, and consumer taxes, and subsidy inflow and outflow from/to central and state governments. The last section concludes.

Chapter 2

History of Energy Pricing and Reforms in India

This section presents a brief history on the pricing of different energy products such as crude oil, petroleum products – petrol, diesel, LPG, and kerosene – natural gas, and coal. The section elaborates on the different regimes that existed for each segment and the corresponding issues related to that regime which influenced the reframing of the principles of the energy products, a history on the transition from an administered pricing regime to a market-determined regime (for products such as petrol and diesel) as part of the rationalisation of energy prices and the removal of subsidies, the government's appointment of different committees to review pertaining issues in the oil and gas sector, their key suggestions that influenced the subsidy reform to reduce burden on government expenditure.

1.1. Crude Oil

Until the late 1960s, the bulk of crude oil required for energy requirements was being imported in the country. After the discovery of Mumbai High, the crude dependence of the country decreased from 65.7% in 1973–1974 to 18.5% in 1984–1985. Thereafter, the country's dependence on imported crude oil started showing an upward trend, reaching 69.1% in 2001–2002 and about 83.0% in 2015–2016 due to the increased demand, which could not be offset by domestic crude oil production.

Pricing of indigenous crude oil

Before 1981, indigenous crude oil prices were fixed on various considerations like import parity, long-run marginal costs, etc. In 1981, the government revised crude oil pricing considering the concepts of the Oil Price Committee. Until 1992, crude oil prices remained unchanged. However, the cabinet committee observed that due to unremunerative pricing, the Oil and Natural Gas Corporation Ltd (ONGC) and Oil India Ltd (OIL), the two public sector undertakings engaged in the exploration and production of oil and gas, could not generate adequate resources to develop more oil fields and explore new areas. As per the recommendation of the cabinet committee, the prices of indigenous crude oil were set based on cost-plus return of 15% post tax on capital employed. Later, in 1992, 1993, and 1996, the basic price of crude oil produced by the ONGC and OIL was revised. As part of phased dismantling of the administered pricing mechanism or APM, effective from 1 April 1998 for the subsequent 4 years, crude oil producers were paid an increasing percentage of the international free on board (FOB) prices on a year-to-year basis (Table 2.1), subject to a floor price of Rs1,991/MT and ceiling of Rs5,570/MT (Rs6,470/MT for March 2002).

Table 2.1. Revision of International FOB Prices during the Phased Dismantling of the APM

Date of Revision	Percentage of FOB price (%)
1 April 1998	75.0
1 April 1999	77.5
1 April 2000	80.0
1 April 2001	82.5

APM = administered pricing mechanism, FOB = free on board.
Source: Bandyopadhyay (2009).

After the dismantling of the APM, effective on 1 April 2002, the prices of indigenous crude were determined based on the crude oil sales agreement between producers and refineries by benchmarking various indigenous crude oils to equivalent international crude oils. As far as OIL is concerned, its crude oil was benchmarked to Nigerian Bonny Light. However, OIL does not receive the full import parity price (IPP) and instead receives the FOB price of the respective market crude adjusted for gross product worth.[1]

Pricing of imported crude oil

The pricing of imported crude oil is the actual cost incurred by various refineries while importing the same and comprises the FOB cost to India, ocean freight, insurance, ocean loss, customs duty, wharfage, etc.

1.2. Petroleum Products

In 1948, the first attempt to regulate the petroleum product prices was made when the GoI and Burmah Shell agreed on the 'Value Stock Account (VSA)'[2] for government purchases which also became applicable for other customers. In August 1957, the government decided to revisit the VSA and replace it with a new agreement based on actual cost plus a reasonable profit. Thereafter, the government took systematic action to regulate product prices by appointing pricing committees from time to time and sealed the selling prices essentially on the IPP.

[1] The difference in crude oil quality between Bonny Light and OIL is determined based on the product yield and prices on four-cut basis which are (i) LPG cut (propane and butane derived from Saudi Aramco contract price, such as Arab Gulf) up to C4; (ii) naphtha (C5-175) FOB, Singapore; (iii) gas oil 0.5% 'S' FOB, Singapore; (iv) fuel oil 180 CST 2% and low sulphur waxy residue (LSWR) (C 350+) FOB, Singapore as per the memorandum of understanding signed by OIL.

[2] The Value Stock Account (VSA) was a cost-plus formula, based on an import parity formula to which the basic selling prices of all major petroleum products were determined as the sum of free-on-board (FOB) price,[2] ocean freight,[2] insurance,[2] ocean loss, import duty, and other levies and charges, as well as 10% remuneration. The realisation of oil companies under this procedure was restricted to the import parity price of finished goods plus excise duties/local taxes/dealer margins and agreed marketing margins of each refinery. Any realisation in excess of the normal was surrendered to the government

The pricing of petroleum products was brought under the APM, effective July 1975, when it was shifted from import parity principles to cost-plus principles. Under the APM regime, the pricing of petroleum products for the refining and marketing units was based on the retention concept where oil refineries, oil marketing companies (OMCs), and the pipelines were compensated cost and return at 12% post tax on the net worth (in addition to actual cost of borrowings), which helped them grow in a protected environment. During the APM period (from 1975 to March 2002), several oil pool accounts were maintained with the following objectives:

1) ensuring stability in selling price;
2) insulating consumers from international price fluctuations; and
3) subsidising consumer prices of certain sensitive products, such as kerosene, for public distribution and domestic LPG by cross subsidisation from certain products, such as petrol, aviation turbine fuel, etc.

Later, in September 1996, the report submitted by the strategic planning group on the Restructuring of the Indian Oil Industry ('R' Group) headed by Vijay Kelkar, observed that the APM was found to be increasingly unsuitable for the long-term growth and efficiency of the oil industry due to the following key drawbacks:

1) Cost-plus compensation did not provide adequate incentive for cost reduction leading to inefficiencies.
2) An internally competitive petroleum sector is absent.
3) The entry of the private sector could inflate the costs under the cost-plus formula, which consumers would have to bear.
4) There is a wide distortion in Consumer prices on account of subsidies and cross-subsidies.
5) Oil companies are adversely impacted due to the huge deficits in the oil pool accounts as a result of untimely price revisions.

The GoI, in November 1997, abolished the APM in a phased manner over the period 1 May 1998 to 31 March 2002. Accordingly, the IPP was introduced to calculate refinery gate prices of major petroleum products, effective 1 April 1998, for their transfer to Marketing, which was still under the APM, based on the recommendations of the Expert Technical Group. The government also decided to reduce the customs duty of petroleum products in phases over this transition period.

With the dismantling of the APM effective 1 April 2002, the retail selling prices of all products, except PDS kerosene and domestic LPG, were determined according to the market. Under the 'PDS Kerosene and Domestic LPG Subsidy Scheme, 2002', the government subsidised per litre of PDS kerosene and per cylinder of domestic LPG. Hence, the increase in certain cost elements of the consumer price of PDS kerosene and domestic LPG were to be passed on to the consumers. Also, the subsidy was planned to be phased out within 3 years (Kirit Parikh Committee, 2013).

Box 1. PDS Kerosene and Domestic LPG Subsidy Scheme, 2002

Effective 1 April 2002, the Government of India decided to subsidise the sale of PDS kerosene and domestic LPG at specified flat rates for each depot/bottling plant based on the difference between the cost price and the issue price per selling unit. To administer these budgetary subsidies, the government formulated a PDS kerosene and domestic LPG subsidy scheme in 2002. The average subsidy in 2002–2003 on PDS kerosene was Rs2.45 per litre and on domestic LPG, Rs67.75 per cylinder. Under this scheme, such subsidies would be phased out in 3 to 5 years. Accordingly, the flat rates as calculated for 2002–2003 were reduced by one-third of the original rate for the next 2 years. However, the scheme could not be phased out as planned; since then, the approved average subsidy rate for domestic LPG and PDS kerosene has been maintained at the 2004–2005 level (i.e. one-third of the 2002–2003 level), that is, 82 paise per litre for PDS kerosene and Rs22.58/cylinder for domestic LPG.

Source: Kirit Parikh Committee, 2013

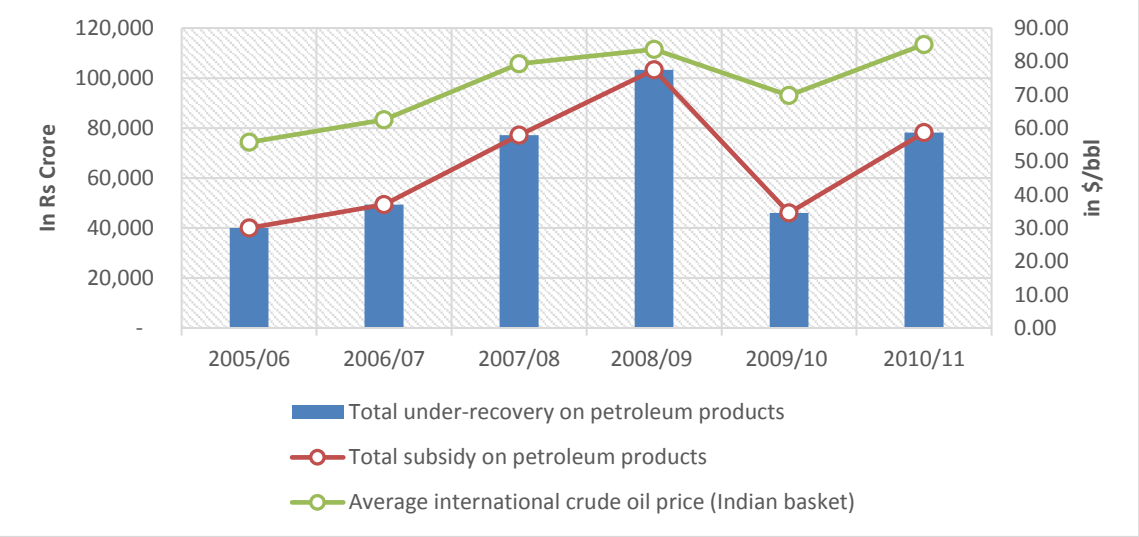
The post-APM pricing mechanism was expected to respond to the changes in the world market prices of crude oil and their impact on the prices of refined petroleum products and accordingly revise the retail selling prices in the country. Between 1 April 2002 and 1 January 2004, the prices of petrol and diesel were revised 23 times, 8 of which were reductions and 15 were increases. However, the retail selling prices of both PDS kerosene and domestic LPG remained virtually unchanged during this period as the government did not permit passing on the increases in cost, and even the reduction in the subsidy amount, to the consumers.

Since 2004, the government has been setting the consumer prices of petrol (decontrolled effective 26 June 2010), diesel, domestic LPG, and PDS kerosene on ad hoc basis to ensure that prices of petroleum products in the country are stable to protect consumers from the volatility in the international oil market. Thus, non-commensurate increases in domestic prices have resulted in significant losses incurred on these products by the OMCs. These OMCs have been partly compensated by the government through the issuance of bonds and provision of cash assistance and partly by public sector undertaking (PSU) upstream companies – i.e. ONGC, OIL, and GAIL India Ltd – through price discounts on crude oil and petroleum products. Thus, the OMCs also absorbed a part of the under-recovery themselves.

However, the continued incurrence of under-recoveries by the OMCs adversely affected their financial and liquidity position. Their rising under-recoveries, coupled with delay in their timely compensation, worsened their cash flows, compelling them to borrow heavily at high interest rates to meet their cash flow and project-funding requirements. This reduction in the cash surplus of PSU upstream companies due to the burden-sharing arrangement restricted their ability to invest in the exploration of domestic fields and in the acquisition of oil assets abroad. Owing to the unprecedented increase in subsidy burden over the years, the endeavours of the upstream companies to grow domestic crude oil production and enhance India's energy security through international oil and gas equity have come under serious threat.

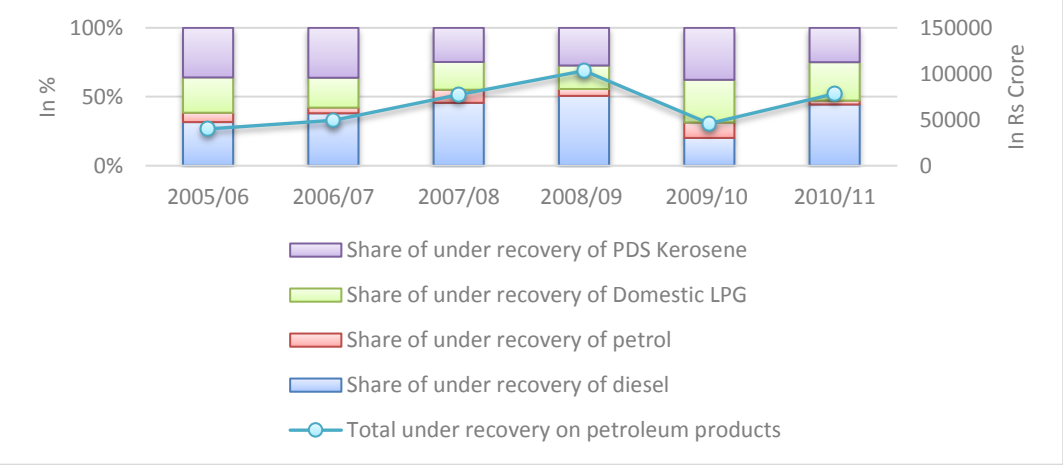
Historically, the government has been the major contributor in the under-recovery burden sharing. In tandem with the increase in under-recoveries over the year, the assistance provided by the government to the OMCs also increased, reaching the highest-ever level of Rs100,000 crore in 2012/13, apart from the planned subsidies. The Report of the Expert Group to Advise on Pricing Methodology of Regulated Petroleum Products concluded that this resulted in widening fiscal deficit and increasing inflation, thus impacting the financial position of the government, leaving less funds to be allocated to the social sector schemes. The historical trend of subsidies and under-recoveries are shown in the Figures 2.1 and 2.2.

Figure 2.2. Trend on Average International Crude Price (Indian Basket) vis-à-vis Total Subsidy and Under-recovery of Petroleum Products



Sources: PPAC (2016a), OGD Platform India (2018).

Figure 3.2. Trend on Total Under-recovery of Petroleum Products and Share of Under-recovery for Domestic LPG, PDS Kerosene, Petrol, and Diesel



Source: PPAC (2018)

In 2004–2010, the government appointed various expert groups to examine the pricing policy of petroleum products and make recommendations for a sustainable pricing policy to ensure the financial health of the oil companies. The various committees that provided recommendations were the Rangarajan Committee (2006), Chaturvedi Committee (2008), and Kirit Parikh Committee (2010).

Rangarajan Committee (2006)

A Committee on Pricing and Taxation of Petroleum Products was appointed under the leadership of C Rangarajan, Chair of the Prime Minister's Economic Advisory Council, in October 2005, to look into the various aspects of pricing and taxation of petroleum products aimed at stabilising/rationalising their prices, keeping in view the financial position of the oil companies, conserving petroleum products, and establishing a transparent mechanism to enable oil companies to autonomously adjust prices. The committee submitted its report in February 2006, with the following major recommendations:

Recommendations related to the pricing of petrol and diesel:

1) Suggested a more appropriate pricing for diesel and petrol (trade parity price [TPP]), which would be a weighted average of the import parity and export parity prices in the ratio of 80:20. The relative weights should be reviewed and updated yearly.
2) The government should keep an arm's-length from actual price determination and allow oil companies the flexibility to fix the retail price under the proposed formula.
3) Reduce the effective protection to refineries by lowering the customs duty on petrol and diesel from 10% to 7.5%.
4) Terminate the principle of freight equalisation. Since the price increase will be larger in remote and hilly areas, the government may want to consider other ways of softening the impact of freight in these areas.

Recommendations related to the pricing of domestic LPG and PDS kerosene:

1) Restrict subsidised kerosene only to families who are below the poverty line families. This will reduce the quantity of PDS kerosene going through the subsidised route by about 40%.
2) Raise the price of domestic LPG by Rs75/cylinder. Beyond this one-time increase, it is necessary to gradually increase the price of domestic LPG so that the retail price adjusts completely to the market level, thus, eliminating the subsidy altogether.
3) Discontinue the practice of asking ONGC/GAIL/OIL to provide upstream assistance, and instead collect their contribution by raising the Oil Industry Development Board (OIDB) cess from the present level of Rs1,800/MT to Rs4,800/MT.
4) The government should meet the entire cost of subsidy from the budget.
5) Suitably amend the 'PDS Kerosene and Domestic LPG Scheme, 2002'.

The committee also recommended implementing the above recommendations as packages and to change the then-present mix of specific and ad valorem levies to pure specific levies. The committee also urged the states to rationalise the sales tax on petroleum products, including irrecoverable taxes.

Chaturvedi Committee (2008)

The government did not increase the retail prices of petrol and diesel until June 2008, despite the continuous increase in international oil prices since June 2006. As a result, the under-recoveries of PSU OMCs reached unsustainable levels in 2008. At that stage, the government appointed the Chaturvedi Committee to look into the financial position of the companies, review the concept of under-recoveries, and examine the available options for burden sharing by all the stakeholders.

The Chaturvedi Committee suggested that the refinery gate prices of petrol, diesel, LPG, and kerosene be based on export parity basis (and not on the TPP). Also, the committee recommended adopting a dual price for diesel, which should be a higher price for industrial and commercial users. The full price adjustments should be made within 9 months for petrol and 24 months for diesel. Once these price adjustments are complete, the government should disengage from the process of pricing petroleum products and allow price to be an outcome of a competitive process.

The committee also reiterated the views of the Rangarajan Committee that subsidies be given only to families who live below the poverty line. Such subsidies should be disbursed through smart cards or cash transfers and not through the supply of products that are well below their market price. The existing subsidies on domestic LPG should be limited to six cylinders per year and eliminated within 3 years.

However, when the oil prices in the international market slumped in the second half of 2008, the magnitude of the under-recovery burden came down significantly and the recommendations were not implemented by the government.

Kirit Parikh Committee (2010)

The finance minister, in his budget speech on 6 July 2009, announced the setting up of an experts' group to advice on a viable and sustainable system of pricing petroleum products. Accordingly, the government constituted an experts' group under the chairmanship of Kirit S Parikh, former member of the Planning Commission, to examine the pricing policy of the four sensitive petroleum products, namely, petrol, diesel, PDS kerosene, and domestic LPG and make recommendations for a viable and sustainable pricing policy for these products. The committee submitted its report on 3 February 2010, with the following main recommendations:

1) Prices of petrol and diesel should be determined by the market, both at the refinery gate and at the retail level.

2) Ensure a transparent and effective distribution system for PDS kerosene and domestic LPG through unique identity number /smart cards framework.

3) Rationalise PDS kerosene allocation across states to bring down the all-India allocation by at least 20%. PDS kerosene allocation can be further reduced based on the progress of rural electrification, LPG, and availability of piped gas, which is expected to reflect a much larger reduction in the next National Sample Survey Organization surveys.

4) Increase the price of PDS kerosene by at least Rs6/litre. Thereafter, the price could be raised every year in keeping with the growth in per capita agricultural gross domestic product (GDP) at nominal price.[3]

5) Increase the prices of domestic LPG by at least Rs100 per cylinder. Thereafter, the price of domestic LPG should be periodically revised based on an increase in paying capacity as reflected in the rising per capita income. The subsidy on domestic LPG should be discontinued for all others, except for households below the poverty line, once an effective targeting system is in place.

6) Continue the extant methodology based on import parity pricing for domestic LPG and PDS kerosene, as long as the country remains a net importer of kerosene and LPG.

7) Establish a mechanism for financing under-recoveries on PDS kerosene and domestic LPG. Until unique identity numbers/smart cards become operational, the following measures must be taken to rationalise pricing and distribution of PDS kerosene and domestic LPG:

   - Periodically reduce PDS kerosene allocation,
   - Increase the prices of PDS kerosene and domestic LPG from time to time,
   - Mop up a portion of the incremental revenue accruing to ONGC/OIL from production in those blocks which were given by the government on nomination basis,
   - Provide cash subsidy from the budget to meet the remaining gap,
   - Fully compensate the OMCs that are marketing PDS kerosene and domestic LPG for their under-recoveries based on this mechanism.

8) Impose additional excise duty on diesel cars/sport utility vehicles. The high excise duty on petrol compared to diesel encourages the use of diesel cars. An additional excise duty on diesel car owners should be levied to collect the same level of tax that petrol car users pay from those who use a diesel vehicle.

9) Mop up incremental incomes of ONGC and OIL—The Ministry of Petroleum and Natural Gas (MoPNG), GoI, should be flexible in mopping up incremental incomes of ONGC and Oil India for the purpose of meeting a part of the under-recoveries of the OMCs on the sale of domestic LPG and PDS kerosene.

[3] The underlying concept seems to be the capacity to pay of the targeted community, which is reflected by the rise in agricultural GDP/capita.

Based on the recommendations of an expert group headed by Kirit Parikh and decision taken by the Empowered Group of Ministers, the retail selling price (RSP) of petrol was market-determined by the government effective on 26 June 2010. Since then, public sector OMCs decide the price of petrol in line with international oil prices and market conditions. Regarding diesel, the government took an 'in principle' decision on 25 June 2010 that its price would be market-determined both at the refinery gate and retail levels. However, the government continued to control the price of diesel in view of high international prices. There were only three increases in the basic price of diesel from 26 June 2010 to 17 January 2013. The government also increased the RSP of PDS kerosene by Rs3 /litre and of domestic LPG by Rs35/ cylinder effective 26 June 2010.

Subsequently, the government has taken various steps to reduce the under-recovery of the OMCs and the consequential reduction in burden on the government to compensate these under-recoveries:

1) Petrol: The price of petrol was already deregulated and made market determined since 26 June 2010
2) Diesel: The OMCs authorised to increase the price of diesel by 40–50 paisa/litre per month effective 18 January 2013. The OMCs were also allowed to sell diesel to bulk consumers at the non-subsidised market-determined price effective 18 January 2013. Therefore, no under-recovery is incurred on the sale of diesel to bulk consumers presently.
3) Domestic LPG: Effective 14 September 2012, the government decided to restrict the supply to six subsidised domestic LPG cylinders to each consumer (of 14.2 kg) per year. On 17 January 2013, the cap on subsidised domestic LPG cylinders was revised from six to nine cylinders annually due to public demand. Thereafter, in 2014–2015, it was increased to 12 cylinders per year.
4) PDS kerosene: As a result of continuous reduction in the annual quota of PDS kerosene, the consumption of kerosene has come down gradually. Also, the central government started incentivising the states for their reduced uptake.
5) Direct benefit transfer: In the case of domestic LPG, direct benefit transfer had been implemented throughout the country by 2015. Efforts are on for direct transfer of benefit to PDS kerosene in a phased manner.

1.3. Natural Gas

The evolution of natural gas pricing took place through multiple regimes. Before 2014, the following two parallel mechanisms – administered pricing mechanism (APM) and non-APM – were used to price natural gas.

The APM continued to be applied to natural gas produced from the nominated block which the government awarded to public sector oil exploration and production companies (ONGC and OIL). Non-APM was applied to natural gas produced domestically from joint venture fields. The following paragraphs detail the various regimes for the pricing of natural gas in the country.

The APM blocks were allotted to national oil companies (NOCs) on a nomination basis under the tax royalty regime and the gas produced from these blocks was priced by the government (controlled pricing). This gas is supplied predominantly to fertiliser plants, power plants, and customers with a requirement of less than 50,000 standard cubic metres per day at rates determined by the government. However, from 1 June 2010, the government fixed APM gas price in the country at US$4.2/MMBTU(inclusive of royalty), except in the northeast where the APM price was US$ 2.52/MMBTU (60% of the APM price elsewhere). The balance of 40% is paid to the NOCs as subsidy from the government budget (MoPNG, 2014a).

Pre-New Exploration Licensing Policy (NELP) gas

Under these production-sharing contracts (PSC) Panna–Mukta, Tapti and Ravva, the entire gas produced must be sold to a nominee of the GoI (GAIL), as per the price formula specified in the PSC. For Panna-Mukta and Tapti PSCs, the price formula for gas is linked to an internationally traded fuel oil basket, with a specified floor and ceiling price of US$ 2.11/MMBTU and US$ 3.11/MMBTU, respectively. These PSCs further included the provision to revise the ceiling price after 7 years from the date of first supply. With this revision, the revised ceiling price in the case of Panna–Mukta gas is US$ 5.73/MMBTU and in the case of Tapti, it is US$5.57/MMBTU. The present price of the Ravva field is US$ 3.5/MMBTU and that of Ravva satellite is US$ 4.3/MMBTU.

New NELP

Under the NELP regime, the gas pricing was formally approved only in the case of the KG basin discovery of Reliance Industries Ltd (RIL). According to the price formula submitted by RIL, the price was benchmarked to international crude price, with a floor and a ceiling price and with a constant factor 'C' to take care of bidding. The price formula proposed was:

SP (Rs/MMBTU) = 112.5*K + (CP-25)^0.15*ER + C

Where

- *SP* is the sale price of gas in Rs/MMBTU
- *CP* is the annual average Brent crude price for the previous financial year, with a cap of US$65/bbl and a floor of US$25/bbl
- *ER* is the average US$/Rs exchange rate for the previous financial year
- *C* is the premium quoted by the customer

The above price proposal was initially considered by the Economic Advisory Council to the Prime Minister, chaired by Dr Rangarajan, which examined the pricing formula and made important recommendations. The government also constituted a Committee of Secretaries, under the Cabinet Secretary, to consider gas supply and pricing issues and recommended that the government may consider framing a gas pricing and gas utilisation policy before considering the price proposal. Finally, on 13 August 2007, the matter was considered by an Empowered Group of Ministers to examine and decide on issues relating to gas pricing and commercial utilisation of gas under NELP.

The price formula approved by the Empowered Group of Ministers was

SP (US$/MMBTU) = 2.5 + (CP-25) ^0.15

Where

SP is the sales price in US$/MMBTU (on Net Heating Value/NHV basis) at the delivery point at Kakinada

CP is fixed for each contract year and is based on the crude price for the preceding financial year

In December 2012, the Rangarajan Committee submitted its report on 'Production Sharing Contract (PSC) Mechanism in Petroleum Industry' and made the following recommendations:

- As competitive domestic price for gas does not exist and may not be expected to come about for many more years, the pricing policy will have to be based on searching out from global trade transactions of gas.
- Combine two methods of search for such prices as the global market is not fully integrated in terms of physical flows and is also not liquid enough everywhere.
- Gas pricing formula shall apply uniformly to all sectors while allocation of gas will be as per the prevailing gas utilisation policy of the government. The proposed formula is given as follows:

Netback price, N = A-B-C

P1AV= (N1 * V1 + N2 * V2+….) / (V1 + V2 + V3+…..)

Where

A = imported LNG price on netback FOB

B = liquefaction costs at the respective loading port

C = transportation and treatment cost of natural gas from well head to liquefaction plant

P1AV = average producers' netback price for Indian imports for trailing 12 months

N1, N2..... are producers' netback price

V1, V2 …… are the volumes corresponding to N1, N2, etc.

V1, V2, V3 and *A* shall be for trailing 12-month period

Prices and volumes shall be for trailing 12 months and P1AV would be arrived for every month.

PWAV= (A1* PHH + A2*PNBP + A3*PJAV)/ (A1 + A2 + A3)

Where

PWAV = Weighted average price to producers in the global markets

A1 = Total volume consumed in North America at average Henry Hub prices on yearly basis

PHH = Annual average of daily prices on Henry Hub for the relevant year

A2 = Volume consumed through various hubs in Europe/Eurasia in the relevant year (entire consumption of Europe and the Former Soviet Union)

PNBP = Annual average of daily prices on National Balancing Point (NBP) in the United Kingdom for the relevant year

PJAV = Yearly weighted average producers netback price of gas in Japan for the relevant year (weighted by the total volume of long-term and spot imports)

PJAV shall also be calculated as P1AV is calculated.

PAV = (P1AV+ PWAV)/2

PAV = Simple average of producer's netback price for Indian imports and weighted average price to producers in the global markets.

The selling price comes to US$4.2/MMBTU for crude price greater than or equal to US$60/barrel (bbl). This is equivalent to Rs,7500/MSCM at an exchange rate of US$1 = Rs45 (MoPNG, 2014).

In October 2014, the GoI notify of the New Domestic Natural Gas Pricing Guidelines. Under these guidelines, a transparent new gas pricing formula linked to global markets came into effect on 1 November 2014 (MoPNG, 2014b). These new guidelines came up with few replacements. The wellhead pricing formula is

P = (VHH PHH + VAC PAC + VNBP PNBP + VR PR)/ (VHH + VAC + VNBP + VR)

Where

VHH = Total annual volume of natural gas consumed in the USA and Mexico

VAC = Total annual volume of natural gas consumed in Canada

VNBP = Total annual volume of natural gas consumed in the European Union and countries of the Former Soviet Union , excluding Russia

VR = Total annual volume of natural gas consumed in Russia

PHH and PNBP are the annual average of daily prices at Henry Hub and National Balancing Point (NBP), respectively, less the transportation and treatment charges.

PAC and PR are the annual average of monthly prices at Alberta Hub and Russia, respectively, less transportation and treatment charges.

The wellhead price for three different hubs and Russia would be determined by deducting US$0.5/MMBTU towards transportation and treatment charges from each of the three hub prices and Russian prices. However, these gas prices are not applicable to the sale of gas produced from certain fields since:

- Prices have been fixed contractually for a certain period of time until the end of such period.
- The concerned PSC provides for a specific formula for natural gas price indexation/ fixation and to such pre-NELP blocks which do not require government approval of formula/basis for gas prices.

The price shall be determined every 6 months based on the aforementioned formula with respect to these guidelines, where the calculation would consider the price and volume data on the trailing four quarter data with one quarter lag. For instance, the price determined for 1 May 2015–30 September 2015 would be based on the said prices prevalent between 1 January 2014 and 31 December 2014.

Non-APM gas from nominated fields

Under the mechanism, the national oil companies (NOCs), such as the ONGC and OIL, are free to charge a market-determined price for the gas produced from new fields in their existing nominated blocks. The government has also issued a pricing schedule and guidelines for commercial utilisation of non-APM gas produced by NOCs from the identified four zones for such new fields from their nominated blocks. Further, to produce non-APM gas from offshore fields, a premium of US$0.25/MMBTU was provided as high investment is required for the development and production from offshore fields.

Later, in 2016, the government introduced certain regulatory changes in the hydrocarbon sector through a new Hydrocarbon Exploration and Licensing Policy.

Pricing of imported LNG

The imported LNG sourced from the international markets can be divided into three categories –long term, medium–short term, and on-the-spot basis. The price of imported LNG is decontrolled by the government. The price for regasified LNG based on long-term, medium-term, and short-term contracts is based on the formula agreed between the buyer and the seller, whereas for the spot LNG, price is based on the global demand–supply position.

1.4. Coal

Until 21 March 1996, the price of coal produced and sold by the Coal India Ltd (CIL) and its subsidiaries was under the complete ambit of the government; thereafter, the prices were partially regulated until December 1999. Coal pricing was formulated by the Bureau of Industrial Cost and Pricing and revisions were notified from time to time by the Ministry of Coal. The decontrol of coal pricing was initiated in phases as per the provisions of the Colliery Control Order 1945. All grades of coking, semi-coking, and non-coking coal under different categories were decontrolled (Table 2.2). The prices of non-coking coal of E, F, and G grades were partially decontrolled and were not to exceed the price as per the norms of the Bureau of Industrial Costs and Pricing.

Table 2.2. Coal Price Deregulation in India

Effective Date	Category of Coal Price Deregulated
22 March 1996	• Non-coking grades: A, B, and C • Coking coal and semi/weak coking coal
12 March 1997	• Non-coking grades: D • Non-coking grades: E, F, and G (partial decontrol) • Hard coke and soft coke • CIL allowed to revise price of non-coking coal every 6 months
1 January 2000	• CIL free to decide the price of coal

CIL = Coal India Ltd.
Source: Author's compilation.

Some factors responsible for the deregulation of coal price include reduction in imported coal price on account of reduced import duties from 85% in 1993 to 25%–20% in 1999–2000 leading to a priced-out situation for domestic coal. Complete deregulation of coal pricing came into effect in 1 January 2000, with the government's notification of the new Colliery Control Order 2000 (now Colliery Control Rules 2004); coal companies themselves could decide on determining the coal price. After the introduction of the New Coal Distribution Policy in 2007, the coal ministry issued guidelines for the supply of coal on cost-plus basis. The guidelines factored in the cost of production and a reasonable rate of return on investments.

CIL's prime objective for pricing coal is to provide coal at a price that covers both the fixed and variable costs, including current and future investments within general inflation levels guided by market dynamics. Through its pricing, CIL also ensured that the landed cost of domestic coal at different consuming points remains competitive vis-à-vis the landed cost of imported coal at the same place. The price of different grades of non-coking coal imported from Indonesia has been used as a yardstick for import parity pricing of comparable non-coking coal at pithead under the gross calorific value (GCV) pricing regime after extending discount provisions of 25%–77% for consumers in the regulated sector and 25%–62% for other sectors.

GCV Pricing Mechanism

Coal companies adopted a new pricing mechanism for non-coking coal based on GCV[4] in line with the international pricing of coal moving away from hitherto adopted useful heat value (UHV)[5] system to help address the issues of inferior quality supply of coal; this came into effect from January 2012. For the base price determination of coal, a weighted average price (WAP)

[4] Gross calorific value (GCV) assumes that the latent produced during combustion is condensed and can be recovered. In other words, GCV is computed from the heat value released by coaly matter present in coal and, therefore, can be ascertained for all varieties of coal, irrespective of high ash and high moisture or low ash and low moisture.

[5] Useful heat value (UHV) assumes that all latent heat produced during combustion leave uncondensed and cannot be recovered. In other words, the UHV is computed by applying penalties on ash and moisture to the heat value of the coaly matter and cannot be determined analytically.

is calculated for all open cast and underground mines together with addition of other cost elements, such as working capital and term loan interest and post-tax return on equity. To achieve uniformity of prices for the different mines of coal companies, the norms of the Bureau of Industrial Coat and Pricing – such as normative levels of production, stripping ratio, annual capacity, interest, requirement for working capital, etc. – were prescribed to ultimately determine the coal price. The prices were then fixed separately as per the coal grades and classes of mines.

The UHV system classified non-coking coal into seven grades after discounting ash and moisture content. In the case of pricing under the UHV classification, the price for the same grade of coal in different subsidiaries of CIL and even within the same subsidiary used to be different. According to the empirical formula for UHV, coal with 55% ash plus moisture is considered ungraded, and coal with 65% and above ash plus moisture presence would be of negative heat value.

Under the GCV pricing system, the bands are narrower and classified into 17 bands of 300 kcal/kg ranging between 2,200 kcal/kg and 7,000 kcal/kg (Table 2.2) and have, therefore, closely similar qualities. This pricing method attempts to determine a uniform price for all types of coal unlike in the case of pricing under the UHV classification as mentioned earlier. Coal pricing under the GCV-based system attempts to attain overall revenue neutrality. Therefore, coal that used to be offered under the UHV grading with a wide bandwidth of 600–1,100 kcal/kg has been reclassified in such a manner that its average price remains the same under the GCV grading system. However, switching to GCV grade does facilitate the setting of higher benchmarks for energy content calculation in coal as it will not only focus on ash and moisture, as in the UHV grading system, but will also emphasise content of highly combustible elements, such as carbon, nitrogen, oxygen, hydrogen, and sulphur.

The prices tabulated in Table 2.3 are the pithead prices at the respective coal mines of CIL and Singareni Collieries Company Ltd (SCCL), determined by the companies based on the cost of production, investment, and pricing norms. The price of coal grades G1–G5 is at import parity while the price from G6 onwards is fixed at less than international levels in the case of CIL. In comparison, SCCL prices for coal are higher than CIL from G3 onwards for both the regulated and the non-regulated consumer sectors.

Table 2.3. Notified Grade-wise Base Rate of Coal of CIL in 2013 (applicable in 2015/16)

Grade	GCV Range	Pithead Run of Mine Price for Non-coking Coal	
		Power Utilities (including Independent Power Producers (IPPs), Fertiliser, and Defence Sectors	Sectors other than Power Utilities (including IPPs), Fertiliser and Defence Sectors
	(kcal/kg)	(Rs/ton)	(Rs/ton)
G1	Exceeding 7,000	*	*
G2	Exceeding 6,700 but not 7,000	4,870	4,870
G3	Exceeding 6,400 but not 6,700	3,890	3,890
G4	Exceeding 6,100 but not 6,400	3,490	3,490
G5	Exceeding 5,800 but not 6,100	2,800	2,800
G6	Exceeding 5,500 but not 5,800	1,600	2,150
G7	Exceeding 5,200 but not 5,500	1,400	1,890
G8	Exceeding 4,900 but not 5,200	1,250	1,690
G9	Exceeding 4,600 but not 4,900	970	1,310
G10	Exceeding 4,300 but not 4,600	860	1,160
G11	Exceeding 4,000 but not 4,300	700	950
G12	Exceeding 3,700 but not 4,000	660	890
G13	Exceeding 3,400 but not 3,700	610	820
G14	Exceeding 3,100 but not 3,400	550	740
G15	Exceeding 2,800 but not 3,100	510	680
G16	Exceeding 2,500 but not 2,800	450	610
G17	Exceeding 2,200 but not 2,500	400	540

* For gross calorific value (GCV) exceeding 7,000 kcal/kg, the price shall be increased by Rs150/ton over and above the price applicable for GCV exceeding 6,700 but not exceeding 7,000 kcal/kg, for increase in GCV by every 100 kcal/kg or part thereof.

Source: CCAI (2013).

The price of coal has undergone eight general revisions since its deregulation, with the latest being on 30 May 2016 which was the GCV-based price revision, linking the price of coal to its actual calorific value or quality. Coal officials cited that the price revision was undertaken only when there was a need to make up for the appreciation in input cost and there was no set time frame for which coal prices were revised. The GCV-based coal price has been determined

based on the WAP of the former UHV grade, at the same time maintaining the neutrality of the overall revenue.

To address the balance between conflicting interests of coal companies and end users, the end users have been bifurcated into two groups bringing the concept of dual pricing–consumers in the (i) regulated sector, which include the power stations, defence, and fertiliser sectors; and (ii) consumers in the non-regulated sectors, such as cement, rubber, sponge iron, etc. Coal price in the non-regulated sector is 30% higher than that in the regulated sector other than Grades A and B as the prices of end products in the non-regulated sector are determined by demand–supply dynamics and market forces. Prices for Grades A and B coal were fixed on import parity basis (import price at nearest port minus 15%) for supply to all coal-consuming sectors.

Summing up, the government has taken several steps to deregulate the key sensitive petroleum product segments by gradually increasing the prices to market-determined prices and thereby reduce the subsidies allocated in the oil and gas sector. The same efforts have been taken in the domestic LPG and PDS kerosene segments. In the natural gas sector, multiple pricing methodologies exist to determine prices, and cheap domestic gas is allocated based on the natural gas allocation policy. In the case of coal, the power sector remains regulated, and non-coking coal is priced discriminatively between the regulated and deregulated sectors.

Chapter 3

Overview of Segments

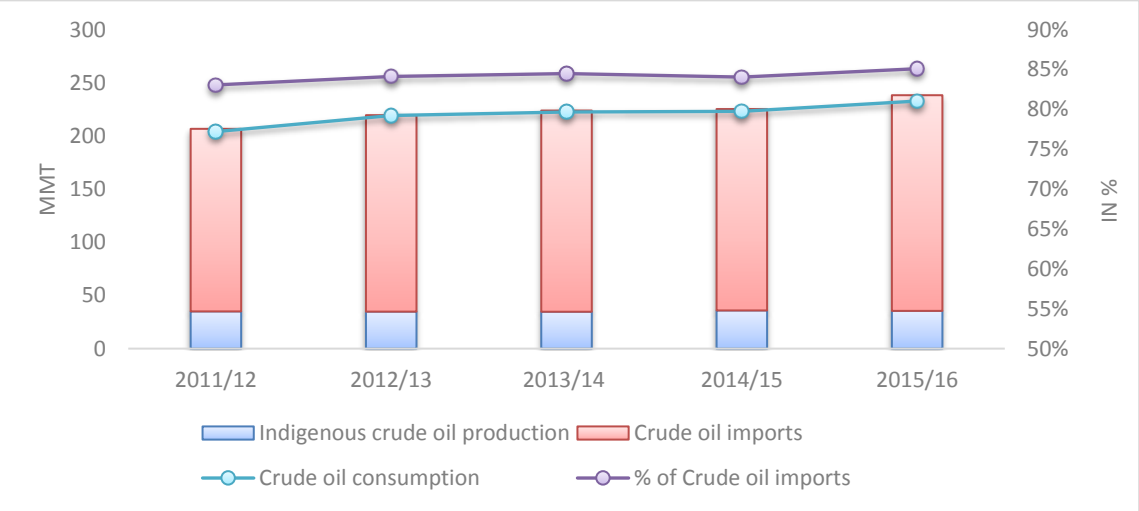
1.1. Crude Oil

India is the world's fourth-largest energy consumer with crude oil accounting 29% of the total primary energy consumption in 2015/16. The country has 0.5% of the oil and gas resources of the world and 15% of the world's population. The high economic growth in the past few years and the increasing industrialisation coupled with burgeoning population have created huge concerns in India's energy security scenario (India Chamber of Commerce, 2018).

Over the past 20 years, the domestic production of crude oil has not increased significantly (Figure 3.1) and remained at a plateau until 2015/16. On the other hand, the demand of crude oil grew at a compound annual growth rate (CAGR) of 5% between 2011/12 and 2015/16 (Figure 3.1). This makes the country more dependent on the import of crude oil, also evident from an increase in crude oil imports from 83% in 2011/12 to 85% in 2015/16.

Majority of inland crude oil transportation is through coastal shipping to the refineries located at the coastal areas and through dedicated pipelines, owned and operated either by the consumers (refiners/oil companies) or producers (ONGC/OIL). Railway wagons (Class 145) are also used to transport crude in very special situations where the freight charges were notified by the railways from time to time based on distance.

Figure 4.1. Trend in Indigenous Crude Oil Production, Imports, Consumption, and Share of Imports in Total Supply



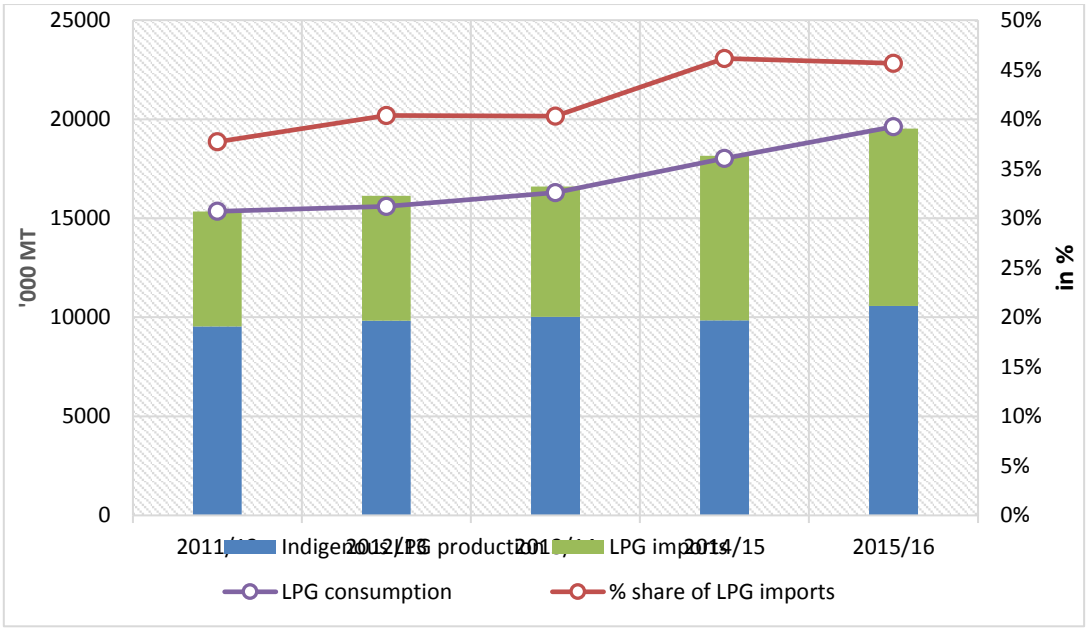
Source: MoPNG (2016a).

1.2. Liquefied Petroleum Gas (LPG)

LPG is a light distillate obtained from crude oil and from the processing of natural gas. The Indian LPG story has been an exemplary case of making clean cooking fuel available, accessible, and affordable to all classes of people, thereby preventing indoor air pollution, arresting deforestation, and mitigating greenhouse gas emissions.

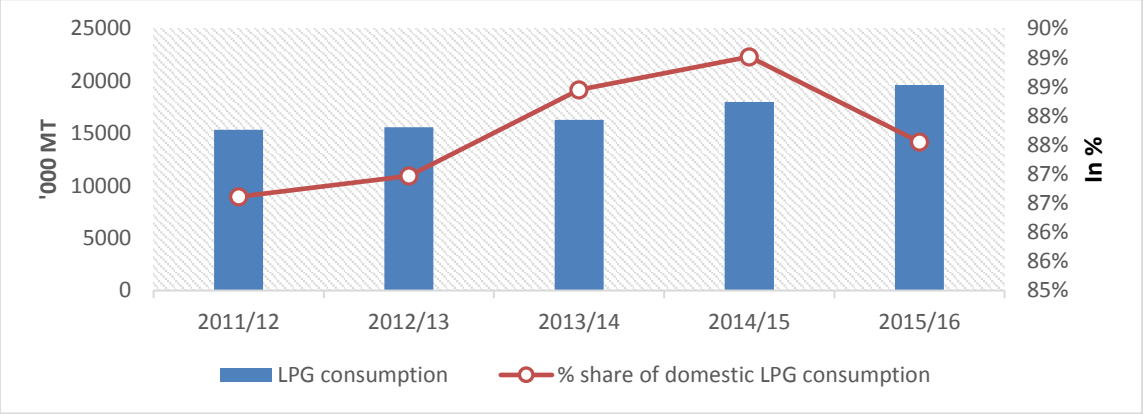
LPG consumption in India has more than doubled in the 2000s, especially for domestic purposes. Supported by a massive transformation in rural penetration of LPG, LPG recorded a CAGR of 4% between 2011/12 and 2015/16 (Figure 3.2). The stakeholder meetings revealed that, out of the total LPG consumption, domestic LPG accounted for 88%, that is, 17.2 MMT; within that, subsidised LPG accounted for about 88% in 2015/2016 (Figure 3.3). The sector-wise consumption of LPG is shown in Figure 3.4. On the other hand, the indigenous production of LPG remained at the same level during 2011/12 to 2015/16, leaving the rest of the LPG demand to be met through imports. During 2012/13 to 2015/16, the share of LPG imports grew by 8%.

Figure 3.2. Trend in LPG Marketing in India



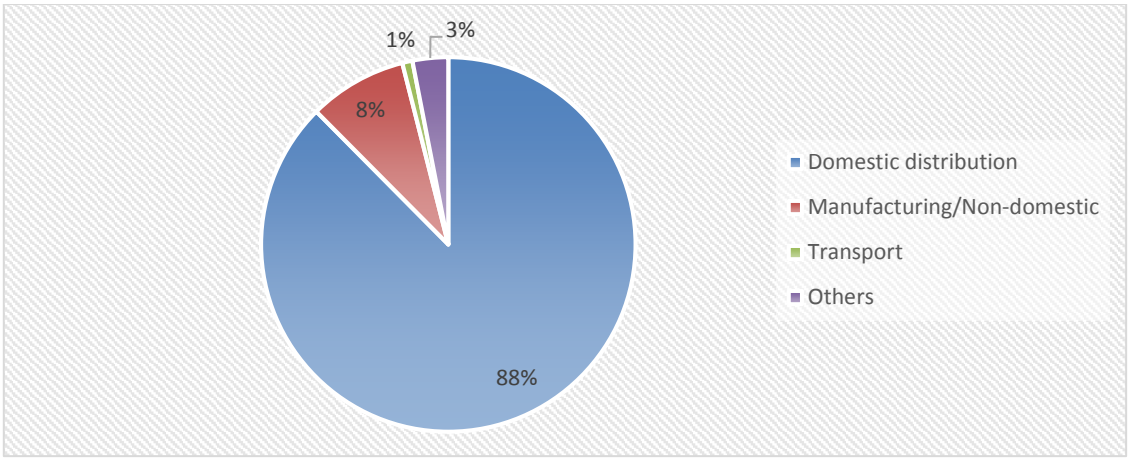
Source: MoPNG (2016a).

Figure 3.3. Trend in the Share of Domestic LPG in Total Consumption



Source: MoPNG (2016a).

Figure 3.4. Sector-wise Consumption of LPG in 2015/16



Source: MOSPI (2017).

In India, domestic LPG is primarily marketed by the three public sector OMCs: Indian Oil Corporation Ltd (IOCL), Bharat Petroleum Corporation Ltd, and Hindustan Petroleum Corporation Ltd. The private refineries are mandated to sell the LPG they produce to public sector OMCs according to their requirement before the LPG is exported. Domestic LPG is largely supplied in 14.2 kg cylinders and is sold both at subsidised and commercial rates. Direct purchase of LPG cylinders requires possession of a registered LPG connection at an LPG distributorship, which is run by the OMCs. LPG distributors are weighted more towards urban areas with OMCs reporting urban enrolment accounts' share of more than 50% out of the total connections in 2015/16. Further, there have been efforts to increase the LPG coverage throughout the rural population to improve access to clean energy.

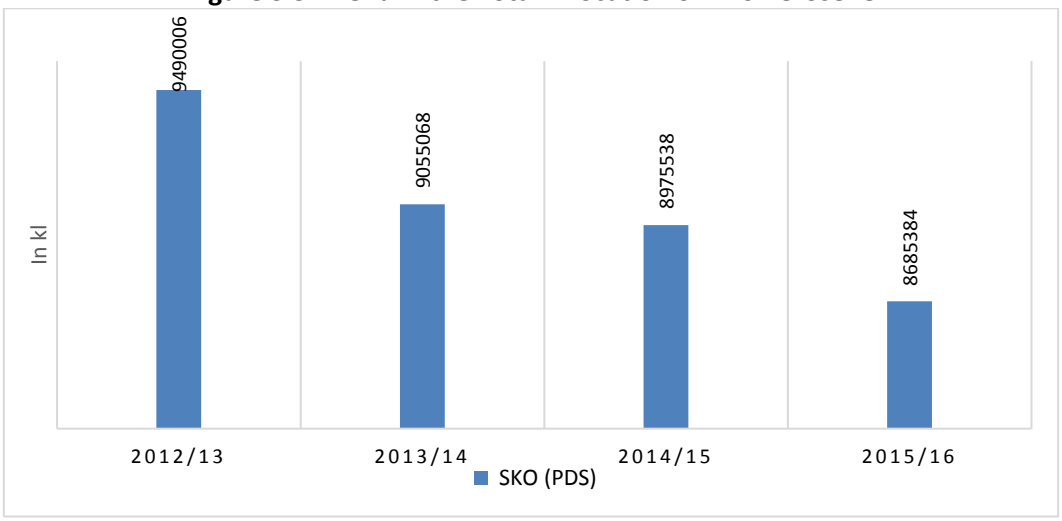
1.3. Kerosene

Kerosene or 'superior kerosene oil' (SKO) is primarily used by households for lighting and cooking, with additional uses for industrial purposes and as fuel for generators, pump sets, freight and passenger vehicles, and agricultural machinery. Over the last 60 years, the

kerosene sold through the public distribution system is used mostly for household purposes and continued as a subsidised commodity (IISD, 2016).

In India, kerosene is a dying fuel as the government is promoting the use of cleaner fuels, such as LPG for cooking and solar lamps and electricity for lighting purposes. Over the past 3 years, the average rate of reduction in the total annual kerosene allocation has increased significantly, with allocations falling by 4.5%, 1.1%, and 3.7% in 2013/14, 2014/15, 2015/16, respectively. In 2015/16, the total allocation of PDS kerosene recorded a decline of 8.5% over the last 3 years, only 8,685,384 KL which was 9,490,006 KL in 2012/13 (Figure 3.5). The sector-wise consumption of kerosene during the period 2015/16 is shown in Figure 3.6.

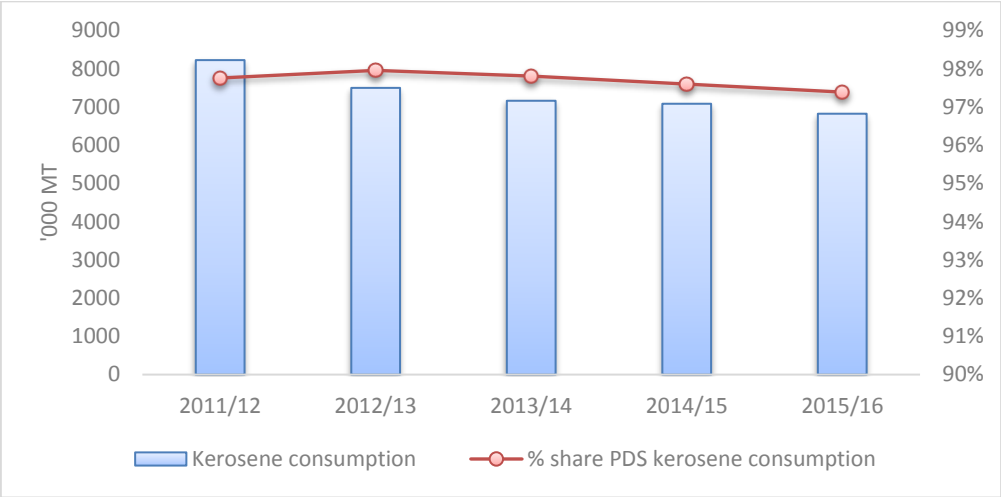
Figure 3.5. Trend in the Total Allocation of PDS Kerosene



PDS = public distribution system, SKO = superior kerosene oil.
Source: MoPNG (2016a).

Subsidised kerosene (domestic purpose), which constitutes the majority of the consumption (Figures 3.6 and 3.7), is provided through the PDS, a nationwide system of predominantly third party–run fair price shops (administered at the state level) through which the central and state governments distribute subsidised food, kerosene, and other commodities based on household ration card allocations. Unlike the other designated 'sensitive' petroleum products subject to price regulation (LPG and previously diesel and petrol), the central government predetermines and allocates a volume of PDS kerosene for consumption for each state. The states' allocation of PDS kerosene is calculated by the MoPNG and released quarterly for delivery. The delivery is in coordination with the Department of Food and Civil Supplies within each state and union territory which is responsible for uplifting the allotted quota and distribution to retailers. The concerned state governments/union territories allocate the quantity of kerosene to individuals through a ration card system.

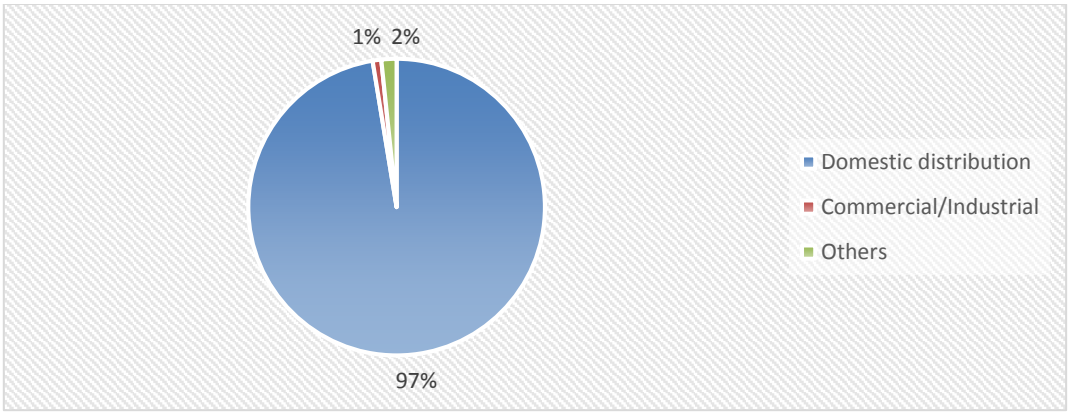
Figure 3.6. Trend in Kerosene Consumption and Share of PDS Kerosene in Total Consumption



Source: MoPNG (2016a).

Also, there is an increased effort by the government to phase out subsidy on kerosene. In line with this, the government also announced the monthly increase in the price of PDS kerosene and to provide financial benefits to states that surrender or reduce their off-take of allocated kerosene. To reduce the leakage and to target the subsidy to the beneficiaries, the government also announced the implementation of the direct benefit transfer for kerosene across India.

Figure 3.7. Sector-wise Consumption of Kerosene (SKO) in 2015/16



SKO = superior kerosene oil.
Source: MOSPI (2017a).

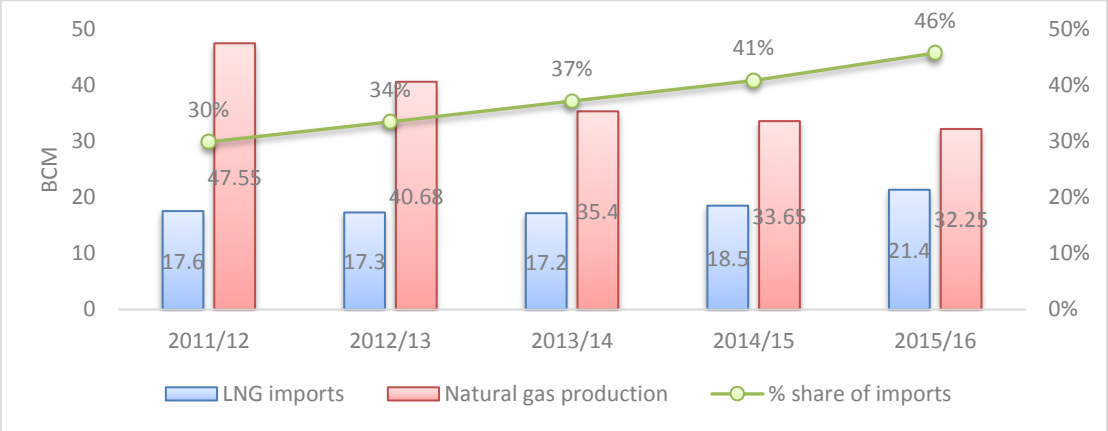
1.4. Natural Gas

In India, natural gas contributed only 6.7% of the total primary energy requirements as of 2015/16 and declined from 11% in 2011/12. The downward trend is mainly due to the reduced production from the existing fields (KG-D6 basin) and lack of new developments. After 2010/11, when the production of natural gas peaked (52.21 BCM), it started declining at a CAGR of 9.2% between 2010/11 and 2014/15, and further dropped to 32.25 BCM in 2015/16 (Figure 3.8). This gradually increased import dependency; now, the shares of domestic natural gas and imports account for nearly equal the total natural gas supply. Out of the domestic gas

production share, production from the offshore region accounts almost 72%. The government has put lots of efforts to enhance production and consumption through the introduction of new policies and implementation of necessary regulatory changes. The power, industry (including refinery), and city gas distribution sectors together contribute around 83% out of the gas consumption for energy. Of the total gas consumption in the country, fertilisers (mainly urea based) and power together accounted for about 60% of the total natural gas supply during 2015/16 (Figure 3.9).

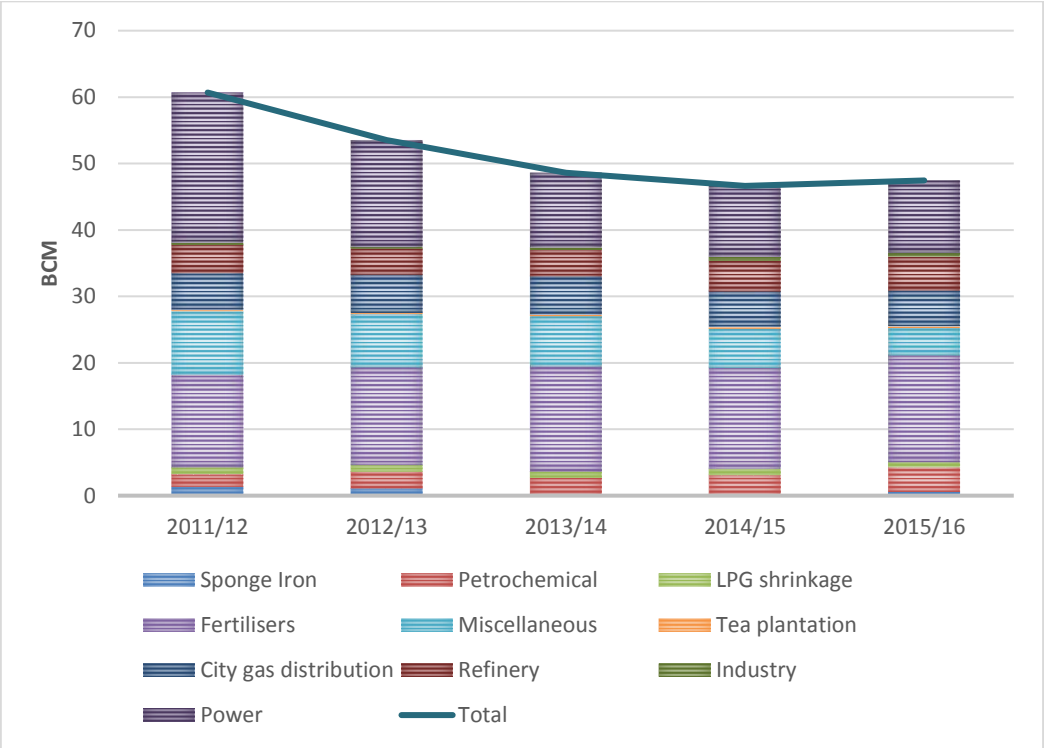
The domestic gas produced from the nominated fields is sold through an agreement between buyers and sellers called 'Gas Sales and Transmission Agreement'. The transmission of natural gas is mainly through the pipelines and the tariff has been set on a zonal basis, which increases according to the distance. GAIL India Ltd, the largest entity in the country, owns and operates about 70% of the pipeline capacity and acts as marketer and transporter of gas to the consumers along with other entities, such as the Gujarat State Petroleum Corporation and Reliance Gas Transportation and Infrastructure Ltd. In the midstream part of gas infrastructure are four regasification terminals located at the west coast of India with an aggregate capacity of 26.5 MMT per year as of 31 March 2016.

Figure 3.8. Trend in Domestic Production of Natural Gas, Imports, and Share of Imports in Total Supply



Source: MoPNG (2016a).

Figure 3.9. Trend in Sector-wise Consumption of Natural Gas (in BCM)



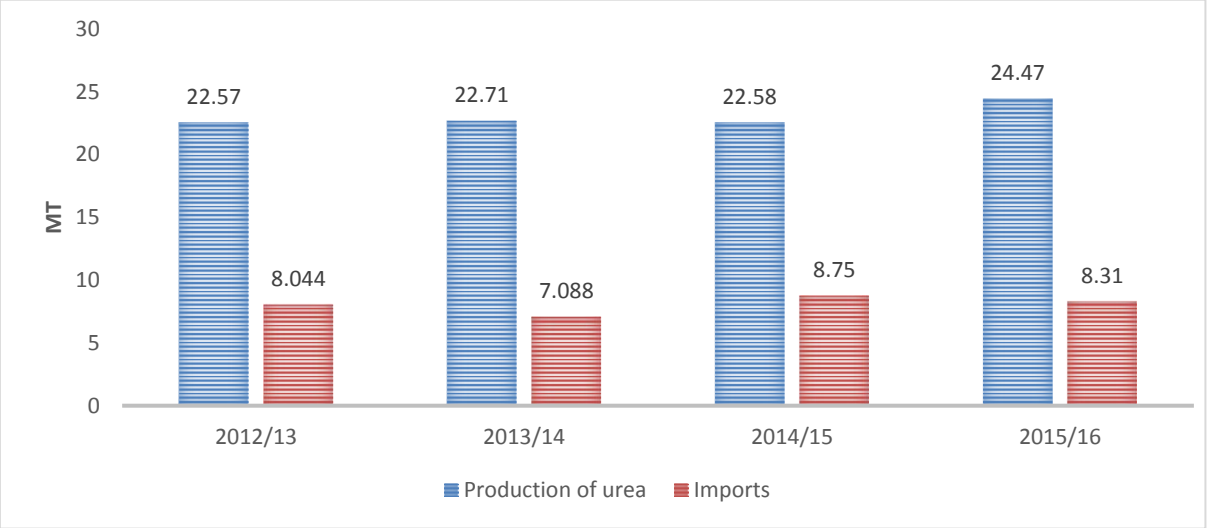
Source: MOSPI (2017).

Fertiliser sector

The fertiliser industry is an allied activity of the agriculture sector. The farming and the ancillary activities contribute to about one-sixth of India's gross domestic product (GDP). Since the agriculture sector is an important sector of the Indian economy, the government has ensured the availability of adequate quantity and quality of fertilisers to farmers. Out of the total fertiliser production in the country, urea dominates with about 60% during 2015/16. India is the world's second-largest consumer of urea, and the government is working towards increasing the domestic production of urea to reduce the imports and attain self-sufficiency by 2022. In 2015/16, urea production in the country was approximately 24.5 MMT (Figure 3.10), leaving a gap of 8.5 MMT with respect to the consumption; the same was met through imports from China, Iran, and Oman.

Due to the support offered by the government towards the growth of the fertiliser industry, there had been a rapid build-up of manufacturing units of urea. As of 31 March 2016, there were 30 large-scale urea-manufacturing plants, 27 of which are gas based and the remaining ones are naphtha based. Natural gas is the preferred feedstock for the fertiliser sector and access to reasonably priced-natural gas is a key concern, given the conversion of the country's urea-manufacturing plants from naphtha to natural gas. Urea is the only 'controlled fertiliser', whose price the government controls. Since 2002, the urea farm gate price is capped at Rs5,360/MT (excluding excise duty for domestic production, countervailing duty for imports (1% during 2015/16), and the sales tax/VAT which differs from state to state). Any variation in the cost of production is absorbed by the government through subsidy.

Figure 3.10. Sector-wise Consumption of Raw Coal in India in 2015/16

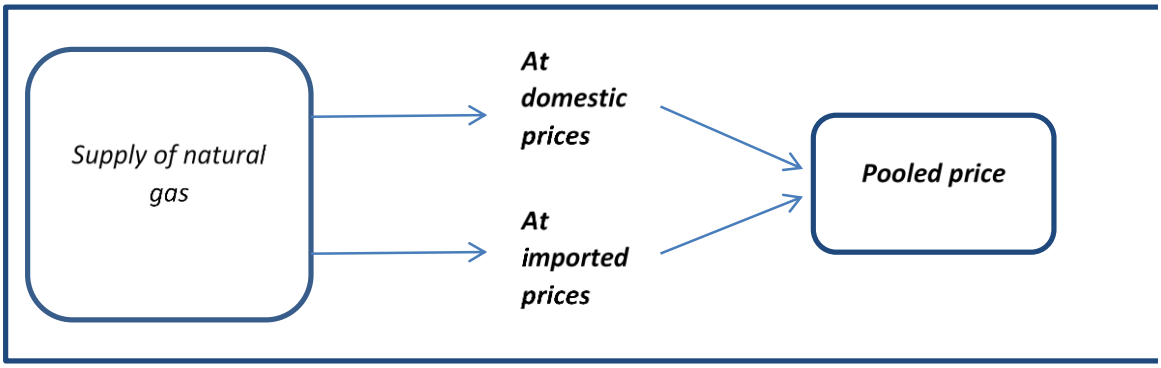


Source: Department of Fertilizers (2016).

After 1 July 2014, with the introduction of the gas pooling policy for urea-based fertilisers, the prices of natural gas required by urea-manufacturing plants became uniform. The fall in natural gas prices during 2014/15 and the introduction of the natural gas pooling policy boosted production of fertilisers and reduced subsidy allocation. In 2015/16, the pooled price of gas for fertiliser companies was assessed as US$8–US$9.

Box 2: Natural Gas Pooling in the Fertiliser Sector

The Cabinet Committee of Economic Affairs approved the pooling of natural gas for the fertiliser sector (urea) effective 1 July 2015 (Cabinet Committee on Economic Affairs, 2015). Under this policy, domestic gas is pooled with regasified LNG (RLNG) to provide natural gas at a uniform delivered price for grid-connected fertiliser plants for the manufacturing of urea (MoPNG, 2015). The pooling, carried out in two phases, is monitored by the Empowered Pool Management Committee (EPMC) comprising senior officers from the Ministry of Petroleum and Natural Gas, Department of Fertilizers, Department of Expenditure, Petroleum Planning and Analysis Cell, Fertiliser Industry Coordination Committee (FICC), and GAIL. GAIL has been designated as the pool operator. The EPMC is responsible for approving plant-wise gas supplies made under the pool mechanism and LNG purchase agreements for medium-term/spot LNG; monitoring optimum utilisation of domestic gas for the pool, as well as monitoring the operator's activities to ensure transparency; and deciding 'the rate of interest FICC shall charge on the amount paid by FICC to Pool Fund Account (PFA) on behalf of a fertiliser plant in case it fails to deposit full/part amount to PFA against debit note within due date'. The operator (GAIL) is responsible for collecting data on anticipated gas supplies to fertiliser units as per the existing contract on a quarterly basis; determining the additional quantity of RLNG required to meet the demand; determine plant-wise and uniform weighted average delivered cost of gas based on the anticipated supply, the additional quantity of RLNG decided by the EPMC, and the information submitted by the FICC; and procure LNG in a transparent manner. The gas price pooling mechanism is shown in the diagram.



Source: Authors' compilation.

Constraints in supply of domestic natural gas to the fertiliser sector

During 2015/16, the total demand of natural gas as feedstock for the urea manufacturing units was placed at 46.5 million metric standard cubic metre per day (MMSCMD), and 31.5 MMSCMD of domestic natural gas was allocated to these plants under the gas allocation policy. Out of the 31.5 MMSCMD allocated, only 26 MMSCMD was supplied because of the decline in production of domestic gas from the KG D6 of Reliance and Panna–Mukta and Tapti, which was a joint venture of British Gas, Reliance, and the ONGC. The major impact was the decline in output of the KG D6 basin, where production dropped from 60 MMSCMD in 2011/12

to 10 MMSCMD in 2015/16. This also impacted other sectors such as power, steel, and petrochemicals Department of Fertilizers (2016).

Gas-based power generation

As of 31 March 2016, India had 24.5 GW of natural gas–based installed power generation capacity of which almost 44% was in the western region. However, the plants were operating at very low plant load factor (PLF) of 0%–40% due to a reduced supply of domestic natural gas. The gas-based power plants were consuming for energy purposes almost 55% of the total natural gas in 2011/12; consumption dropped to 42% in 2015/16. With suboptimal capacity utilisation and supply-side bottlenecks, the present sunk investment in the gas-based power plants of over Rs64,000 crore is endangered of becoming non-performing assets. To revive and improve the utilisation of stressed and stranded power generation capacity, the government introduced a reverse e-bid scheme in 2015/16 along with subsidies (see table).

Box 3. Scheme for the Utilisation of Gas-based Generation Capacity

To revive the gas-based power-generating stations, the government formed an Empowered Pool Management Committee (EPMC). This EPMC scheme envisages supply of imported spot LNG (e-bid LNG) to the stranded gas-based power plants as well as the plants receiving domestic gas up to a target plant load factor (PLF) selected through reverse e-bidding process with the support of the Power System Development Fund (PSDF). The outlay of the support from the PSDF was fixed at Rs3,500 crore for fiscal year (FY) 2015–2016, where Rs500 crore would be kept aside for the plants receiving domestic gas and Rs3,000 crore for the stranded plants to revive up to the targeted PLF of 35%. The eligible gas-based power plants under this scheme were the stranded plants and the plants receiving the domestic gas whose actual average PLF achieved in April–Jan 2014/15 was below the target PLF (which was specified as 25% for the first 5 months of FY2015/16 and 30% for the remaining months of 2015/16 and the complete 2016/17). To achieve the target price of power (i.e. the net purchase price for the distribution companies which is set at Rs5.5/kWh for the stranded gas-based power plants and Rs4.19/kWh for the plants receiving domestic gas for the incremental generation up to the target PLF), the following interventions/sacrifices (see table 5.1) have been approved to be made by the central, state governments, power developers, and gas transporters collectively.

Table: Subsidy by Various Stakeholders under the Gas-based Capacity Revival Scheme

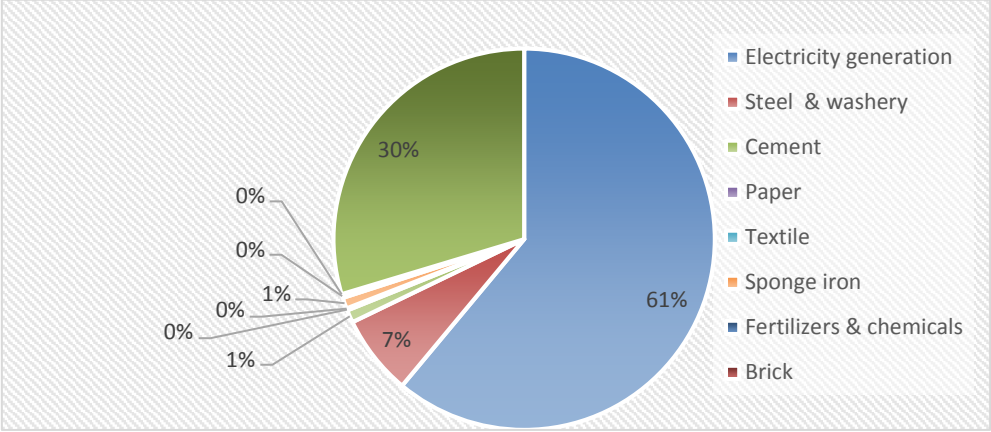
Subsidy	Description
Waiver of customs duty	The Government of India already exempted customs duty on imported LNG used for power generation.
Waiver of value added tax (VAT) on the e-bid RLNG	The concerned state governments are required to waive VAT on the e-bid RLNG consumed in power generation, based on the invoice.
Waiver of central sales tax (CST), octroi, entry tax on the e-bid RLNG	CST, octroi, and entry tax shall be exempted by the concerned states on the e-bid RLNG. Further, in case of the CST on the sale of RLNG, the entry tax being levied by states shall be exempted by the respective states on the e-bid RLNG.
Waiver on service tax on regasification and transportation of the e-bid RLNG	The service tax on regasification and on transportation of e-bid RLNG was waived off, for which the Department of Revenue, Ministry of Finance shall issue appropriate notification.
Reduction in regasification charges by regasification agencies on the e-bid RLNG	The regasification agencies shall reduce the regasification charges by 50% on the e-bid RLNG.
Reduction in pipeline tariff charges by GAIL/transporters on the e-bid RLNG	GAIL/other transporters such as RGTIL and GSPCL shall reduce the pipeline tariff by 50% on e-bid RLNG.
Reduction in marketing margin by GAIL/GSPCL on the e-bid RLNG	The GAIL/GSPCL shall reduce marketing margin by 75% on the sale of e-bid RLNG.

GAIL = Gas Authority of India Ltd, currently GAIL India Ltd; GSPCL = Gujarat State Petroleum Corporation Ltd ; RGTIL = Reliance Gas Transportation and Infrastructure Ltd; RLNG = regasified liquefied natural gas.
Source: MoP (2015).

1.5. Coal

The coal mining and coal-fired thermal power generation sectors are two of the core industries that together contribute approximately 10% to India's Index of Industrial Production, affirming their importance to the economy (CIL, 2018). The coal reserves are concentrated in a few small regions (mainly in the east) while consumers are spread across the country. The major coal fields are in the states, such as Odisha, Jharkhand, Chhattisgarh, West Bengal, and Madhya Pradesh. The power sector remains the key consumer segment contributing almost 60% of the coal demand during 2015/16 (Figure 3.11). The demand for coal has increased one third between 2012 and 2016 (Figure 3.12).

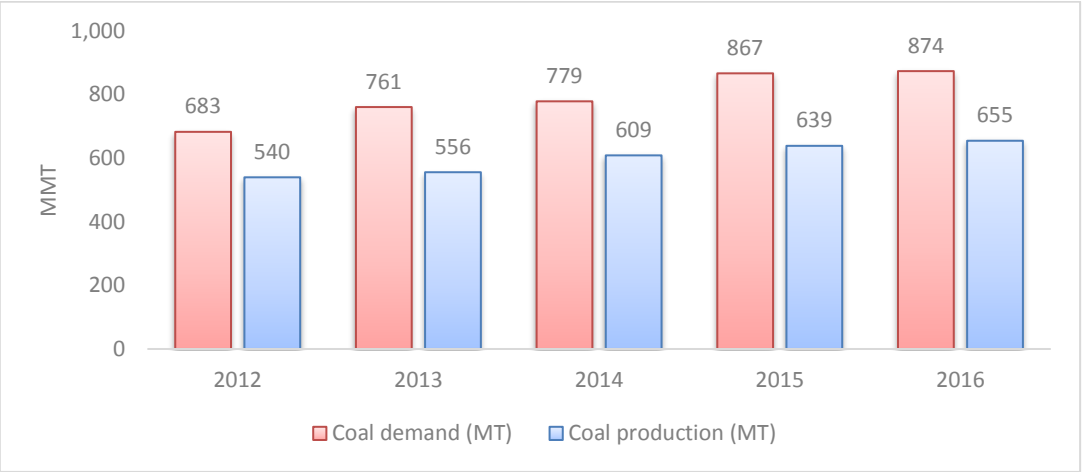
Figure 3.11. Sector-wise Consumption of Raw Coal in India in 2015/16



Source: MOSPI (2017).

Domestic coal production also significantly increased in the same period. CIL remains the largest coal producer in the country followed by the SCCL.

Figure 3.12. Trend in Coal Demand vs Domestic Coal Production



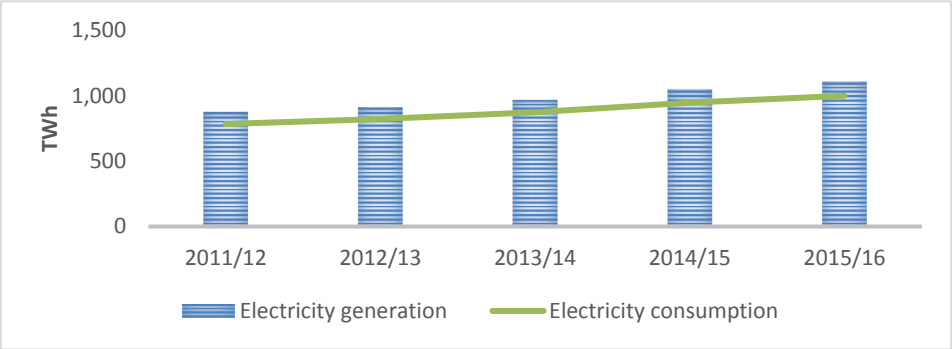
Source: CIL (2018).

One key aspect of coal supply in India is abundance of relatively lower grades of coal. In the case of thermal coal, coal pertaining to the GCV range of 3,400–4,600 kcal/kg (G10–G13) forms about 69% of the overall supply. In India, the cost of coal production is favourable as the estimated average cost of coal production (run of mine coal, excluding crushing, sizing, transportation charges, and all levies, duties, cess) is Rs,1,000 per ton. On the distribution side, coal evacuation is mainly conducted via railways, roadways, merry-go-round and belts, and conveyors and ropeways. The bulk of the coal transport from the pitheads is conducted by the Indian Railways. This study is limited to identifying the taxation of domestic non-coking coal and the imported coal consumed by the power sector, the largest consumer sector, as well as the subsidy incurred in the segment.

Coal-based power generation

Coal is the main and primary fuel source to produce electricity in India. In 2015/16, out of the total installed power generation capacity of about 305 GW, the share of coal-based power generation capacity was 61% (185 GW) (Figure 3.14). Electricity consumption in India grew at a CAGR of 4% between 2011/12 and 2015/16 and was expected to grow at a faster rate considering the efforts of the government to provide universal access to electricity to all households in the country 24/7 (Figure 3.13). This strengthens future growth in demand of non-coking coal in the power sector despite the growth of renewable energy.

Figure 3.13. Trend in Electricity Generation and Electricity Consumption (TWh)

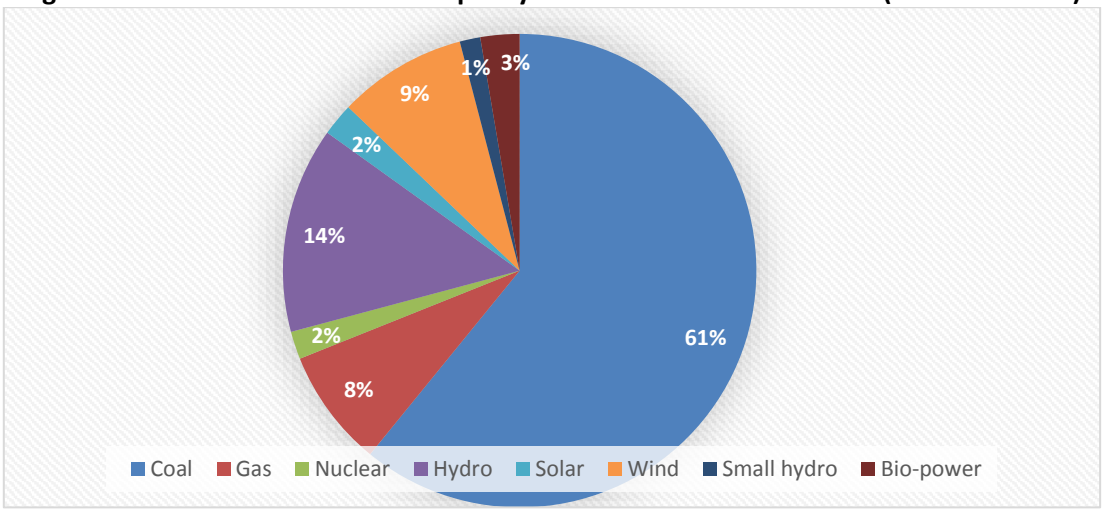


TWh = terawatt-hour.
Source: MoP (2017).

The power sector is extremely cost sensitive as consumers must bear the increase in fuel cost which is passed through the distribution companies that have to recover the same from their retail consumers. The retail tariff in agriculture and domestic categories is cross subsidised by industrial and commercial categories. Thus, the increase in the price at which coal is sold to the power sector has significant implications on the performance of distribution companies as well as in subsidising the consumer categories.

Thus, the GoI is keeping the domestic price of non-coking coal in the regulated sectors substantially below the market prices. The price of non-coking coal (Grades G6 and above) for the power sector has been kept low to convey a subsidy to the electricity consumer.

Figure 3.14. Installed Generation Capacity of the Power Sector in India (31 March 2016)



Source: CEA (2016a).

Chapter 4

Taxes and Subsidies

India has a federal system of taxation wherein the central and state governments/local authorities levy taxes on goods and services based on a taxable event. All taxes levied within India need to be backed by an accompanying law passed by the Parliament or the respective state legislature. India has two conventional types of taxes – direct taxes (income, corporate, capital gains, security transaction, etc.) and indirect taxes. Other taxes include cess – a tax whose revenues are earmarked for a specific purpose. The present study is confined to indirect taxes, which are further classified as producer and consumer taxes for ease of understanding. In India, there are several multi-tiered (central, state, and local levels) and multi-rate indirect taxes. The main indirect taxes are central excise, customs duty, service tax, central sales tax, and value added tax (VAT). Additionally, other indirect taxes, such as entry tax and octroi, are also levied by the state and local governments. The subsequent section explores the tax structure before the implementation of GST on 1 July 2017 in each segment considered for the study.

1. Methodology

The identification of subsidies presented herein is primarily based on a literature review of various government and public documents, and stakeholder consultations. The study also focuses on understanding the implicit and explicit subsidies existing in these product segments and the mechanism of subsidy transfer which in many cases is assessed based on existing data and certain assumptions. This study adopts the definition of subsidy of the International Energy Agency as follows:

'Any government action that lowers the cost of energy production raises the revenue of energy producers or lowers the price paid by energy consumers.'

This definition is designed to capture all the diverse and non-transparent types of energy subsidies that commonly exist. The energy subsidies have been differentiated according to whether they confer a benefit to producers or consumers. While consumer subsidies lower the price to end consumers, producer subsidies involve measures that seek to maintain or expand domestic supply. In certain developing economies such as India, consumer subsidies are more prevalent.

For taxation, the study team reviewed the literature to understand the tax structure associated with each product and aggregated the data available in the public domain. Whenever data availability in the public domain is limited, a bottom–up approach of the price build-up of respective products was carried out considering the consumption of products, final product prices, notified rate of sales tax/VAT in each state, notified distributor commission for

each product, etc. to identify the total tax revenue that each product contributed to the state/central governments. For the purpose of understanding, taxation has been classified into producer taxes and consumer taxes.

In this context, producer taxes are levies on fossil fuel production and import and transport processes until the product reaches the end consumers. The taxation rates are determined by the central government through the MoPNG, Ministry of Coal, and Ministry of Finance. Consumer taxes are levies on the purchase or sale of products to end consumers; here, the taxation rates are determined mainly by the state government/local authorities but a certain tax on interstate purchase is determined by the central government.

Chapter 5

Taxes and Subsidies in the Oil and Natural Gas Sector

In the oil and gas sector, the producer taxes for crude oil/natural gas are determined by the union government through MoPNG and Ministry of Finance, except royalty which is determined by the state government.

Producer taxes which the central government collects are:

- excise duties on the production of crude oil in the form of oil development cess and National Calamity Contingent Duty;
- customs duties on the import of crude oil;
- service tax on pipeline transmission services; and
- certain non-tax revenues, such as royalty, on the production of crude oil and natural gas from offshore regions, etc.

The producer tax which the state government collects is

- royalty (on the production of crude oil and natural gas from onshore regions) for production and sales.

Consumer taxes are collected by the state government in the form of

- sales tax/VAT;
- octroi, duties including electricity duty; and
- entry taxes.

The following discussions detail the components of producer and consumer taxes in the oil and gas sector.

1. Components of Producer and Consumer Taxes in the Oil and Gas Sector

1.1. Central Government Taxes and Duties levied on the Oil and Gas sector

Cess on Crude Oil

The Oil Industry (Development) Act of 1974 provided for the collection of cess as an excise duty on the production of indigenous crude. This cess is not applicable to crude oil production from blocks awarded under the NELP, Marginal Field Policy, and Hydrocarbon Exploration and Licensing Policy. The cess rate was changed from Rs60 per ton in 1974 to Rs4,500 per ton until February 2016. Subsequently in March 2016, with the fall in crude oil prices and request from oil producers, the government changed the oil industry development cess rate to ad valorem at 20% from earlier specific rate (OIDB, 2016). Table 5.1 details the cess revisions from 1974.

Table 5.1. Revisions in the Cess Collected on Crude Oil per Ton

Date	Revised Nominal Cess
23 July 1974	Rs60
13 July 1981	Rs 100
15 February 1983	Rs 300
1 March 1987	Rs 600
1 February to 28 February 2002	Rs 900
1 March 2002	Rs 1800
1 March 2006	Rs 2500
17 March 2012	Rs 4500
1 March 2016	20%

Source: OIDB (2016).

Customs Duty

Customs duties are levied on the import of goods into India and are paid by the importers. The customs duties on imports comprise the following:

- Basic customs duty – levied on the assessable value of the imported goods according to the terms of the Customs Valuation Rules
- Additional customs duty – levied in lieu of excise duty on goods manufactured in India
- Special additional customs duty – levied in lieu of VAT payable on the sale of similar goods in India
- Cess (tax) – composed of education cess and secondary and higher education cess.

The duty rates are specified under the Customs Tariff Act, 1975, and are revised by the central government annually Deloitte (2016).

Excise Duty

The central value added tax or excise duty is the levy on manufacturing and production of 'excisable goods' in India according to the Central Excise Act, 1944. Excise duty is mostly imposed as a percentage of the transaction value of goods. However, for certain goods, the excise duty is based on the maximum retail price reduced by a prescribed abatement. In the oil and gas sector, petroleum products produced in India are levied excise duties. Concessions/exemptions to excise duty are available for some specified oil and gas products, such as crude oil, SKO, and LPG. No excise duty is levied on the domestic production of crude oil, which attracts the National Calamity Contingent Duty as well as an oil development cess. Also, excise duty is levied on certain petroleum products as a mix of specific and ad valorem duties EY (2015).

Service Tax

Since 1 July 2012, the negative list regime for the levy of service tax has been in force. Under this regime, any activity undertaken by one person on another person's behalf for consideration within the taxable territory (i.e. the whole of India, except Jammu and Kashmir)

is liable to service tax unless included in the negative list or notified as an exempt service. The rate of service tax has been increased in stages to 14% (Deloitte, 2016). In the oil and gas sector, effective 1 July 2012, the service tax is applied on the following:

- any service provided in the territorial waters, continental shelf, exclusive economic zone, or any other maritime zone as per the Territorial Waters, Continental Shelf, Exclusive Economic Zone and other Maritime Zones Act, 1976;
- any service provided in the seabed and the subsoil underlying the territorial waters and the air space above its territory and territorial waters; and
- installations, structures, and vessels located in the continental shelf of India and the exclusive economic zone of India for the purposes of prospecting or extraction or production and supply of mineral oil and natural gas.

Notably, in the oil and gas sector, services in the production process such as the survey, exploration, and mining/production of oil and gas are liable to service tax EY (2015).

1.2. State/local government taxes and duties levied on the oil and gas sector

Producer Tax: Royalty on production of crude oil/natural gas:

Under Section 14 of the Petroleum and Natural Gas (PNG) Rules, 1959, Royalty is payable to the state government on the production of crude oil and natural gas from onshore regions and to the union government for production from offshore regions. Royalty on crude oil is regulated by Section 6A of the Oil Fields (Regulation and Development) Act 1948, the PNG Rules, 1959, and the PNG (Amendment) Rules, 2003. As per the related notifications, the rate of royalty for any mineral oil, which includes crude oil, shall not exceed 20% of the sale price of the mineral oil at the oil fields or well-head (DGH, 2015). The royalty rates under the respective regimes are as follows:

NELP blocks: Crude oil/condensate – 12.5% for onshore, 10% for offshore, and 5% for the first 7 years and 10% after 7 years for deep water (on ex-royalty basis)

Natural gas – 10% for onshore and offshore ex-royalty basis, 5% for the first 7 years and 10% after 7 years for deep water, on ex-royalty basis, beyond 400 m isobaths

Nomination blocks: Crude oil/condensate – 20% for onshore cum royalty basis, 10% for offshore cum royalty basis

Gas – 10% for both onshore and offshore cum royalty basis

Pre-NELP discovered fields: Crude oil/condensate, 20% for onshore cum royalty basis. Licensee pays at a specific rate of Rs481–528 per MT stipulated under the PSC and the difference in rate is paid by the centre to the states at Rs481–528 per MT as per the PSC for offshore.

Gas – 10% for both onshore and offshore on ex-royalty basis

Pre-NELP exploration blocks: Crude oil/condensate, 20% for onshore blocks cum royalty basis, 10% for offshore blocks cum royalty basis

Gas – 10% for both onshore and offshore on ex-royalty basis

Consumer Taxes: Sales Tax/VAT

The consumer taxes, particularly for the consumption of petroleum products, is a major source of revenue for the state government. It basically comprises sales tax/VAT or CST. VAT is levied on the sale of goods within a state, that is, where the goods move intra-state as a condition of sale and the CST is levied on the sale of goods from one state to other. The CST is levied at 2%[6] or a rate equivalent to the local VAT rate in the dispatching state. In the oil and gas sector, crude oil has been declared under the CST Act as one of the 'goods of special importance' in inter-state trade and commerce; hence, VAT or the CST on the sale of crude oil cannot be levied higher than 5%. VAT rates are based on the nature of product and the state where they are sold EY (2015).

3.1. Octroi

The state government levies octroi when the product enters the state. It is applicable in only a few states in India. The octroi varies from 3% to 6% of the product value.

3.2. Entry Tax

Entry tax is a levy on the movement of goods from one state to another imposed by the state governments in India. It is levied by the recipient state to protect its tax base.

4. GST in the oil and gas sector

The current regime of indirect taxation is being replaced by the Goods and Sales Tax (GST), which came into effect on 1 July 2017. It subsumed the central taxes such as service tax, excise duty, and CST as well as state taxes, such as sales tax/VAT and entry tax. It is a dual component tax, consisting of central GST and state GST. The tax is levied concurrently by the centre and the states on every transaction of supply of goods and services. Certain petroleum products (crude oil, natural gas, high-speed diesel, petrol, aviation turbine fuel) remained outside the ambit of the GST until a date to be determined by the GST Council. Until then, the existing indirect taxation regime will continue for these items, implying that production/manufacture of these specific items would continue to attract excise duty and the sale of these products would be subject to VAT/CST as applied in the pre-GST regime. The specified petroleum products would, therefore, be subject to the current regime on the output side and to the GST regime on the procurement side, with the GST also applying to non-specified petroleum products. Rolling out of a single taxation structure will hopefully reduce multiple incidence of

[6] Subject to the provision of declaration forms prescribed under the CST Act.

taxes and create a more streamlined structure for tax collection. However, for this study, the pre-GST regime is considered as it existed during the required study period 2015/16.

5. Subsidies

The only existing subsidised products in oil and gas sector are domestic LPG and PDS kerosene which together constitute majority of the total subsidy (around 98% of the total expenditure) in 2015/16; the rest is for consumption of natural gas in the northeastern states. The private sector has a very small share in the oil marketing segment largely because the sector is not entitled to receive any subsidy from the government on selling subsidised products.

In India, the subsidy transfer mechanism has been mainly in two forms – direct subsidy through cash transfers and under-recovery.

Direct Subsidy

Fiscal subsidy is the direct budgetary support provided on a specific basis to public sector OMCs in respect of designated subsidised petroleum products.

Under-recoveries to OMCs

The central government regulates prices so that government-owned OMCs – Indian Oil Corporation Ltd [IOCL], Bharat Petroleum Corporation Ltd, and Hindustan Petroleum Corporation Ltd – sell certain petroleum products below market rates, leading to 'under-recoveries'. Under-recoveries are calculated as the difference between the market-determined price and the regulated price at which petroleum products are finally sold by the OMCs to the consumers after accounting the subsidy paid by the government. Since 2009/10, the government has been providing cash assistance as and when required, which varies from time to time. Under this mechanism, the under-recoveries are shared amongst government and upstream and downstream companies. This financially burdens upstream companies as they are to compensate a part of the subsidy as per the subsidy-sharing mechanism notified by the government. But the government has not been paying in fixed times and releases these quite late, thereby restricting the cash flows and liquidity of the OMCs. The under-recoveries compensation mechanism until 2008/09 was off-budget assistance in the form of government-backed 'oil bonds' issued to the OMCs. These were issued in tranches over a financial year and accounted as income in the OMCs' profit and loss statements. Interest rates were set anywhere between 6% and 9% and the maturity period was up to 20 years. However, following the budget announcement in 2009/10, the government started providing cash subsidy to the oil companies in place of oil bonds.

The practice of sharing the under-recovery involved the sharing of subsidy burden by the government and upstream and downstream PSUs. In April 2015, the MoPNG notified the upstream producers, ONGC (Oil and Natural Gas Corporation) and Oil India, of the new subsidy-sharing formula that would be applicable to compensate the OMCs. The subsidy formula stated that if the crude oil average price in each quarter is less than US$60/barrel, the upstream oil companies will not bear any subsidy costs. When oil prices are above

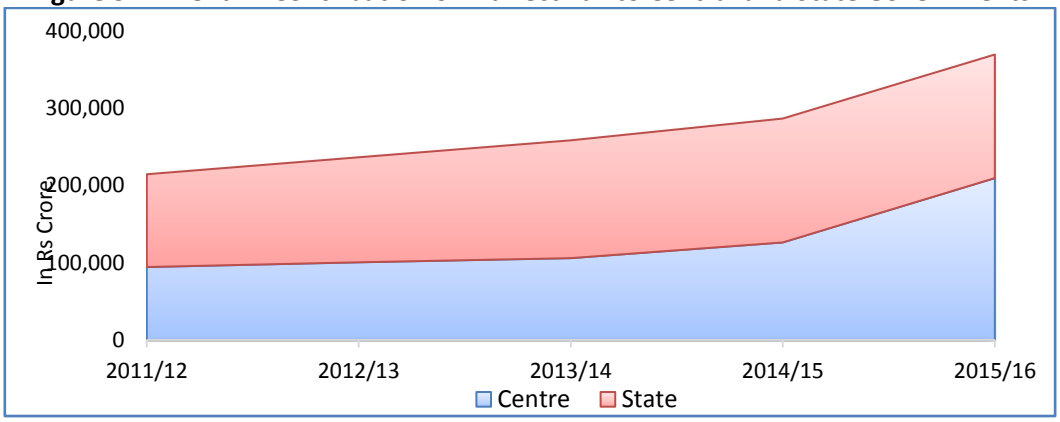
US$60/barrel, upstream companies must bear 85% of the incremental cost above US$60/barrel; and if oil price crosses US$100/barrel, the oil companies will bear 90% of the incremental cost above the $60/barrel price.

Noticeably, after the implementation of the direct benefit transfer for LPG (DBTL) in 2015/16, due to low crude oil prices, the government took almost the entire subsidy burden on the sale of domestic LPG for 2015/16 (MoPNG, 2016b).

2. Analysis of Taxation and Subsidies

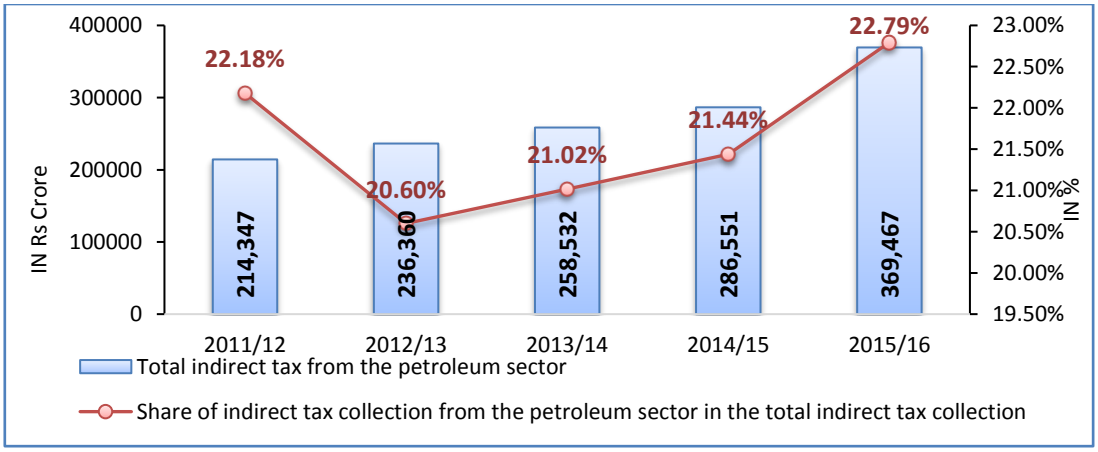
The oil and gas sector is one of the largest contributors to the Indian treasury and an important source of revenue (both via direct and indirect taxes) for the central and state governments of India. The indirect tax is an integral part in the end price of the products and the total collection from the oil and gas sector contributed around one-fourth of the total indirect tax collection across the sectors during 2015/16. The total collection of indirect taxes, contributed to state and central governments, is shown in Figure 5.1.

Figure 5.1. Trend in Contribution of Indirect Tax to Central and State Governments



Source: PPAC (2016b).

Figure 5.2. Total Indirect Tax Collection from the Petroleum Sector and its Share in the Total Indirect Tax Revenue

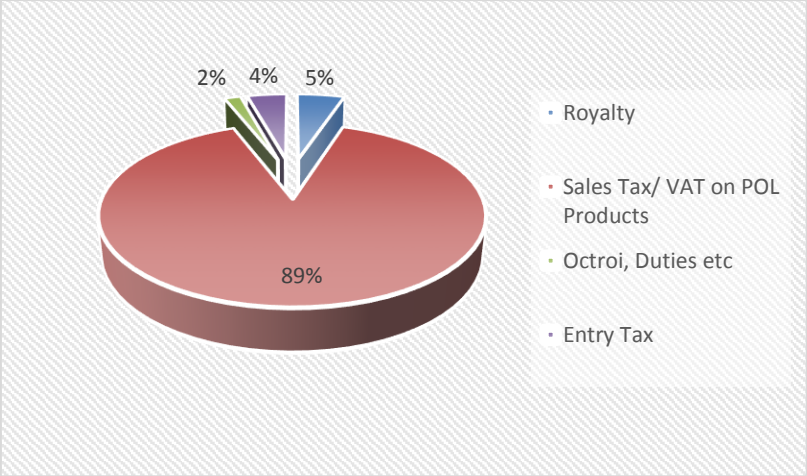


Sources: PPAC (2016b), Ministry of Finance (2017).

The tax collected by the central government grew at the rate of 23% from 2012/13 to 2015/16. On the other hand, the state government's indirect tax collection increased only at a CAGR of 5.6% between 2011/12 and 2015/16 (Figure 5.1). The trend in the share of state taxes in the overall indirect tax collection between 2010/11 and 2015/16 represents the fiscal imbalance between the centre and the states (Figure 5.2), mainly attributed to the global volatility in crude oil prices and the taxation structure.

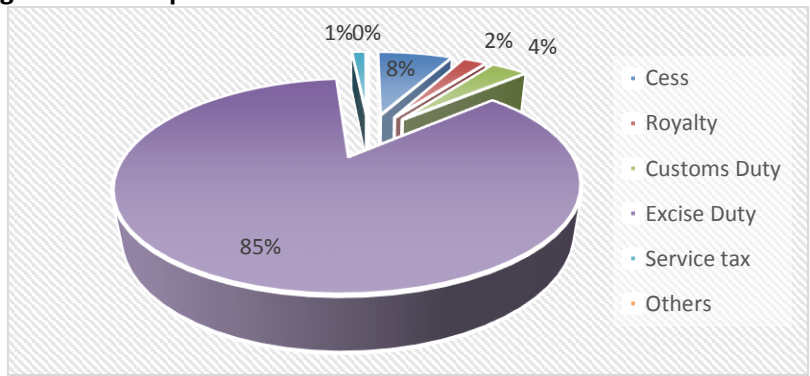
The indirect tax composition of the central and state treasuries' revenue from the oil and gas sector for 2015/16 is shown in Figures 5.3 and 5.4. The excise duty is the main source of central revenue, contributing 85% of the total indirect tax collection during 2015/16, levied on the production of petroleum products (Figure 5.3). The second-largest collection is in the form of oil development cess, levied on the production of crude oil, collected by the OIDB and directed towards development and research in the oil and gas sector. In case of tax revenue to state governments, the biggest source is in the form of sales tax/VAT which constitutes 89% of the total indirect tax collection from the sector during 2015/16 (Figure 5.4). This is collected at the point of sale of crude oil, natural gas, and petroleum products as per the notified rates.

Figure 5.3. Composition of Central Revenues from the Oil and Gas Sector



POL = petroleum, oil, and lubricants.
Source: MoPNG (2016a).

Figure 5.4. Composition of State Revenues from the Oil and Gas Sector

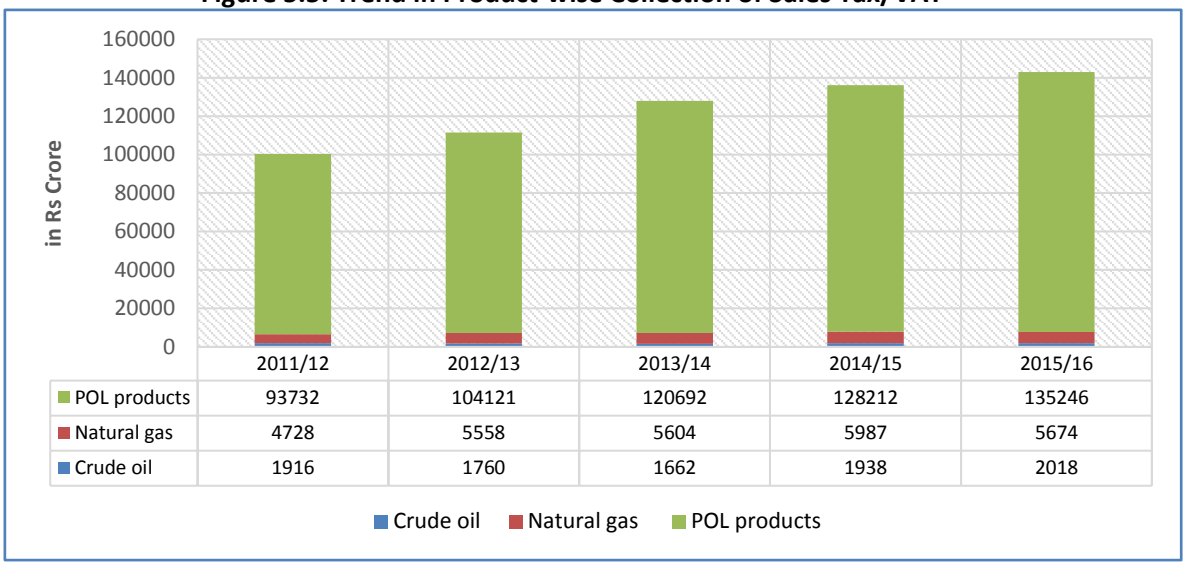


Source: MoPNG (2016a).

Besides these, the central and state governments also collect certain non-tax components, such as royalty, on oil and gas production. The direct taxes levied on the sector include corporate/income tax, dividend income to central and state governments, and dividend distribution tax and profit petroleum on exploration of crude oil/natural gas. However, this report focuses on the indirect taxation in the oil and gas sector.

The consumer taxes in the sector have grown by a CAGR of 9.2% from 2011/12 to 2015/16. The growth was mainly from the increased sales tax/VAT contribution from petroleum products, which increased at a CAGR of 9.6% between 2011/12 and 2015/16 (Figure 5.5).

Figure 5.5. Trend in Product-wise Collection of Sales Tax/VAT



	2011/12	2012/13	2013/14	2014/15	2015/16
POL products	93732	104121	120692	128212	135246
Natural gas	4728	5558	5604	5987	5674
Crude oil	1916	1760	1662	1938	2018

POL = petroleum, oil, and lubricants.
Source: MoPNG (2016a).

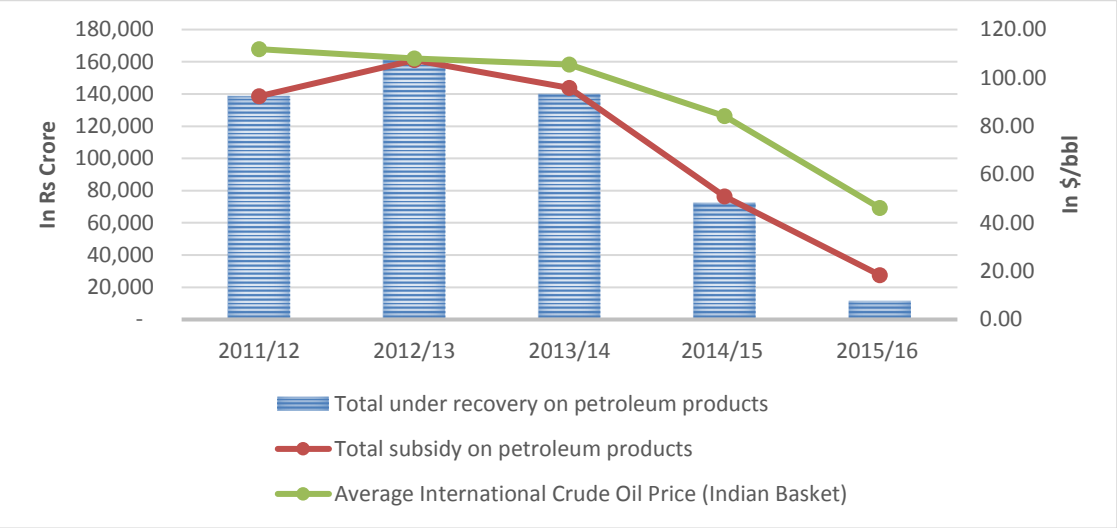
On the subsidy side, the deregulation of petrol and diesel brought down the burden on the GoI from the oil and gas sector to about 12% of the total subsidy provided under the 2015/16 budget from 31% of the total subsidy provided in 2011/12. The petroleum subsidy in 2012/13 accounted for 1.05% of GDP, which later gradually declined to 0.26% by 2015/16.The average prices of international crude oil (Indian basket) declined by 45.14%, from US$84.19 per barrel in 2014/15 to US$46.18 per barrel in 2015/16. Consequently, the subsidy incidence also decreased by 50% over the same period. The oil and gas industry was the third most subsidised sector, with the government providing about Rs30,000 crore in 2015/16 (Table 5.2).

Table 5.2. Extent of Government Subsidies to the Oil and Gas Sector

Year	Total Subsidies (in Rs Crore)	Petroleum Subsidies from the Government Budget (in Rs Crore)	Petroleum Subsidy as % of Total Subsidy	Total Subsidy as % of GDP	Petroleum Subsidy from the Government Budget as a % of GDP
2011/12	217,941	68,484	31.4	2.49	0.78
2012/13	257,079	96,880	37.6	2.79	1.05
2013/14	254,632	83,998	33.4	2.59	0.86
2014/15	258,258	60,269	23.3	2.45	0.57
2015/16	257,801	30,000	11.64	2.27	0.26

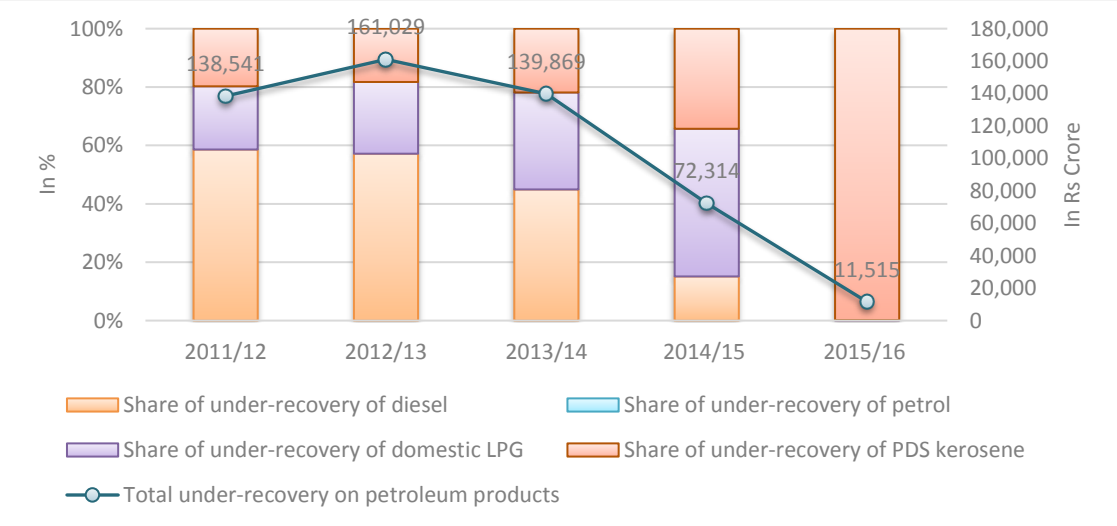
Source: MoPNG (2016a), Authors' compilation.
*Petroleum subsidies budgeted under GoI.

Figure 5.6. Trend in Total Under-recovery, Subsidies on Petroleum Products



Sources: PPAC (2018), OGD Platform India (2018).

Figure 5.7. Trend in Total Under-recovery vis-à-vis Share of Under-recovery of PDS Kerosene, Domestic LPG, Petrol, and Diesel



Source: PPAC (2018).

Also, there was a sharp fall of 93% in the under-recovery on petroleum products between 2012/13 and 2015/16 because of the deregulation of diesel in 2014 and reduced international crude oil prices (Figure 5.7).

Between 2012/13 to 2015/16, net indirect tax revenue grew by 61.5%, from 31% in 2012/13 when the crude oil price averaged at US$108/bbl to 92.5% in 2015/16 when the crude oil price fell down and averaged US$46/bbl. The share of under-recoveries out of the total indirect tax revenue from the petroleum sector decreased by 65% between 2012/13 and 2015/16, from 68% in 2012/13 to just 3% in 2015/16 under the prevailing crude oil prices which significantly reduced the impact on oil companies in realising their cash flows in a timely manner.

2.1. Crude Oil

The following section presents the analysis of the subsidies and taxes in the crude oil segment, including the methodology adopted for the study.

Methodology

Data was captured primarily through literature reviews of various government documents and annual reports of oil companies. Table 5.3 shows the components of subsidy and taxation rates for crude oil for 2015/16.

Table 5.3. Tax and Subsidy Components Considered in the Crude Oil Segment

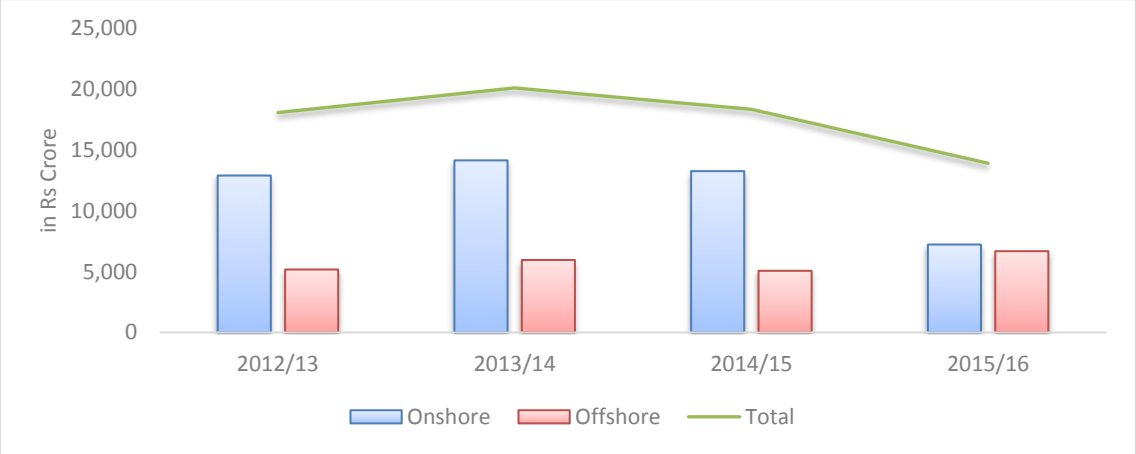
Tax and Subsidy Components		Considerations of Crude Oil Segment Study
Royalty	Onshore production	✓
	Offshore production	✓
Customs duty (Imported crude)		✓
Oil development cess		✓
National calamity contingent duty		✓
Sales tax/value added tax		✓
Central sales tax		✓
Entry tax/octroi*		✗

*Data not available in public domain.
Source: Authors' analysis.

Analysis:

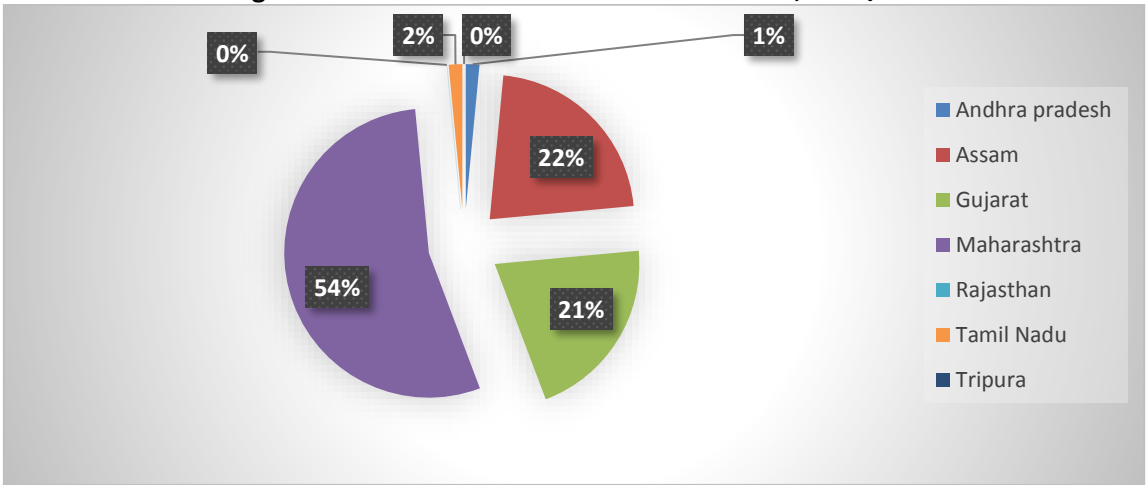
The literature review data has been represented in graphical format in order to bring out meaningful inferences about the revenue from different components of indirect taxes in crude oil segment.

Figure 5.8. Trend in Region-wise Collection of Royalty on the Production of Crude Oil



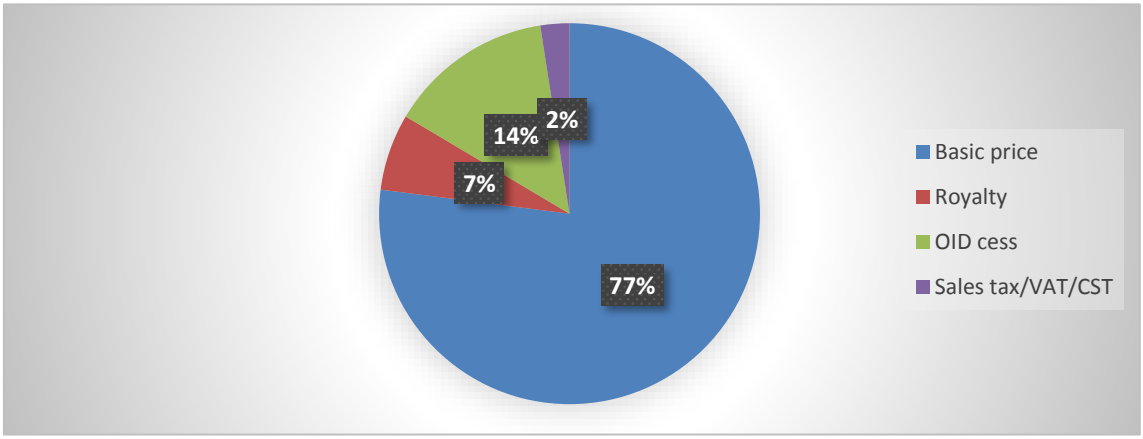
Source: MoPNG (2016a).

Figure 5.9. Collection of Sales Tax on Crude Oil, 2015/16



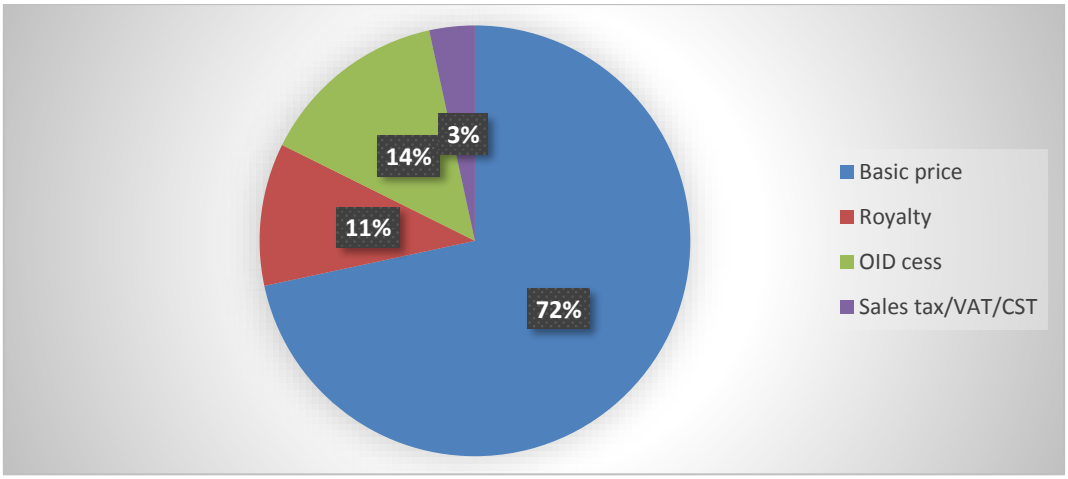
Source: MoPNG (2016a).

Figure 5.10. Representative Share of Cost Components including Taxes on a Barrel of Offshore Crude



CST = central sales tax, VAT = value added tax.
Source: MoPNG (2016a).

Figure 5.11. Representative Share of Cost Components including Taxes on a Barrel of Onshore Crude

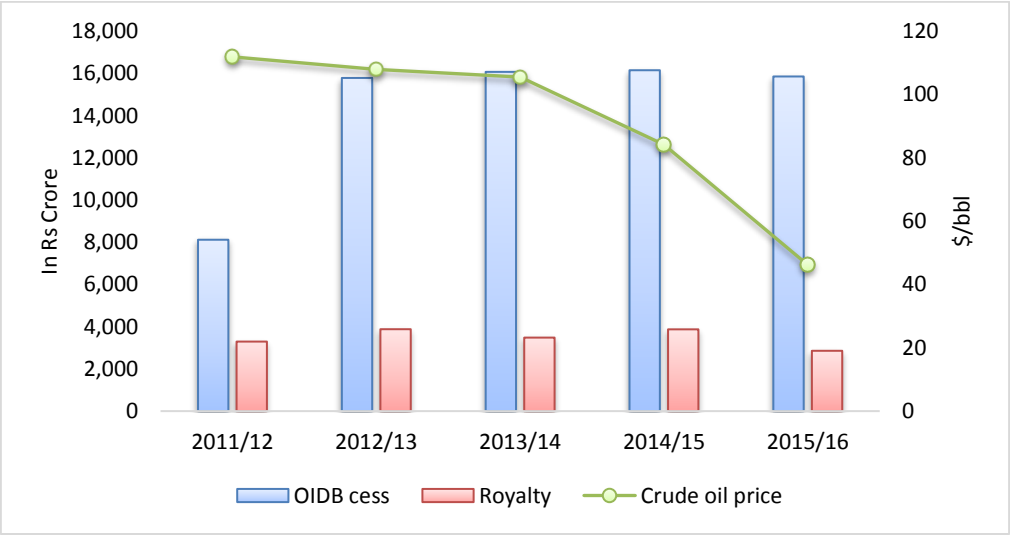


CST = central sales tax, OID = oil industry development, VAT = value added tax.
Source: MoPNG (2016a).

OIDB cess issue

The government levied a 20% OIDB cess as an excise duty for the domestic production of crude oil from nominated blocks given to PSU upstream companies, amounting to Rs4,500/MT until the end of 2015/16. As the price of crude oil dropped to US$30–US$40 per barrel, the fixed OIDB cess rate of Rs4,500/MT became a big burden to the oil producers as they were already facing losses, because of production costs. Therefore, the government revised the OIDB cess in the 2016 budget and made it 20% ad valorem, providing some relief to the oil producers at the prevailing prices. However, as crude oil prices went up, reaching US$65/ barrel, the OIDB cess also went up higher than the earlier rate of Rs4,500/MT, again posing a challenge to the oil producers as they could not make profit. This impacted further investment and, hence, led to the development of new oil and gas fields in the sector.

Figure 5.12. Trend in the Collection of OIDB Cess and Royalty



Source: MoPNG (2016a).

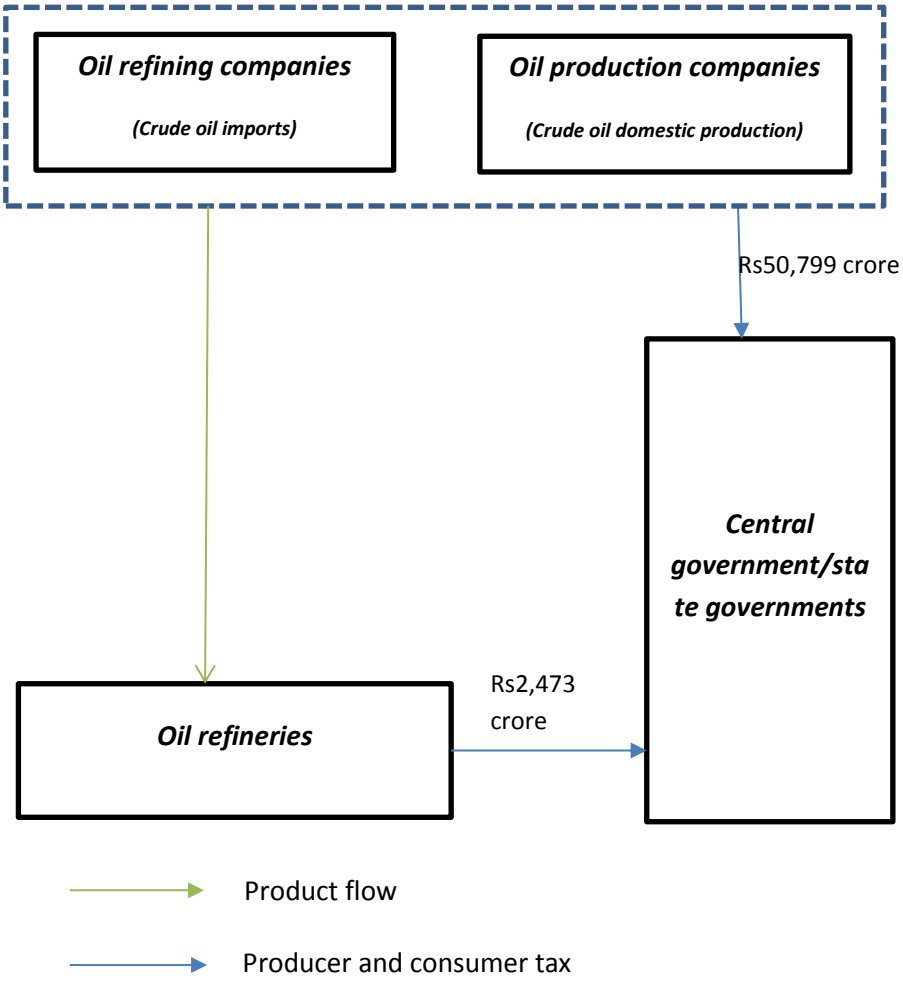
Results:

In case of crude oil, the tax revenues are dependent on domestic production and global crude oil prices. In 2015/16, the Indian basket of crude oil price fell to US$46/bbl, which impacted the tax inflow to the government. Also, the share of royalty and sales tax in the cost of barrel for onshore crude (4% and 1%, respectively) is higher than offshore crude (Figures 5.11 and 5.12). During this period, owing to the low international crude oil prices and marginally declining domestic production, the collection of royalty decreased by 45% from onshore regions (Figure 5.6), which is levied on an ad valorem basis. Also, customs duty collection was reduced to Rs456 crore, despite the marginal increase in crude oil imports. On the other hand, the oil development cess and national calamity contingent duty collections, which are on specific basis at Rs4,500/MT and Rs50/MT, respectively, remained at the same level (Figure 5.12). In FY 2015/16, the state of Maharashtra collected the highest sales tax at 54% of the total sales tax payment for crude oil, followed by Assam and Gujarat with 22% and 21%, respectively (Figure 5.9).

Value chain diagram for the crude oil segment (Figures in Rs crore)

Figure 5.13 represents the product and tax flows across various entities. In the crude oil segment, the producer taxes contributed by the oil companies to the central exchequer in 2015/16 from royalties, customs duties, national calamity contingent duty and oil development cess amounted to Rs50,799 crore. The sales tax/VAT contributed to the central and state treasuries from the purchase of crude oil by oil companies for refining amounted to Rs2,473 crore.

Figure 5.13. Value Chain Diagram for Crude Oil Segment (Figures in Rs Crore)



Source: Authors' compilation.

2.2. Liquefied petroleum gas (LPG)

In the LPG segment, around 88% of the consumption is for domestic purposes (14.2 kg cylinder), and within that 88% is subsidised. Hence, the domestic LPG subsidised sub-segment was considered for the study. The detailed methodology and assumptions adopted for the study are described below.

Methodology:

To determine the total indirect tax inflow/outflow in this segment for 2015/16comprising sales tax/VAT and other additional taxes collected from the total sale of subsidised domestic LPG, certain assumptions were made since no segmental data on the revenue collected by the central and state governments are available in the public domain. On the subsidy granted by the central government to corporations, such as IOCL, Hindustan Petroleum Corporation Ltd, Bharat Petroleum Corporation Ltd, and their agencies, several state governments are not levying tax and passing on to the consumers during the sale of domestic LPG. Therefore, the tax levy on subsidy is not required in estimating the total indirect tax collection.

The study team conducted the following steps for the estimation:

- Carried out a bottom-up approach to assess the total indirect tax collection from the domestic LPG (subsidised) segment.
- Studied the price build-up for Delhi and took the reference structure for the subsidised domestic LPG price estimation across the states (see Annex IV).
- Considered the subsidy and taxation components in the price build-up based on the literature review (Table 5.4).
- Captured the state-wise domestic LPG consumption data and the average RSP of domestic un-subsidised LPG for the capital city of every from the public domain, databases, and various stakeholder consultations. The study team took these as reference for the respective state for the year 2015/16.
- The distributor's commission of the respective year which was the same for all the states across the country was considered in the study and the sales tax/VAT rates notified for each state were taken for the estimation (see Annex II).
- The excise and the import duties are exempted for the domestic LPG and are considered zero.
- Based on the aforesaid assumptions, the market price of subsidised domestic LPG was determined and based on the sales tax/VAT rates notified on respective states, the estimation of total indirect tax collection was completed.

Table 5.4. Tax and Subsidy Components Considered for the Subsidised LPG for Domestic Purposes

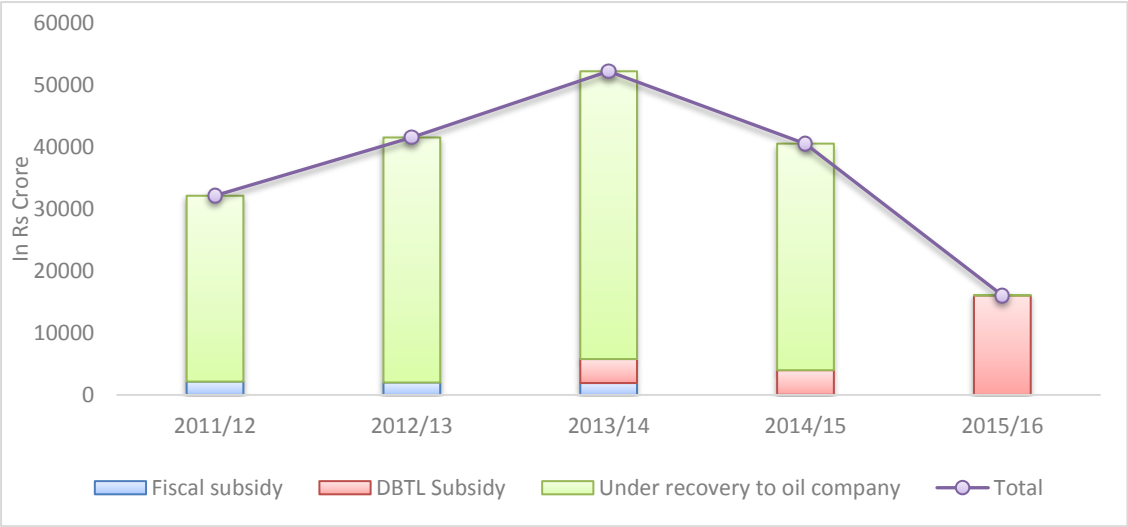
Tax/Subsidy Components	Considerations of Subsidised LPG for Domestic Purposes
Customs duty	Exempted
Excise duty	Exempted
State specific costs	✓
Entry tax/octroi	✓
VAT	✓
Uncompensated costs	✓
Under-recovery to OMCs	✓
Cash compensation under DBTL	✓

DBTL = direct benefit transfer for LPG, OMC = oil marketing company, VAT = value added tax.
Source: Authors' analysis.

Results:

During 2015/16, the GoI implemented the DBTL across the states and the entire subsidy was provided directly from the government budget by ceiling certain price components such as delivery charges, etc. The total subsidy amounted to Rs16,074 crore, out of which Rs18 crore was absorbed by the OMCs into their balance sheets (Figure 5.14).

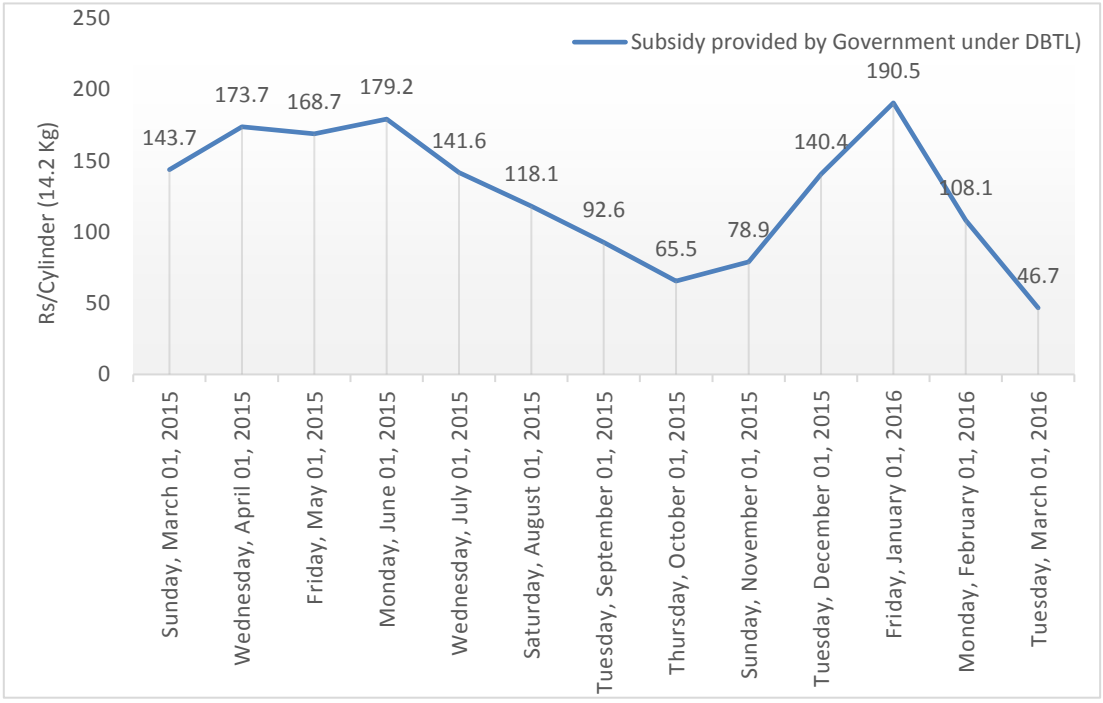
Figure 5.14. Trend in Subsidies in the LPG Segment



Source: PPAC (2016a).

In addition to their share in the total LPG subsidy recorded, the OMCs absorbed around Rs4,913 crore in the form of uncompensated costs, as per the PAHAL (DBTL) scheme in 2015/16 (Annex IV). Even though this estimated amount is not recorded anywhere, it is considered in the value chain diagram (See figure 5.17) to get a real picture of total subsidy in the domestic LPG segment. In year 2015/16, the domestic LPG subsidy per cylinder absorbed by the government was Rs46.7–Rs190.5 when the price of crude oil was hovering between $40 and $50 per barrel (Figure 5.15).

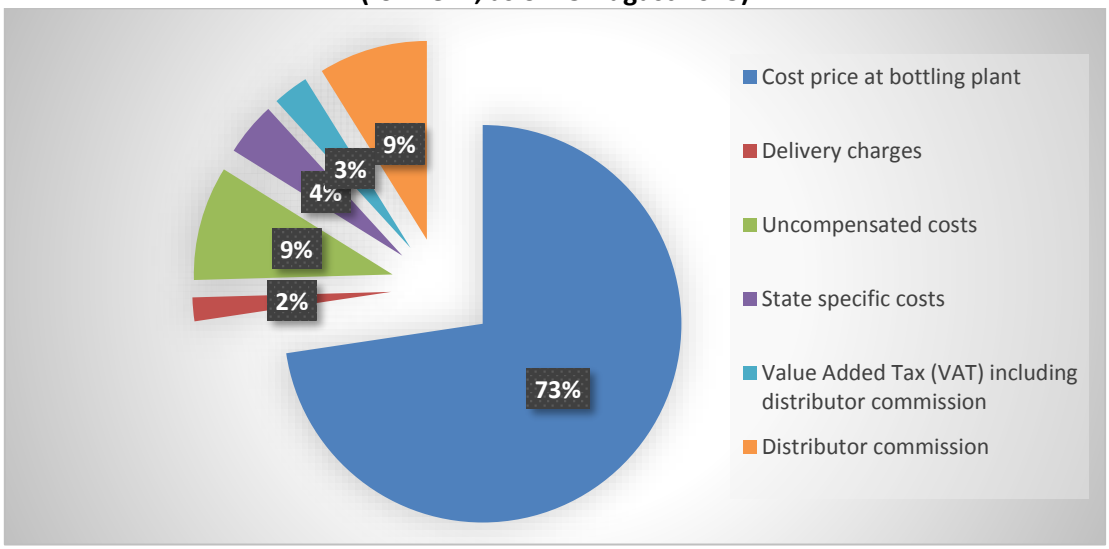
Figure 5.15. Government Subsidy under the DBTL



Source: PPAC (2018).

The cost components in the price build-up of domestic LPG (subsidised) at Delhi, such as the DBTL subsidy, the uncompensated[7] costs, state specific costs,[8] and sales tax/VAT account for 11%, 9%, 4%, and 3%, respectively (Figure 5.16). The sales tax/VAT on domestic LPG (Subsidised) varies from 0% to 5% from state to state. This has contributed approximately Rs1,347 crore to the state governments, and accounts for about 0.9% of the total sales tax collection for petroleum products. Moreover, considering the efforts put in place by the government to increase the penetration of LPG in the rural parts of the country with the rising global crude oil price, more subsidies would be required in the domestic LPG segment for meeting the objective.

Figure 5.16. Cost Components in the Price Build-up of LPG (for Delhi, as of 15 August 2015)



Source: Authors' estimation.

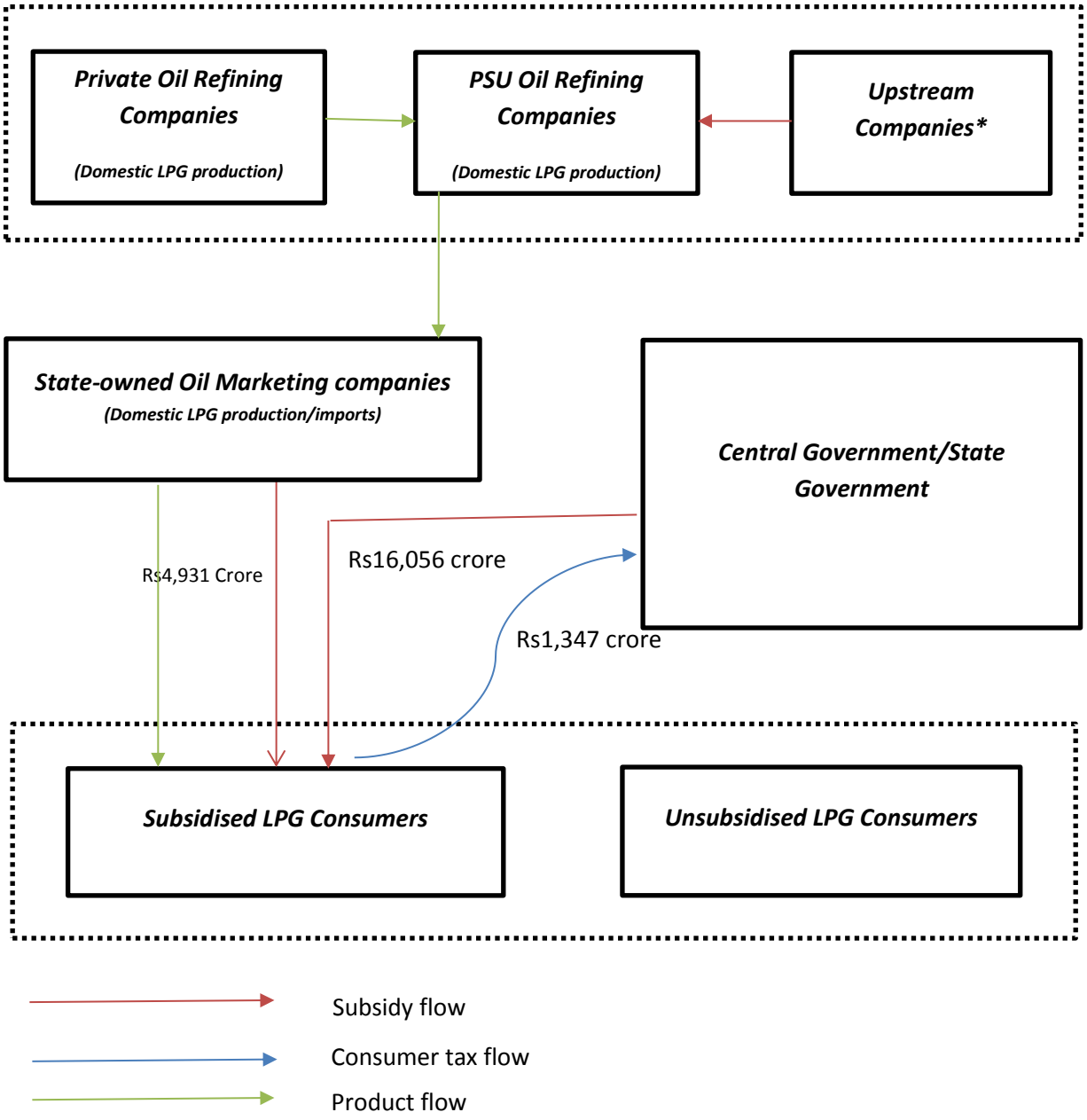
Value chain diagram of the domestic LPG segment (Figures in Rs crore)

The value chain diagram for domestic LPG (subsidised) segment represents the product, subsidy, and tax flows across various entities (Figure 5.17). In the domestic LPG (subsidised) segment, the subsidy amounting Rs16,074 crore that the central government provided under the DBTL scheme reached customers directly. Out of this amount, Rs18 crore was the under-recovery to the OMCs which they absorbed to the balance sheet for 2015/16. The consumer taxes contributed by the domestic LPG (subsidised) segment to the state treasury for sales tax/VAT, additional cess, etc. amounted Rs2,473 crore in 2015/16.

[7] Uncompensated costs – In the price build-up, oil marketing companies (OMCs) are charging consumers on account of import costs, recovery for non-revision in prices, rounding-off, and differential delivery charges of Rs7.9/cyl. All these costs are not compensated to the OMCs as per the PAHAL (DBTL) scheme.

[8] State specific costs – To neutralise the under-recoveries to the oil companies caused by various irrecoverable/non-recoverable taxes and levies of state/union territories/municipal corporations, a state-specific surcharge/cost is considered in the selling prices of petroleum products.

Figure 5.17. Value Chain Diagram for Domestic LPG (Subsidised) Segment (Figures in Rs Crore)



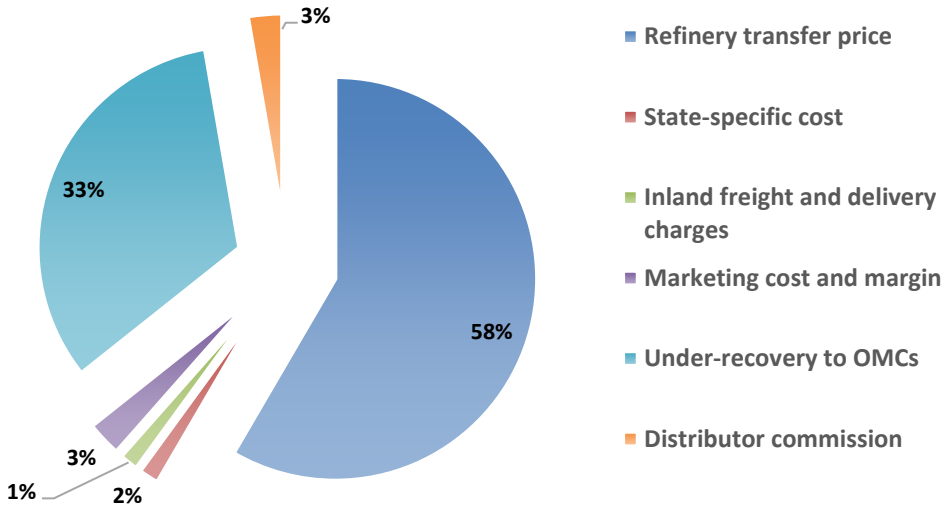
*Upstream crude oil producers provide their share of LPG subsidy through price discounts of crude oil.
Source: Author's compilations

2.3. Kerosene

The price determination of kerosene is complex as the subsidy mechanism is different compared to the DBTL in the domestic LPG segment. During 2015/16, the under-recovery and the burden-sharing mechanism was presented in the kerosene segment which was reduced owing to the low crude oil prices. The under-recovery by the oil companies amounted to Rs11,496 crore, to which the upstream oil companies shared a burden of Rs1,251 crore by giving cash discounts in the crude oil price to PSU oil companies and the rest was provided by the government (Figure 5.19). Also, the government is planning to phase out subsidies and reduce allocation of kerosene through the PDS in a progressive manner. On the other hand, the government is also planning to implement the direct benefit transfer of kerosene throughout the country to reduce the diversion of kerosene for other purposes and to streamline the subsidy transfer. As the data on varying subsidies to oil companies from different depots and states are unavailable in the public domain and with the stakeholders, the study has been limited to subsidy allocation in the kerosene segment. Based on the data availability, the city of Mumbai was considered for representative price build-up of PDS kerosene in 2015/16 (see Annex V).

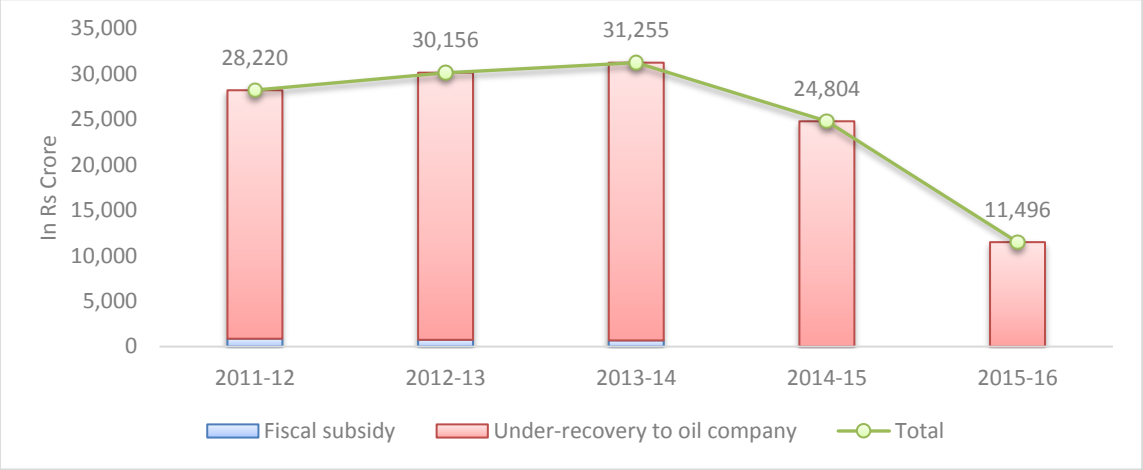
Such price build-up of PDS kerosene in Mumbai shows that the total subsidy (under-recovery to OMCs) accounts for almost 33%, and sales tax/VAT accounts for 1% of per litre of fuel price (Figure 5.18). The sales tax/VAT for PDS kerosene varies from 0% to 5% from state to state.

Figure 5.18. Cost Components in the Price Build-up of PDS Kerosene (for Mumbai, as of 15 August 2015)



Source: PPAC (2016a).

Figure 5.19. Trend of Government Subsidy to the Kerosene Segment

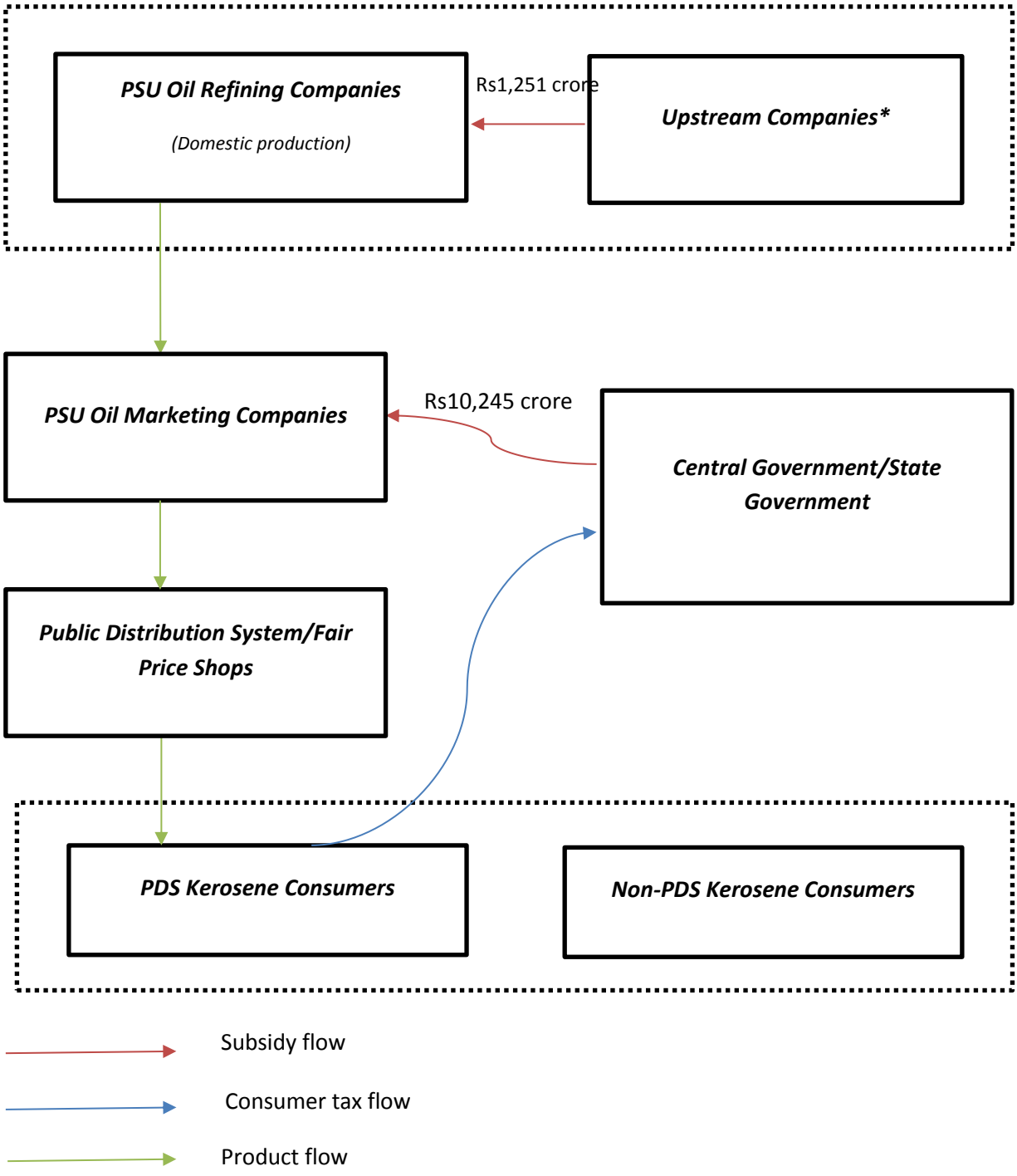


Source: PPAC (2016a).

Value chain diagram of kerosene segment (Figures in Rs crore)

Figure 5.20 represents the product, subsidy, and tax flows across various entities. In the PDS kerosene segment, the subsidy provided by the central government amounted to Rs11,496 crore, out of which Rs1,251 crore was under recovery to oil companies, shared by the upstream oil companies. The consumer taxes are not calculated.

Figure 5.20. Value Chain Diagram for the PDS Kerosene Segment (in Rs Crore)



*Upstream crude oil producers provide their share of LPG subsidy through price discounts to crude oil.
Source: Authors' compilation.

2.4. Natural gas

The following section presents the analysis of the subsidies and taxes in the natural gas segment. The methodology adopted for the study is described below.

Methodology

The data for the study was taken primarily through literature reviews of various government documents and annual reports of oil companies. Table 5.5 shows the components of subsidy and taxation rates for natural gas considered under the study for 2015/16.

Table 5.5. Tax and Subsidy Components Considered for Natural Gas

Tax and Subsidy Components		Considerations of natural gas segment study
Royalty	Onshore production	✓
	Offshore production	✓
Customs duty		✓
Service tax		✓
Sales tax/VAT		✓
Central sales tax		✓
Entry tax/octroi*		✗
Subsidy for natural gas consumption in the northeastern region		✓

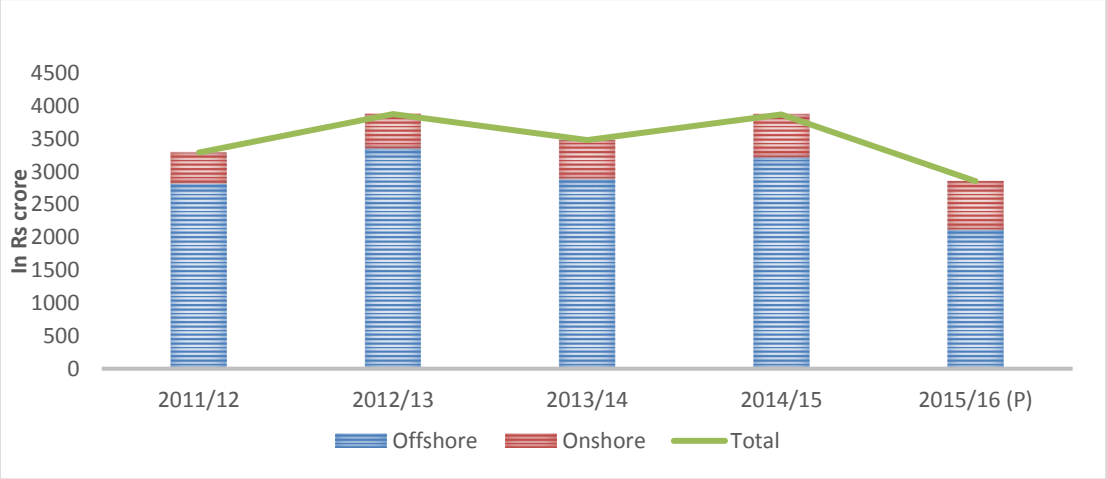
*Limited data availability in the public domain.
Source: Authors' analysis.

Results

In 2015/16, due to the decline in prices and production of natural gas, the producer taxes, such as royalty collection, dropped by 26% to Rs2,858 crore from Rs3,874 crore in 2014/15 (Figure 5.21). On the other hand, the import of natural gas in the form of LNG ramped up due to the upsurge in demand from the end-use sectors, such as fertilisers, power, and city gas distribution, driven by low spot prices.

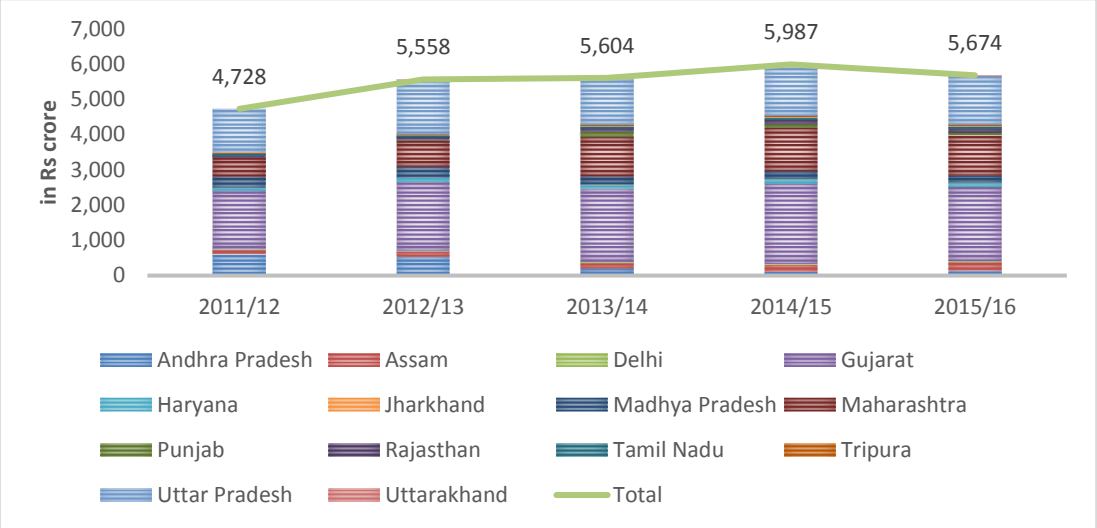
As a result, consumer taxes, such as sales tax/VAT, remained unaffected and were maintained at the 2013/14 level of Rs5,674 crore. The sales tax/VAT rates for the consumption of natural gas varied from 0% to 25% from state to state. Total collection of sales taxes from the natural gas sector increased at a CAGR of 6.7% between 2010/11 and 2015/16. States such as Gujarat, Uttar Pradesh, and Maharashtra account for 70% of the total natural gas sales tax collection during the same period (Figure 5.22). As of 2015/16, natural gas was subsidised for power generation and for consumption in the northeastern region. The total subsidy provided for the consumption of natural gas in the northeastern region amounted to Rs660 crore in 2015/16. The domestic price of natural gas in India ranged from US$4/MMBTU to US$4.5 /MMBTU while its import price was in the range of US$7–US$10/MMBTU (CIF price) during the same period.

Figure 5.21. Trend in Region-wise Collection of Royalty for the Production of Natural Gas



Source: MoPNG (2016a).

Figure 5.22. Trend in the Collection of Sales Tax/VAT for the Sale of Natural Gas

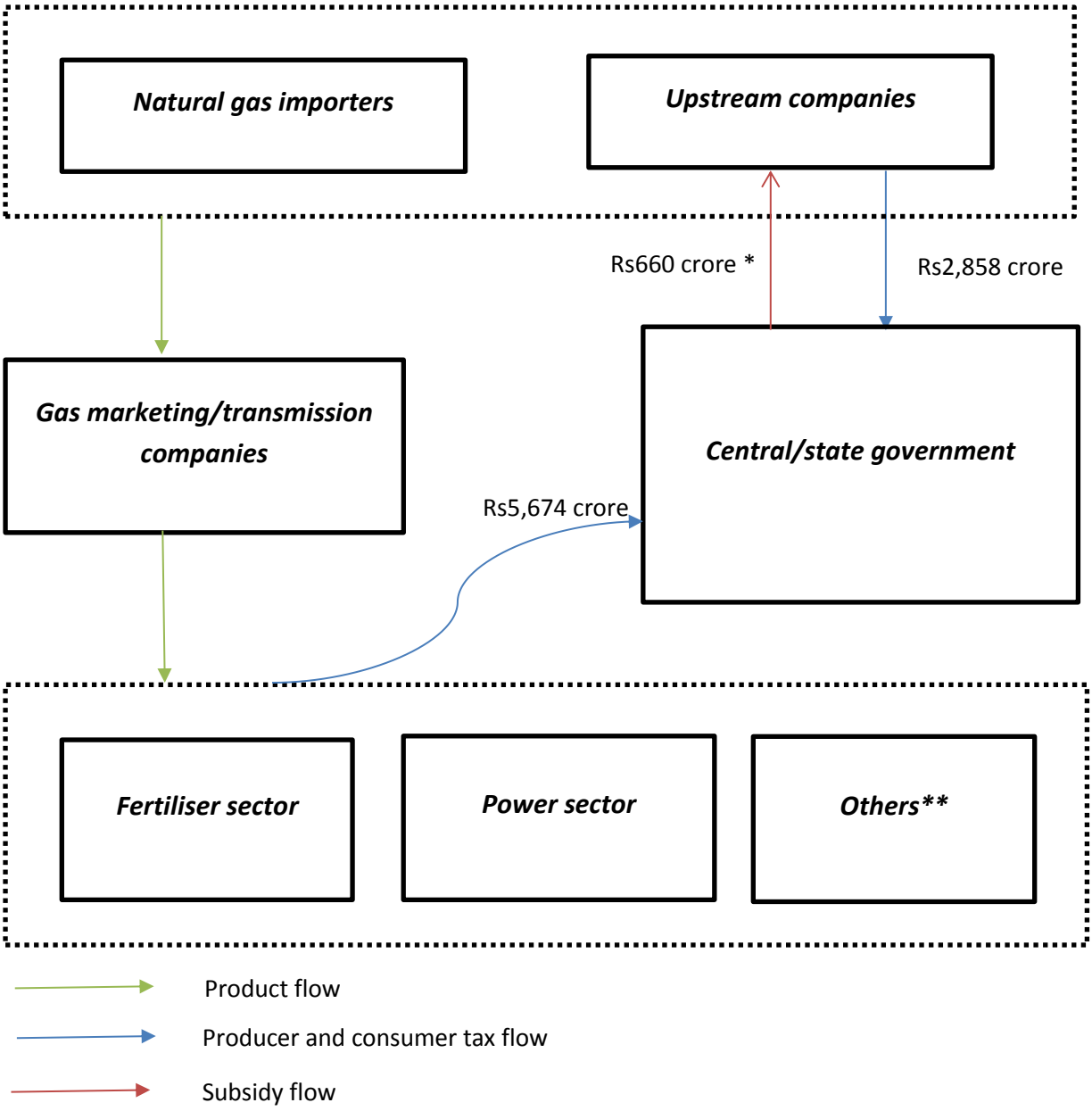


Source: MoPNG (2016a).

Value chain of the natural gas sector in India (Figures in Rs crore)

Figure 5.23 represents the product, tax, and subsidy flows across various entities. In the natural gas segment, the producer taxes contributed by the oil and gas companies to the central exchequer for royalty and customs duties amounted to Rs2,858 crore. The sales tax/VAT contributed to the central and state treasuries on the purchase of natural gas by end consumers for its energy and non-energy purposes amounted Rs5,674 crore in 2015/16. The central government subsidised in 2015/16the price of APM gas in the north-eastern region in the amount of Rs660 crore.

Figure 5.23. Value Chain Diagram for the Natural Gas Segment (Figures in Rs Crore)



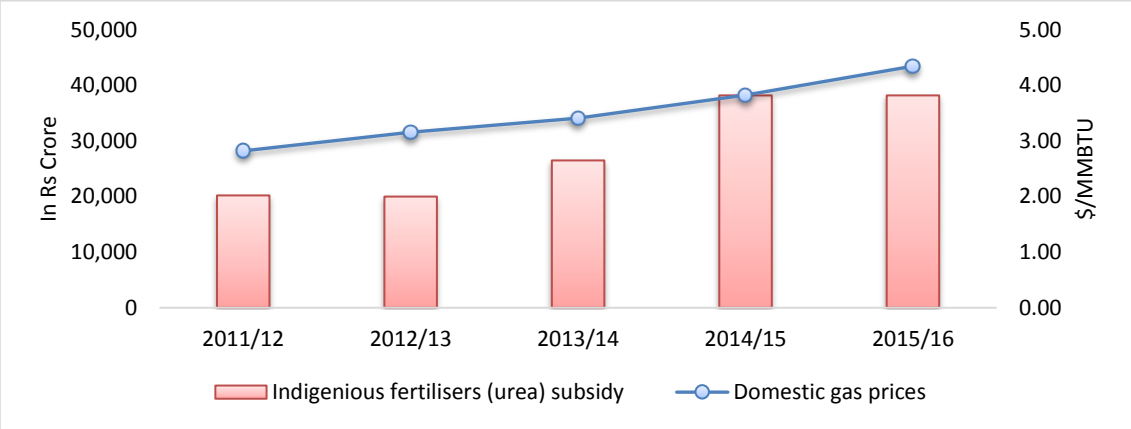
*The value Rs660 crore subsidy is for the sale of APM gas in the north-eastern region.
** Others include the sectors consuming natural gas for energy and non-energy purposes such as refineries/petrochemicals, city gas distribution, industries, tea plantation, sponge iron, etc.
Source: Authors' compilation.

2.5. Fertilisers

Since natural gas is used for the non-energy purpose of producing fertilisers (urea based), it is outside the ambit of this report. However, a huge amount of gas is being consumed in the fertiliser sector (urea based) whose price directly impacts the price of urea which is being subsidised. There is then a need to study the pricing and taxation in the urea fertiliser sector.

In the fertiliser (urea-based) segment in India, the rise in the price of natural gas increases the subsidy burden on the exchequer as the rise in gas price causes fertiliser prices to also rise. For instance, an increase in gas price by Rs1/MMBTU results in the increased production cost of urea by Rs25.99. On average, in India, around 25.99 MMBTU of natural gas is required to produce 1 ton of urea. Hence, the entire impact of increased gas price would be on the subsidy outgo as the market retail price of urea is statutorily controlled. The trend in allocation of indigenous urea subsidy and the domestic natural gas price is shown in Figure 5.24.

Figure 5.24. Trend in the Disbursement of Subsidy in the Fertiliser Sector and in Domestic Gas Prices



Sources: MoPNG (2016a), PPAC (2016c).

Methodology:

The research team, in studying the taxation structure and net tax revenue from the fertiliser sector, chose the state of Gujarat as there is no national aggregate/state-wise data in the public domain on the consumer tax collected from the fertiliser sector for the consumption of natural gas. Also, Gujarat is the second-largest urea-producing state in India and the share of natural gas consumption in the state is at par with the global average of 24%. The team made certain assumptions and adopted a top-down approach to assess the total tax revenue from the fertiliser (urea-based) segment in Gujarat. Table 5.6 shows the components of subsidy and taxation rates for natural gas (in the fertiliser segment) considered under the study for 2015/16.

Table 5.6. Tax and Subsidy Components Considered for Natural Gas Used in Urea-based Fertiliser Plants

Tax and Subsidy Components	Considerations of Natural Gas Used in Urea-based Fertiliser Plants
Customs duty	✓
Service tax	✓
Sales tax/VAT	✓
Central sales tax	✓
Subsidy for the consumption of natural gas in urea-based fertiliser plants	**Nil**

Source: Authors' analysis.

The study team took the following steps to estimate prices:

- Adopted a top-down approach on price build-up to assess the total tax revenue from the segment.
- Took the location of the urea-based fertiliser units in the state of Gujarat and captured the total quantity of urea sold from each fertiliser unit from the domain of the Department of Fertilisers. Also, the actual energy (Gcal/MT) to produce one MT of urea from each fertiliser unit was captured from government documents of the respective ministry (Table 5.7).

Table 5.7. Urea Production from Fertiliser Plants in Gujarat and Their Actual Energy Consumption

Fertiliser Units	Urea Production (MMT)	Actual Energy, Gcal/MT
KRIBHCO, Hazira	22.68	5.64
IFFCO, Kalol	6.01	5.68
GSFC, Vadodara	3.61	6.35
GNVFC, Bharuch	6.91	6.77

Source: Ministry of Chemicals and Fertilizers (2017).

- Based on the actual energy, the total quantity of natural gas required was assessed and the quantity of natural gas supplied was split between domestic and imported gas based on the national supply ratio of 56:44. Since no data on the ratio between long-term and spot/short-term regasified LNG was available, the study team assumed it to be nearly equal.
- The basic price for the imported long-term and spot LNG was the WAP at Dahej LNG terminal situated in Gujarat for 2015/16; in the case of domestic natural gas, it is the average of the government-notified price for the same year.
- The estimated representative price build-up of natural gas from different sources is shown in Table 5.8. The components, such as regasification charge and marketing margin, were identified through literature review and stakeholder interactions. For transportation tariff, the study team assumed that domestic gas is sourced from the nearest offshore fields in Gujarat and Mumbai as the plant-wise gas linkage data is not available in the public domain and the imported gas from the import terminals in

Gujarat is then transported through GAIL/GSPC pipelines. Based on the transmission distance to the fertiliser units and associated notified zonal pipeline tariff, the pipeline tariff for the transmission of natural gas was determined.

- The purchase tax/sales tax/VAT rates notified by the state governments for 2015/16 were considered (Annex II). These assumptions and data were used to arrive at the price build-up of natural gas until the delivery points. Then the total collection of indirect taxes for the consumption of natural gas in the state of Gujarat was assessed.
- The average exchange rate assumed is around Rs65/US$ for 2015/16.

Table 4.8. Representative Price Build-up of Natural Gas from Different Sources for Urea-based Fertiliser Units in Gujarat

Components	Domestic Natural Gas ($/MMBTU)	Long-term RLNG ($/MMBTU)	Spot RLNG ($/MMBTU)
Basic price	4.28	9.50	7.50
Customs duty	0.00	0.49	0.39
Re-gasification charges	0.00	0.65	0.65
Marketing margin	0.09	0.18	0.18
Pipeline tariff	0.34	0.34	0.34
Service tax	0.05	0.05	0.05
Purchase tax/sales tax/VAT	0.56	1.39	1.12
Total delivered cost of natural gas	5.32	12.60	10.22

MMBTU = million metric British thermal unit, RLNG = regasified liquid natural gas, VAT = value added tax.
Source: Authors' compilation.

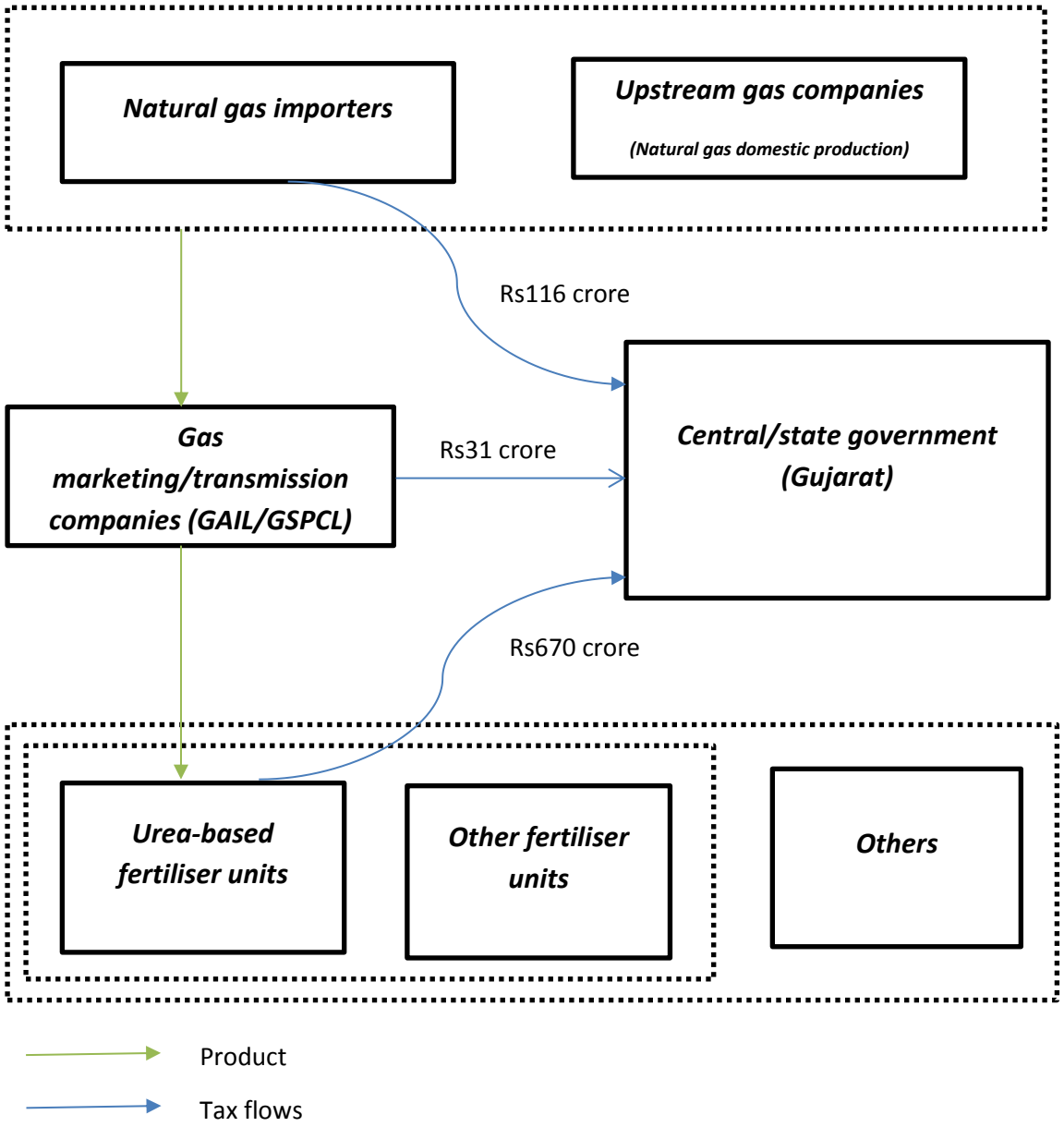
Results:

In 2015/16, the domestic price of natural gas in India ranged from US$4/MMBTU to US$4.5/MMBTU and its import price was US$7/MMBTU to US$10/MMBTU (CIF price). As the natural gas pooling policy was implemented during the period, the deficit in the supply of domestic natural gas was overcome by LNG imports on spot basis. The landed price of natural gas is the key cost component in the total delivered cost as the transportation tariff and other tax levies – such as customs duty, sales tax/VAT, pipeline tariff, and associated service tax – only account for 21%–25% of the total delivered price of natural gas (Table 5.9). The pooled price of natural gas for fertilisers (inclusive of transportation and taxes) ranged from US$8/MMBTU to US$9/MMBTU in 2015/16. Also, in the same year, the total subsidy on indigenous and imported fertilisers (urea based) was about Rs50,500 crore, accounting for almost 19.5% of the total subsidy outgo. Out of this, the subsidy for the indigenous (urea-based) fertilisers was about Rs38,200 crore, which is the second-largest subsidy segment in the country. The study found that approximately 25% of the total VAT collection on the sale of natural gas in the state of Gujarat was for the production of urea in the fertiliser sector.

Value chain diagram for gas consumption in Urea-based fertiliser units in Gujarat (Figures in Rs crore)

Figure 5.25 represents the product and tax flows across various entities. In the fertiliser (urea-based) segment, the producer tax contributed by the natural gas importers and gas transmission companies to the central treasury for customs duties and service tax together amounts to Rs147 crore. The consumer taxes contributed by the gas companies to the state/central treasury for sales tax/VAT, etc. amounted to Rs670 crore in 2015/16.

Figure 5.25. Value Chain Diagram for Urea-based Fertiliser Segment in Gujarat (Figures in Rs Crore)



Source: Authors' compilation.

2.6. Gas-based electricity generation

This section presents the detailed analysis of taxes and subsidies for gas consumption in gas-based power plants in the state of Gujarat and the tax flow to the central government and to the Gujarat government from this segment. In Gujarat, the gas-based power plants with an installed operational capacity of 5.6 GW source gas from the APM; non-APM; KG D6 basin; and imported LNG on spot, long term, and under the e-bid scheme.

Methodology:

The methodology adopted to assess indirect tax collection from the gas-based power plant segment in Gujarat is similar to that of the urea-based fertiliser segment. Gujrat, a representative state, was selected because there is no national aggregate/state-wise data in the public domain on the consumer tax collected by the government for the consumption of natural gas in the power sector. The components of subsidy and taxation rates for natural gas in power plants considered under the study for 2015/16 are shown in Table 5.9.

Table 5.9. Tax and Subsidy Components Considered for the Use of Natural Gas in Power Plants

Tax and Subsidy Components*	Considerations of Natural Gas Used in Power Plants
Customs duty	**Exempted**
Service tax	✓
Sales tax/value added tax	✓
Central sales tax	✓
Subsidy for the for the consumption of natural gas in power plants	✓

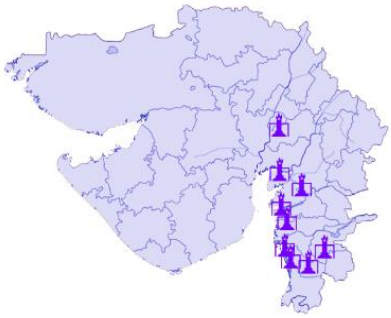
*For the normal procurement for power generation and not under any schemes.
Source: Authors' analysis.

Below are the steps for price estimation:

- A top-down approach on price build-up was used to assess the total tax revenue from the segment.
- The operational gas-based power plants in the state of Gujarat were considered for the study and the quantity of natural gas consumed in each power plant from different sources taken from the CEA fuel consumption division.
- The quantity of natural gas (MMSCM) was converted into energy equivalent (MMBTU) based on the PPAC conversion table. Price build-up for natural gas was made for different energy sources (domestic gas [APM, Krishna-Godavari basin gas, non-APM] and imported gas [spot term, long term, e-bid LNG]) by conducting stakeholder consultations and literature review (Table 6.1).
- WAP at the Dahej LNG terminal situated in Gujarat was taken as the basic price for the imported long-term and spot LNG for 2015/16; in case of domestic natural gas, it is the average of the government-notified price for the same period.

- The components such as regasification charge and marketing margin were captured through literature review and stakeholder interactions. For the transport tariff, domestic gas is assumed to be sourced from the nearest offshore fields in Gujarat and Mumbai as the plant-wise gas linkage data is not available in the public domain and imported gas is sourced from the import terminals in Gujarat and transported through GAIL/GSPC pipelines. Based on the transmission distance to the power plants and associated notified zonal pipeline tariff, the pipeline tariff for the transmission of natural gas was determined.
- The purchase tax/sales tax/VAT rates notified by the state governments for 2015/16 were considered for 2015/16 (Annex II).These assumptions and data were used to arrive at the price build-up until the delivery point and thereby estimate the total indirect tax collection for the consumption of natural gas in Gujarat.
- The average exchange rate assumed was around Rs65/US$ for 2015/16.

Figure 5.26. Map of Gas based Power Plants in Gujarat



Source: Government of Gujarat (2018).

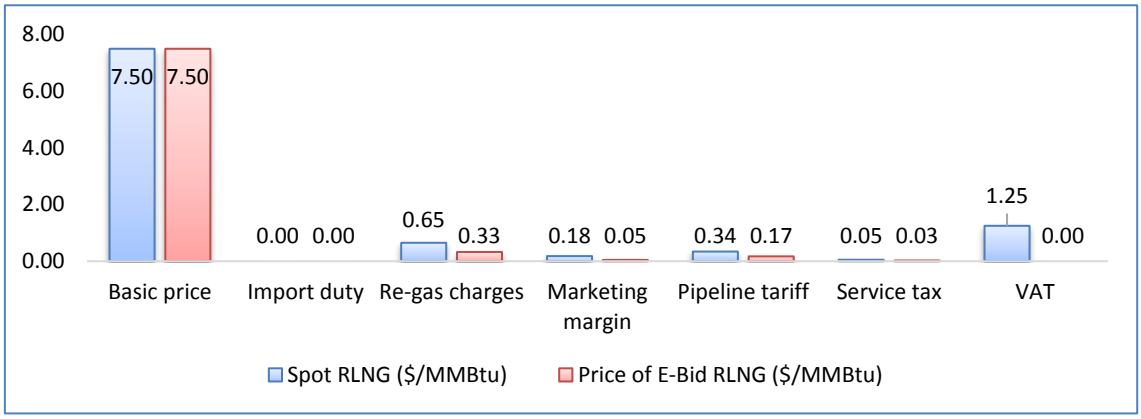
Table 5.10. Representative Price Build-up of Natural Gas from Different Sources for Gas-based Power Plants in Gujarat

Components	Domestic Natural Gas ($/MMBTU)	Long-term RLNG ($/MMBTU)	Spot RLNG ($/MMBTU)	Price of e-Bid RLNG ($/MMBTU)
Basic price	4.28	9.50	7.50	7.50
Customs duty	0.00	0.00	0.00	0.00
Regasification charges	0.00	0.65	0.65	0.33
Marketing margin	0.09	0.18	0.18	0.05
Pipeline tariff	0.34	0.34	0.34	0.17
Service tax	0.05	0.05	0.05	0.03
Purchase tax/ Sales tax/value added tax	0.66	1.55	1.25	0.00
Total delivered cost of natural gas	5.42	12.27	9.97	8.07

RLNG = regasified liquefied natural gas.
Source: Authors' compilation.

Figure 5.27 compares the tax elements within the delivered cost of gas from spot and e-bid LNG.

Figure 5.27. Comparison between the Price Elements of Spot LNG and e-Bid LNG under the Scheme



MMBTU = million metric British thermal unit. RLNG = regasified liquefied natural gas, VAT = value added tax.
Source: Authors' compilation.

Results:

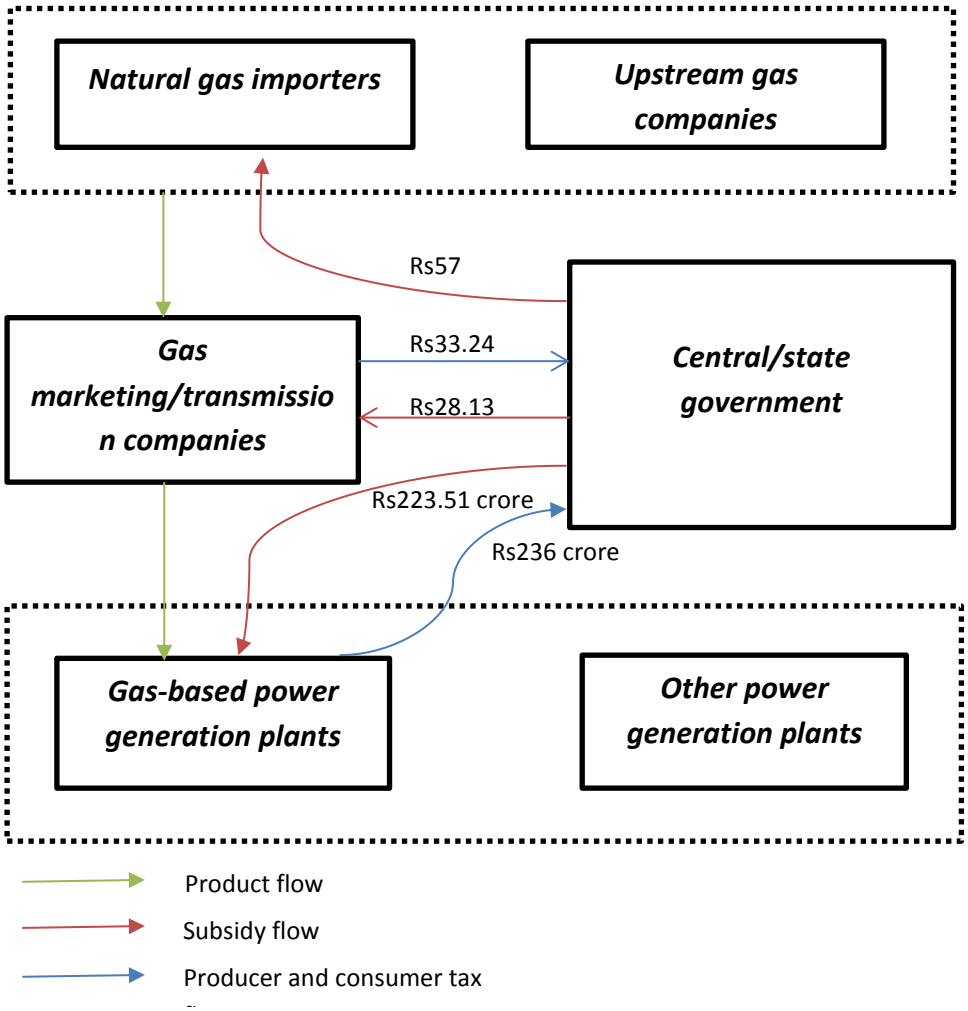
In 2015/16, the domestic price of natural gas in India ranged from US$4/MMBTU to US$4.5/MMBTU, and the import prices of natural gas was in the range of US$7/MMBTU–US$10 /MMBTU (CIF price). The landed price of gas is the key component of total delivered cost as transport tariff and other tax levies – such as customs duty, sales tax/VAT, pipeline tariff, and associated service tax – only account to about 21%–25% of the total delivered price of natural gas. Under the e-bid subsidy scheme, the share of cost components other than the basic price altogether accounts for only 7.2% of the total delivered cost of e-bid LNG, which effectively reduced the delivered cost by 20% (~2 Rs/MMBTU). The government provided 5.13 MMSCMD of subsidised natural gas through LNG spot imports under the reverse e-bid scheme CEA (2016b).

According to TERI's estimate, the subsidy estimated at Rs300 crore was disbursed for stressed/stranded gas-based power plants in Gujarat. This amount converts to a subsidy of almost Rs1.5 for unit generation from gas-based power plants in Gujarat. The government has foregone about Rs223 crore from its tax revenue for the sale of natural gas. On the other hand, in Gujarat, the consumer tax collected on account of natural gas sales for power generation accounted for Rs270 crore. The contribution of sales tax/VAT collected from the sale of natural gas to power generation plants out of the total sales tax/VAT collected from the sale of natural gas in the state was almost 11%. The value chain diagram for gas-based power generation in Gujarat is shown in the next section.

Value chain diagram for the gas consumption for power generation in Gujarat (Figures in Rs crore)

Figure 5.28 represents product and tax flows across various entities in Gujarat. In the gas-based power segment, the consumer taxes contributed by the gas companies to the state/central exchequer from the sales tax/VAT, etc. amounted to about Rs236 crore in 2015/16. The subsidy from the central government and the Gujarat state government to the power sector for the consumption of natural gas under the scheme amounted to approximately Rs384 crore in 2015/16, out of which the tax foregone amounted to around Rs304 crore.

Figure 5.28. Value Chain Diagram for Gas Consumption for Power Generation in Gujarat (Figures in Rs Crore)



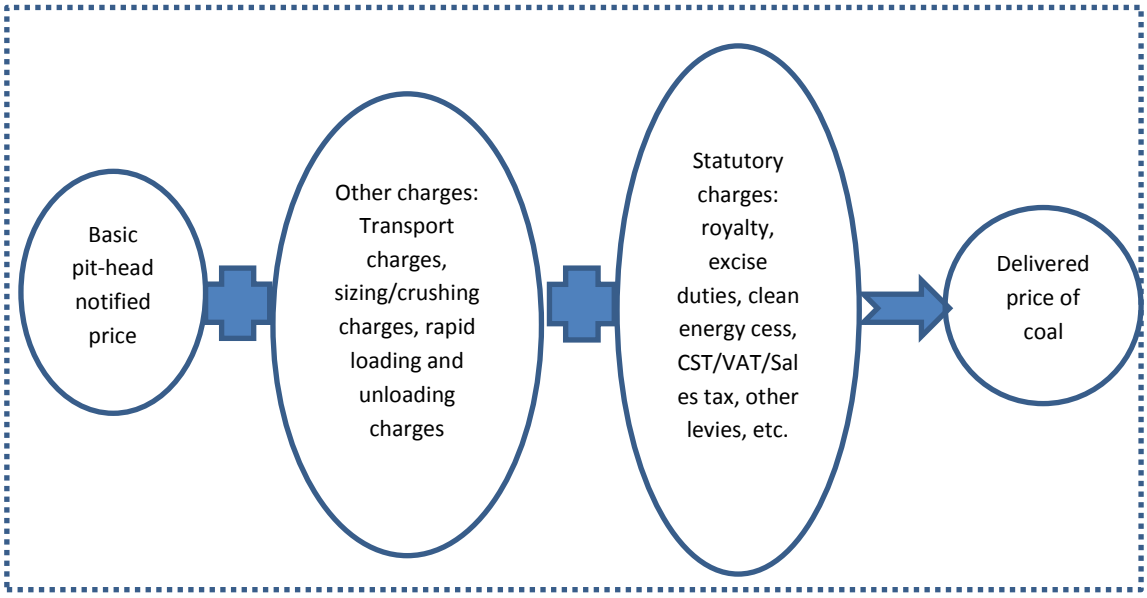
Source: Authors' compilation.

Chapter 6

Taxes and Subsidies in the Coal Sector

The price of coal paid at the time of purchase is a build-up of several company-imposed and government-set statutory charges. The basic coal pricing equation is shown in Figure 6.1.

Figure 6.1. Coal Pricing Equation



CST = central sales tax, VAT = value added tax.
Source: Authors' compilation.

A glance into the structure of coal price clarifies various components that make up the final landed price of coal paid by the consuming sector. Taking the case of power utilities, the price break-up (additions to basic price of coal) is as follows[9]:

Company Charges:

Sizing charges are levied by the coal company for the classification of coal as per the size requirements enumerated as follows:

- CIL charges Rs51/ton for the top size range of 200–250 mm; Rs79/tone for top size limited to 100 mm; and Rs100/ton for top size limited to 50 mm.
- The SCCL charges Rs60/ton for the top size range of 200–250 mm.
- Surface transport costs are collected by the company for the transport of coal from the pithead to the loading points.

[9] The charges mentioned in this section are subject to regular revisions per government policies. The reported figures are as of March 2015.

- CIL charges Rs20/ton for loading coal into the Indian Railways system or into the purchaser's own transport through a high-capacity loading system. For a distance of 3–10 km, it charges Rs44/ton, and Rs77/ton for a distance of 10–20 km beyond which the purchaser bears the transport charges.
- The SCCL charges Rs17/ton for up to a distance of 3 km; Rs57/ton for a distance of 3–10 km, and Rs116/ton for a range of 10–20 km, beyond which Rs3.6/km is charged.
- Fuel surcharge is charged by the company to account for increase in diesel prices.
- Pre-weigh bin charges at Rs25/ton are levied on all road and rail dispatch points, where coal is delivered by the company through pre-weighed bins.
- Additional costs applicable to the concerned dispatch points and grades such as lifting charges, additional transport cost, guarantee, sampling, facility, and any other additional costs are charged as per the terms and conditions of the Fuel Supply Agreement and memorandum of understanding with the coal buyers.

Railway charges:

- The Indian Railways charges basic railway freight for coal transportation from loading points/sidings to unloading points/sidings (Annex III).
- Dynamic pricing charge is levied by the Indian Railways at 15% of railway freight for peak and non-peak seasons, premium and non-premium services, and for busy and non-busy routes.
- Development surcharge is charged at 5% of basic railway freight and dynamic pricing charge for special railway safety.

Government levies:

- The state government levies mining companies a royalty charge of 14% for extraction and use of coal (Ministry of Mines, 2013). All coal mining states charge this rate, except West Bengal that charges a lower royalty rate of Rs6.5/ton to Rs2.5/ton but collects an additional cess of 25%/ton of coal produced (Ministry of Coal, 2012).
- Customs duty in the case of imported coal for power generation purposes is levied at 4.5%.
- In 2015/16, the central government levied a clean energy cess of Rs200/ton[10] on mining companies to reduce the environmental consequences (Ministry of Coal, 2017).
- The central government levies a stowing excise duty of Rs10/ton on the total raw coal dispatched as well as for the rehabilitation, stowing, and infrastructure development of abandoned mines (Ministry of Coal, 2017).
- A forestland adjustment charge is levied at Rs15/ton for the value of forestland that is cleared for mining.
- Forest permit fee is levied at Rs10/ ton use of forestland for mining.
- Central excise duty at 6.18% is levied on the transaction value of coal (Ministry of Coal, 2017).

[10] Currently, the clean energy cess is Rs400/ton.

- Value added t-x (VAT) is levied on the sale of coal at 5% of the sale value (on intra-state sale for power generating stations) and CST is levied at 2% (inter-state sale).
- A service tax is levied at 3.708% of railway freight, dynamic pricing charge, and development surcharge as a levy for transportation services (Ministry of Coal, 2017).

Box 4. Royalty Rate on Coal

The royalty rates across the states are fixed as per the following formula:

$$R = a + bP$$

Where, R = Royalty (rupees per ton

a = Specific (fixed) component (rupees per ton)

b = Ad valorem (variable) component (rate of royalty)

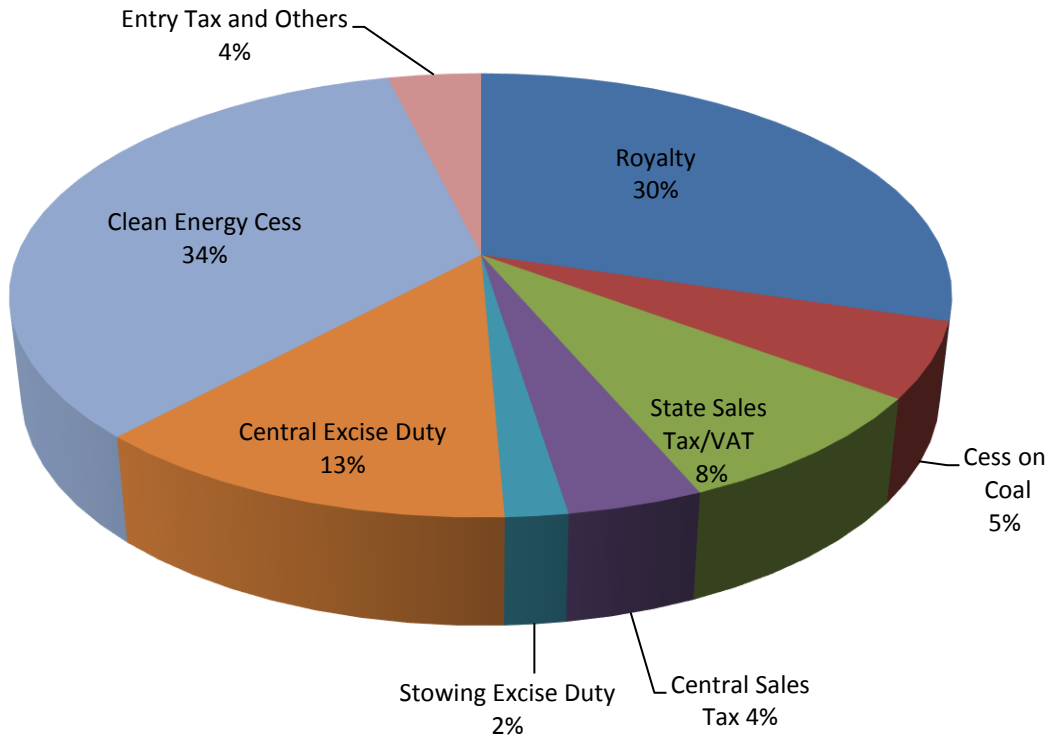
P = Price of coal (rupees per ton)

With the latest revision of royalty rates in 2012, the rate of royalty is applicable on coal in all states except West Bengal, eclipsing taxes and levies, and other charges. In case of West Bengal, apart from the small amount of royalty, the state government levies its own cess as a cost for land exploitation that is limited to the overall revenue that yields from the formula (Ministry of Coal, 2014).

1. Analysis of Taxes and Subsidies

In India, CIL holds the lion's share in coal production, especially for power generation. For 2015/16, CIL contributed a total of Rs29,084 crore towards taxes and duties, out of which the major tax component accounting for about 34% of total indirect tax revenue was clean energy cess (Rs9,980 crore). Effective 1 March 2016, the clean energy cess was raised from Rs200/ton to Rs400/ton. The royalty on coal production is charged 14% on the base rate of coal except in West Bengal where the state charges a lower royalty of Rs2.5/ton and Rs6.5/–ton according to the different grades of coal and imposes an additional cess of 25% on coal production. The total royalty collection from the account of CIL amounted to Rs8,209 crore and the additional cess accounted for Rs1,591 crore in 2015/16. The total indirect tax and duty collection on account of production and sale of coal by CIL are shown in Figure 6.2.

Figure 6.2. Contribution of Tax Revenue to the Government from Coal India Ltd



Source: CIL (2016).

1.1. Coal-based power generation

This section presents the analysis of taxes on and subsidies for the consumption of non-coking coal in electricity generation for the representative state of Gujarat. The methodology and assumptions adopted for the study are detailed below.

Methodology

The research team chose Gujarat as a representative state to study the taxation structure and net tax revenue collected by the government for coal consumption in power plants. .Gujarat was considered for gas-based power generation and due to the complexity in calculating state-wise and plant-wise tax collection since coal-based power plants are scattered across the country.

Grade-wise and plant-wise coal (domestic and imported) consumption data and respective coal linkages to power plants were required in order to arrive at coal's basic price and railway freight charges. Since these data for all plants across states were unavailable in the public domain, the state sector coal-based power generation units were considered for the study assuming that the domestic coal linkage is from the nearest mine in Jharkhand. The components of subsidy and taxation rates for coal considered under the study for 2015/16 are shown in Table 6.2.

Table 6.1. Tax and Subsidy Components Considered for Coal Consumption in Power Plants

Tax and Subsidy Components	Considerations of Coal for Consumption in Power Plants
Royalty	✓
Clean energy cess	✓
Stowing excise duty	✓
Customs duty	✓
Basic railway freight	✓
Dynamic pricing charge	✓
Development surcharge	✓
Service tax	✓
Sales tax/VAT	✓
CST	✓
Subsidy on coal consumption	Nil

CST = central sales tax, VAT = value added tax.
Source: Authors' analysis.

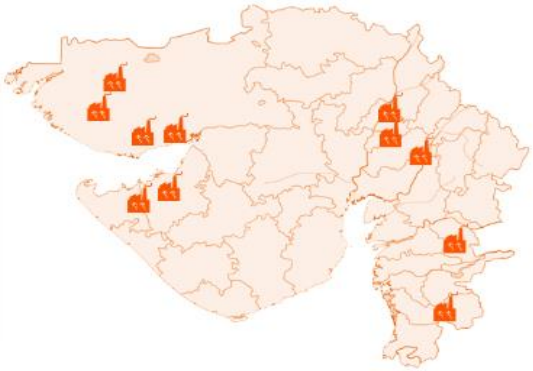
The steps for the estimation are described below:

- A bottom-up price approach on price build-up was carried to assess the total tax revenue from the segment.
- The state sector coal-based power plants in Gujarat were considered under the study and the plant-wise, grade-wise, and category-wise (domestic, washed, imported) coal composition, electricity generation, and station-wise heat rate data were accessed from government documents of the Gujarat State Electricity Regulatory Commission. Also, the corresponding delivered cost of coal based on the grade, category (domestic, imported) was accessed from the same domain.
- The station heat rate and the gross electricity generation were used to arrive at the total energy required. The weighted average grade of domestic and imported coal data received was used to arrive at the category-wise (domestic, imported) coal consumption.
- For domestic coal, the location of coal-based stations were considered (Figure 6.4) to assess their distance from the nearest mine. In case of imported coal, the distance between nearby coal handling ports and power stations were assessed.
- Since all the plants are non-pithead, the notified rate of railway freight based on distance was used to arrive at the basic freight charge for each power station considering the respective distance based on categories. The applicable rate of railway freight is shown in Annex III.
- The notified tax rates associated with coal production, marketing, and railways were also considered in developing the price build-up, which was described in the previous

section. The price build-up of coal (category-wise) to each state-owned coal-based power plant was made and the total indirect tax collection for coal consumption in the state of Gujarat was assessed.

The coal-based power plants in Gujarat generally consume the domestic non-coking coal graded between G9 and G13, some washery grades, and imported coal. The share of taxes per ton of domestic coal is shown in Figure 6.5. A representative price build-up for both domestic and imported coal to the Gandhinagar thermal power plant is shown in Annexes VII and VIII.

Figure 6.3. Map of Thermal Power Plants in Gujarat

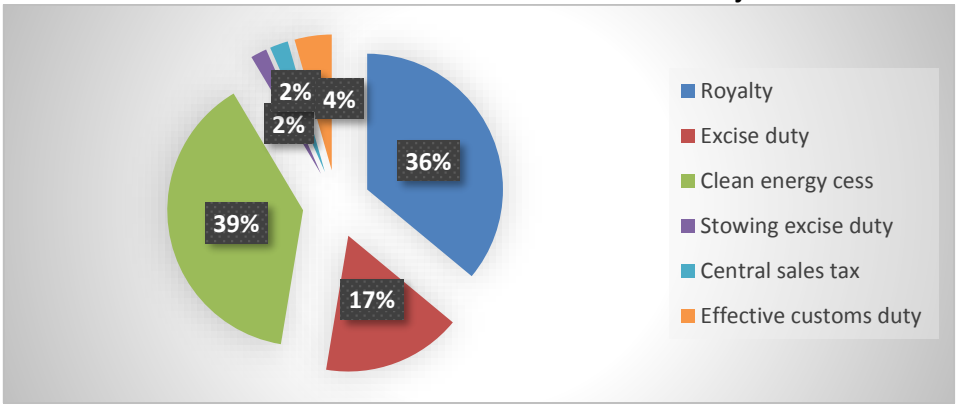


Source: Government of Gujarat (2018).

Results:

In 2015/16, the government collected Rs1,317 crore from coal sales and transportation for the power generation in state sector coal-based power plants located in Gujarat. Out of the total tax collection from the state o-ned coal-based power plants in Gujarat (excluding transportation), producer taxes such as royalty, clean energy cess, and excise duty accounted for about 90% of the tax revenue to the government and consumer taxes such as central sales tax/VAT accounted for 2% only (Figure 6.5).

Figure 6.4. Contribution of Domestic Coal Taxes for the Consumption of State-Owned Coal-based Power Plants in Gujarat



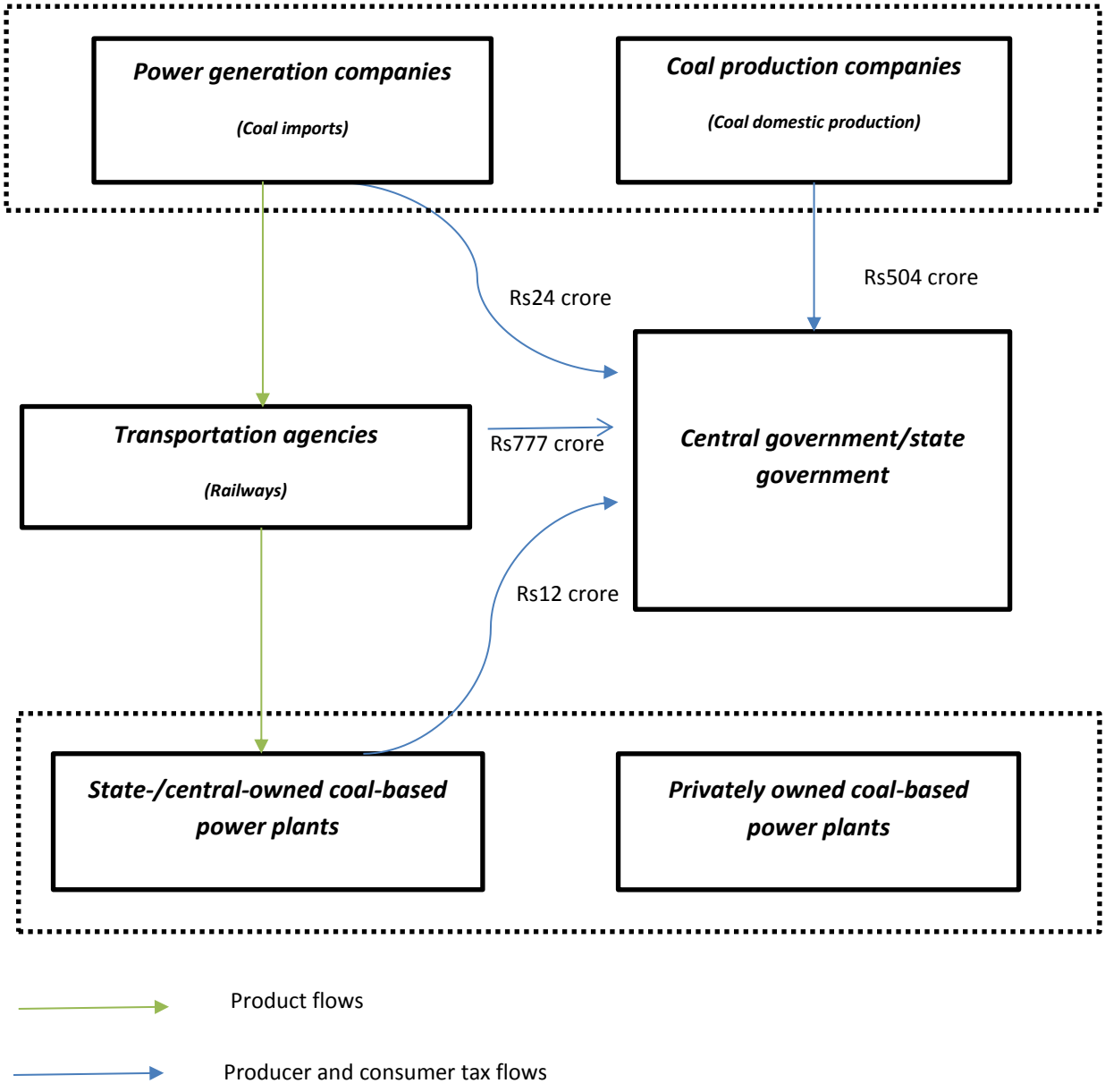
Source: Authors' estimation, Gujarat State Electricity Regulatory Commission (2016).

The collection of clean energy cess was the major tax contributing about 39% to the government revenue from these power plants. Out of the total delivered price of domestic coal at Gujarat power stations, the railway freight accounted for 45%–62%, depending on the distance from the pithead. In case of imported coal, the share of transportation cost per ton is only in the range of 9% to 20% for the power plants in the state of Gujarat. In 2015/16, the Indian Railways paid almost Rs777 crore to the government on account of transportation of coal to these power plants.

Value chain diagram for the coal use in power generation in Gujarat (Figures in Rs crore)

Figure 6.5 represents the product and tax flows across various entities for the coal used in power generation in Gujarat. In the coal-based power segment, producer taxes contributed by the coal production companies and the Indian Railways to the central exchequer through royalties, customs duties, stowing excise duty, service tax, etc. amounted to Rs1,305 crore; the consumer taxes contributed by the power generation companies to the state and central treasuries on the account of sales tax/VAT, CST etc. amounted to about Rs12 crore in 2015/16.

Figure 6.5. Value Chain Diagram for Coal Consumption of Power Plants in Gujarat (Figures in Rs Crore)



Source: Authors' compilation.

Table 6.2. Summary of the Segmental Analysis on Taxes and Subsidies for 2015/16

Segments	Taxes	Subsidies
Crude oil	• The share of tax components in a barrel of crude oil varies in the range of 23% to 28% out of which OID cess and royalty constitute 14% and 7%–11%, respectively, for 2015/16. • The oil industry development cess and national calamity contingent duty collections, which are on fixed rate basis at Rs4,500/MT and Rs50/MT, respectively, do not get influenced by the fluctuations of global crude oil prices. These fixed rate-based levies at low crude oil prices burden the oil producers. • The state of Maharashtra collected the highest sales tax at 54% of the total sales tax payment for crude oil, followed by Assam at 22% and Gujarat at 21% in FY 2015/16	• No subsidy
Subsidised domestic Liquefied petroleum gas (LPG)	• The excise and the customs duties are exempted for the domestic LPG segment. Therefore, the only taxes are sales tax/VAT and state-specific cost. • The sales tax/VAT on domestic LPG (Subsidised) varies in the range of 0%–5% from state to state. • The sales tax/VAT from the domestic subsidised LPG segment contributed approximately Rs1,347 crore to the state governments, which accounts for about 0.9% of the total petroleum products sales tax collection during 2015/16.	• In 2015/16, the Government of India implemented the direct benefit transfer for LPG across the states. • The total subsidy amounted to Rs16,074 crore, out of which Rs18 crore was absorbed by the OMCs into their balance sheets and the remaining was paid by the central government. • In addition to the OMCs' share in the total LPG subsidy recorded, they absorbed around Rs4,913 crore in the form of uncompensated costs without passing to the consumers as per the DBTL (PAHAL) scheme.
PDS Kerosene	• Not computed	• In 2015/16, under-recovery by the oil companies amounted to Rs11,496 crore, where the upstream oil companies shared a burden of Rs 1,251 crore and the remaining was paid by the central government.

Segments	Taxes	Subsidies
Natural gas	• In 2015/16, owing to the decline in natural gas prices and lower production, producer taxes, such as royalty collection, dropped by 26% to Rs2,858 crore from Rs3,874 crore in 2014/15. • Consumer tax collection from the natural gas sector is about Rs5,674 crore, almost double than the producer tax collection. • The sales tax/VAT rates for the consumption of natural gas vary from 0% to 25% from state to state. • The total sales tax collection from the natural gas sector increased at a CAGR of 6.7% between 2010/11 and 2015/16. • States such as Gujarat, Uttar Pradesh, and Maharashtra account for 70% of the total natural gas sales tax collection.	• During 2015/16, the central government subsidised Rs660 crore for the consumption of APM gas in the northeastern region. • Other than the subsidy in the north-eastern region, the consumption of natural gas is subsidised to stressed/stranded gas-based power plants as part of the central government's revival scheme.
Natural gas consumption in urea-based fertiliser sector	• The state of Gujarat was considered for the study due to limitations in data availability. • The pooled price of natural gas for fertilisers (inclusive of transportation and taxes) was US$8–US$9/MMBTU in 2015/16. • The study found that the contribution of total sales tax/VAT on the sale of natural gas for consumption in the fertiliser sector for the production of urea in Gujarat was about 25% of the total sales tax/VAT collection.	• No subsidy for consumption of natural gas in the urea sector.
Natural gas consumption in power sector	• A representative state Gujarat is considered for the study due to limited availability of data. • Under the e-bid subsidy scheme, the share of cost components other than the basic price altogether accounts for only 7.2% of the total delivered cost of e-bid LNG, which effectively reduced the delivered cost by 20% (~2 Rs/MMBTU). • The contribution of sales tax/VAT collected for the sale of natural gas to power generation plants was almost 11% of the total sales tax/VAT collected on the sale of natural gas in the state.	• For fiscal year 2015/16, as per the scheme for the use of gas-based power generation capacity, outlay of the support from the Power System Development Fund had been fixed at Rs3,500 crore. • According to the estimate, a subsidy of approximately Rs300 crore was disbursed for stressed/stranded gas-based power plants in Gujarat. This converts to a subsidy of almost Rs1.5/kWh for unit electricity generation from gas-based power plants in Gujarat.

Segments	Taxes	Subsidies
Coal	• During 2015/16, CIL contributed a total of Rs29,084 crore towards taxes and duties. • The major tax component accounting for about 34% of total indirect tax revenue was clean energy cess (Rs9,980 crore), followed by a royalty collection of 30% (Rs8,209 crore).	• No subsidy
Coal consumption for power generation	• The state sector coal-based power plants in Gujarat is considered for the study due to limitations in data availability. • Out of the total tax collection from the state sector coal-based power plants in Gujarat (excluding transportation), producer taxes such as royalty, clean energy cess, and excise duty accounted for about 90% of the tax revenue to the government and the consumer taxes such as central sales tax/VAT accounted for 2%. • Clean energy cess was the major tax contributing about 39% to the government revenue from these power plants. • In the total delivered price of domestic coal at the Gujarat power stations, the railway freight accounted for 45%–62%, and in case of imported coal, the share was only 9%–20%.	• No subsidy

CIL = Coal India Ltd, MMBTU = million metric British thermal unit, OID = oil industry development , VAT = value added tax.
Source: Authors' analysis.

Chapter 7

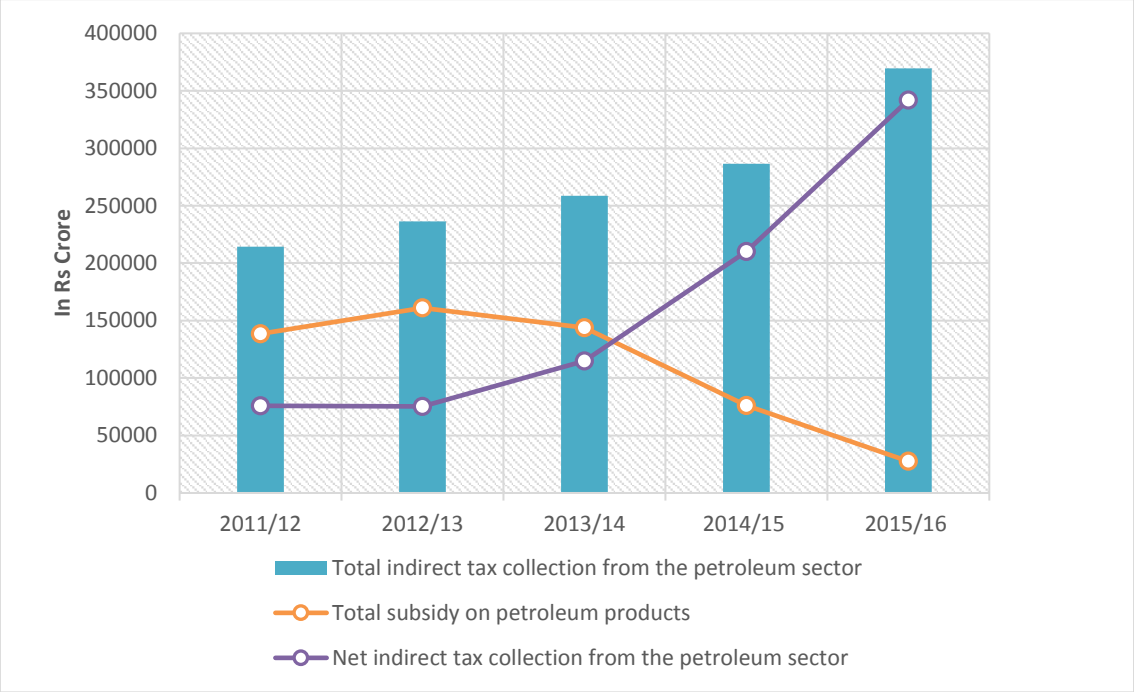
Conclusions and Recommendations

The government has historically determined the prices of energy products and services in view of socio-economic considerations such as providing universal energy access at affordable prices, meeting energy demand efficiently, ensuring greater sustainability, and supporting economic growth. Energy subsidies often act as policy tools for meeting these objectives, but do not always deliver against them and require scrutiny. Otherwise, they could create distortions to the energy industry and possibly to the economy**.** Distorted markets provide incorrect market signals, affect the level of competition, and lead to inefficient allocation of resources.

Over the years, the GoI has taken various steps in progressively moving away from energy subsidy and in rationalising energy pricing to reduce subsidy and its negative implications. Most importantly, the government has implemented various reforms such as DBTL in the oil and gas sector to allocate resources efficiently, duly eliminating duplicate and bogus LPG beneficiaries and preventing leakage into the secondary market. However, there has been a progressive albeit incomplete rationalisation of energy pricing to reduce the subsidy and distortion, particularly in the domestic LPG and PDS kerosene segments. Once allocated the subsidies tend to become entrenched and do not get revised based on indicators like capacity to pay (inflation indexation, wage indexation, GDP/capita indexation).

The petroleum sector is a major contributor to government's fiscal revenues, contributing 23% of indirect tax collection. The progressive rationalisation in the oil and gas sector, along with lowered crude oil prices, led to an increased net indirect tax revenue by 61.5% between 2012/13 and 2015/16, from 31% net indirect tax revenue in 2012/13 when the crude oil price averaged at US$108/bbl to 92.5% in 2015/16 when it fell and averaged at US$46/bbl (Figure 7.1). The share of under-recoveries out of the total indirect tax revenue from the petroleum sector also declined by 65% between 2012/13 and 2015/16, from 68% in 2012/13 to just 3% in 2015/16 under the prevailing crude oil prices which significantly reduced the impact on oil companies in realising their cash flows in a timely manner. The extent of subsidy provided under the budget of the GoI in the oil and gas sector also decreased by almost 20% out of the total petroleum subsidy budgeted between 2011/12 to 2015/16.

Figure 7.1. Trend in Net Indirect Tax Collection from the Petroleum Sector



Source: Authors' compilation.

In short, data shows that between 2012/13 and 2015/16, the increased demand for petroleum products and rationalised subsidies altogether improved the indirect tax collection in a favouring environment of low crude oil prices.

On the natural gas side, the key issues and challenges for sectoral development were pricing, infrastructure development, and domestic gas availability. The supply infrastructures such as natural gas pipelines and LNG import terminals were mature only in certain parts of the country, which led to a skewed consumption. Also, the decline in production of cheap domestic gas and delays and lack of new developments led to increased dependency on imported LNG over the years. The natural gas price indexed to the crude oil price for the Asian region is another challenging factor making the gas price in Asia higher than European and United States. The fluctuation in international crude oil prices impacted the landed price of natural gas, which is the major cost component in the delivered price of gas. Also, the sales tax/VAT varying from 0% to 25% from state to state led to an increase in the delivered price of natural gas in many states. These factors resulted in the constrained supply of natural gas, led to the creation of stranded/stressed assets, loss of revenue for value chain entities, lack of new investments in the sector, uncertainty in demand and un-competitiveness within the sector, thus requiring new policy intervention. The aforementioned factors were evident from the spatially distributed consumption of natural gas in India, along with the variation in state-wise indirect tax collection.

In the coal sector, major indirect tax components are clean energy cess and royalty, which accounted for nearly 65% of the total indirect tax collection in 2015/16. Over the past decades, coal continued to be the dominant source of energy for generating power, but coal prices are determined by CIL and are indirectly subsidised by pricing it lower in regulated sectors such as power and fertilisers compared to unregulated sectors such as industries. A lot of questions exist regarding the rationale of providing implicit subsidy on the consumption of coal in the regulated sector. To address the same, further study is required to determine the options for reform regarding coal subsidies and taxes and their distortionary impacts on different sections of the society while ensuring affordability in the electricity produced.

In many of these segments under the study, the study team experienced a lot of challenges in data collection especially in the plant-wise, grade-wise consumption of coal, coal linkage data to each power plant, mode of dispatch data from coal mines, etc. which limited the scope of research in these areas.

This study led to the following high-level recommendations:

- Subsidies should be revised based on indicators such as capacity to pay (inflation indexation, wage indexation, GDP/capita indexation) duly taking note of the socio-economic development in a developing country like India.
- As natural gas is a modern, cleaner and 'bridge' fuel for clean energy transition, it should be preferentially taxed and the landed price rationalised based on regional gas-to-gas competition which requires international cooperation between countries to facilitate the development of a natural gas hub. Government also needs to give adequate support for the development of infrastructure in the country in a timely manner.
- A centralised portal for energy data management, with data inputs from national and state agencies, should be set up for proper analysis and decision making.

References

Bandyopadhyay, K.R. (2009), *Petroleum Pricing in India: Transition from APM to MDPM.* New Delhi: Asian Institute of Transport Development.

Central Electricity Authority (CEA) (2016a), 'Installed Capacity' Retrieved from CEA Archives: http://www.cea.nic.in/monthlyarchive.html

Central Electricity Authority (CEA) (2016b), 'Fuel Reports', Retrieved from CEA Archives: http://www.cea.nic.in/fuelreports.html

Cabinet Committee on Economic Affairs (2015), 'Pooling of Gas in Fertilizer (Urea) Sector'. Retrieved from PIB: http://pib.nic.in/newsite/PrintRelease.aspx?relid=117888

Coal India Ltd (CIL) (2016), *Annual Report.* New Delhi: CIL.

Coal India Ltd (CIL) (2018)', *Coal Vision 2030.* New Delhi: CIL.

Coal Consumers Association of India (CCAI) (2013), *CCAI.* Retrieved from Circulars and Policies: http://www.ccai.co.in/circular-policies/cil/06.pdf

Deloitte (2016), *Oil and Gas Taxation in India.* Mumbai: Deloitte.

Department of Fertilizers (2016), *Standing Committee for Chemicals and Fertilizers.* New Delhi: Lok Sabha Secretariat.

Ministry of Chemicals and Fertilizers (2017), Annual Report 2016-2017. Downloadable at http://fert.nic.in/sites/default/files/Annual_Report_2017-2018.PDF, Accessed date 5 August 2019.

Directorate General of Hydrocarbons (DGH) (2015), *Hydrocarbon Exploration and Production Activities India 2014–15.* New Delhi: DGH.

EY (2015), *Global Oil and Gas Tax Guide.* Gurgaon, Haryana: EY.

Government of Gujarat (2018), 'Energy and Petrochemicals Department', Retrieved from https://guj-epd.gujarat.gov.in/

Gujarat State Electricity Regulatory Commission (2016), 'Tariff order 2017', Retrieved from http://www.gercin.org/uploaded/document/edb78b56-055e-400a-9667-8d7d6e49e60e.pdf

IISD (2016), *Reforming Kerosene Subsidies in India: Towards Better Alternatives.* Winnipeg: IISD.

India Chamber of Commerce (2018), 'Oil and Gas', Retrieved from Indian Chamber of Commerce: https://www.indianchamber.org/sectors/oil-and-gas-sector/

Indian Railways (2015), 'Freight Rate Circulars', 1 April, Retrieved from http://www.indianrailways.gov.in/railwayboard/view_section_new.jsp?lang=0&id=0,1,304,366,555,765,1538

Indian Oil Corporation Ltd (IOCL) (2015), 'Price Build-up Sensitive Products', Retrieved from https://www.iocl.com/products/PP_9_PriceBuildupSensitiveProducts.pdf

Ministry of Coal (2012), 'PRS', 16 May, Retrieved from Coal.nic.in: https://coal.nic.in/sites/upload_files/coal/files/curentnotices/180512_0_2.pdf

Kirit Parikh Committee (2013), Retrieved from https://currentaffairs.gktoday.in/kirit-parikh-committee-suggests-increase-prices-diesel-kerosene-lpg-1120139587.html. Accessed date 5 August 2019.

Ministry of Coal (2014), Study Group to Consider Revision of Rates of Royalty on Coal. India Enviornmental Portal.

Ministry of Coal (2017), Post GST Reduction of Incidence of Tax on Coal Consumers. New Delhi: PIB.

Ministry of Finance (2017), *Indian Public Finance Statistics.* New Delhi: Government of India.

Ministry of Mines (2013), Revision of Royalty Rates of Minerals. New Delhi: Press Information Bureau, Government of India.

Ministry of Petroleum and Natural Gas (MoPNG) (2014a), *Report of the Committee on Gas Pricing.* New Delhi: Government of India.

Ministry of Petroleum and Natural Gas (MoPNG) (2014b), *New Domestic Natural Gas Pricing Guidelines, No. 22013/27/2012.* New Delhi: Government of India.

Ministry of Petroleum and Natural Gas (MoPNG) (2016a), *PNG Statistics.* New Delhi: Government of India.

Ministry of Petroleum and Natural Gas (MoPNG) (2016b), *Annual Report.* New Delhi: Government of India.

Ministry of Power (MoP) (2015), 'Scheme for Utilization for Gas Based Power Generation Capacity', 27 March, Retrieved from MSTC Ltd: https://www.mstcecommerce.com/auctionhome/psdf/RenderFilepsdf.jsp?file=Scheme-PSDF-dated-31-03-2015.pdf

Ministry of Power (MoP) (2017), 'Power Sector at a Glance'. Retrieved from Ministry of Power: https://powermin.nic.in/en/content/power-sector-glance-all-india

Ministry of Statistics and Program Implementation (MOSPI) (2017), Annual Report 2016–2017. Downloaded at http://mospi.nic.in/sites/default/files/publication_reports/mospi_Annual_Report_2016-17.pdf?download=1, Accessed 5 August 2019.

Ministry of Statistics and Program Implementation (2017a), *Energy Statistics.* New Delhi: Government of India.

Niti Aayog (2017), Draft National Energy Policy, New Delhi.

Oil Industry Development Board (OIDB) (2016), *Annual Report*. New Delhi: OIDB.

Open Government Data (OGD) Platform India (2018) 'Community.data.gov', Retrieved from Month-wise Average International Crude Oil Prices (Indian Basket) from 2010-11 to 2016-17: https://community.data.gov.in/month-wise-average-international-crude-oil-prices-indian-basket-from-2010-11-to-2016-17/

Petroleum Planning & Analysis Cell (PPAC) (2016a), 'PPAC', Retrieved from http://www.ppac.org.in/content/150_1_Subsidy.aspx

Petroleum Planning & Analysis Cell (PPAC) (2016b), *Contribution of Petroleum Sector to Ex-Chequer,* 7 July, Retrieved from http://ppac.org.in/WriteReadData/userfiles/file/PP_4_ContributionToExchequer.pdf

Petroleum Planning & Analysis Cell (PPAC) (2016c), 'Gas Prices', Retrieved from https://www.ppac.gov.in/content/155_1_GasPrices.aspx

Petroleum Planning & Analysis Cell (PPAC) (2018), *Pricing of Petroleum Products.* http://ppac.org.in/content/149_1_PricesPetroleum.aspx (acessed 4 April 2018).

The Energy and Resources Institute (TERI) (2016), *TEDDY 2015/16.* New Delhi: TERI.

Annexes

Annex I. Summary of the Recommendations by Rangarajan and Kirit Parikh Committees and Status as of 2018

Recommendations	Decision
Rangarajan Committee	
Base the RGP for petrol and diesel on the TPP with weightage 80% of IPP and 20% of EPP.	Shifted the RGP of petrol and diesel to the TPP effective 16 June 2006.
Reduce the customs duty on petrol and diesel from 10% to 7.5%.	Customs duties reduced to 7.5% effective 15 June 2006. (Current duty is 2.5% effective 25 June 2011)
Restrict PDS SKO supplies to families	Not implemented
Adjust retail selling price of domestic LPG to the market level and eliminate subsidy altogether.	Not implemented
Increase OIDB cess from Rs1,800/MT to Rs4,500/MT to meet the OMCs' under-recovery	The government enhanced cess Rs2,500/MT effective 1 March 2006. Effective 14 March 2012, the government further increased it to Rs4,500/MT; by the end of financial year 2016, the government made it on ad valorem basis at 20%.
Kirit Parikh Committee	
Conduct better targeting of subsidy through implementing a transparent and effective distribution system for domestic LPG and PDS kerosene.	Government implemented the DBT for domestic LPG across the country on January 2015; and efforts were on for DBT to PDS kerosene in a phased manner.
Rationalise the allocation of PDS kerosene through rural electrification, LPG, and piped gas availability.	Government has accelerated universal electrification and incentivises states for their reduced up-take of kerosene.
Determine, through the market, the price of petrol and diesel, both at the refinery gate and at the retail levels.	Market-determined pricing for petrol and diesel was implemented.
Increase the price of PDS kerosene by Rs6/litre.	Increased the RSP of PDS kerosene by Rs3/litre
Increase the price of domestic LPG by at least Rs100/cylinder.	Increased the RSP of domestic LPG by Rs35/cylinder

DBT = direct benefit transfer, EPP =, IPP = import parity price, LPG = liquefied petroleum gas, OIDB = Oil Industry Development Board, PDS = public distribution system, RGP = refinery gate price, RSP = retail selling price, SKO = superior kerosene oil, TPP = trade parity price.
Source: Kirit Parikh Committee (2013).

Annex II. Notified Rates of Sales Tax/VAT for the Products (as of 31 March 2016)

States	Crude Oil (%)	Natural Gas (%)	Liquefied Petroleum Gas		Superior Kerosene Oil	
			Domestic LPG (%)	Non-domestic LPG (%)	PDS (%)	Non-PDS (%)
Andhra Pradesh	5	14.5	5	14.5	5	14.5
Arunachal	4	20	4	12.5	4	12.5
Assam	5	14.5	Nil	9	2	12.5
Bihar	5	20	1	14.5	5	5
Chandigarh	4	5	Nil	12.5	5	12.5
Chhattisgarh	5	25	Nil	5	4	14.5
Delhi	5	Nil	Nil	5	5	12.5
Goa	5	12.5	Nil	12.5	5	12.5
Gujarat	4, additional 1% TTO	12.5, additional tax 2.5% TTO	4, 1% on taxable turnover	Nil	Nil	25
Haryana	5	12.5, Additional tax on VAT 5%	Nil	12.5 (additional tax on VAT 5%)	Nil	12.5
Himachal Pradesh	4	4	4	13.75	Nil	
Jammu and Kashmir	5	5	Nil	13.5	5	13.5
Jharkhand	5	14	5	14	2	14
Karnataka	Nil	15	1	14.5	6	14.5
Kerala	5	Nil	5	14.5	5	14.5
Madhya Pradesh	5	14	5	14	5	14
Maharashtra	5	13	3	12.5	3	12.5
Manipur	5	14	5	13.5	Nil	5
Meghalaya	4	14.5	Nil	14.5	Nil	14.5
Mizoram	5	14	1.79	8	Nil	-
Nagaland	5, surcharge on tax 5%	5, surcharge on tax 5%	5, surcharge on tax 5%	12, surcharge on tax 5%	5, surcharge on tax 5%	15, surcharge on tax 5%
Orissa	5	15		14.5	Nil	14.5
Puducherry	5	5	1 for DBTL, 0.5 for non-DBTL	14.5	Nil	14.5
Punjab	4.5, surcharge on tax 10%	5.5, surcharge on tax 10%	4	13, surcharge on tax 10%	5.5, surcharge on tax 10%	13, surcharge on tax 10%

States	Crude Oil (%)	Natural Gas (%)	Liquefied Petroleum Gas		Superior Kerosene Oil	
			Domestic LPG (%)	Non-domestic LPG (%)	PDS (%)	Non-PDS (%)
Rajasthan	5	5	Nil	14.5	Nil	Nil
Sikkim	4.5	4.5	4.5	13.5	4.5	13.5
Silvassa	5	13	5	12.5	5	12.5
Tamil Nadu	5	5	Nil	14.5	5	25
Telangana	5	14.5	5	14.5	5	14.5
Tripura	5	14.5	1.5	14.5	Nil	14.5
Uttar Pradesh	4	21, additional tax on taxable turnover 5%	Nil	12.5, additional tax on taxable turnover 2%	4	12.5
Uttarakhand	5	20	5	13.5	Nil	Nil
West Bengal	5	5	Nil	5%, cess 1,000/MT	Nil	14.5

DBTL = direct benefit transfer for LPG, LPG = liquefied petroleum gas, MT = metric ton, PDS = public distribution system.
Source: MoPNG (2016a).

Annex III. Notified Coal Freight Rates by the Indian Railways for 2015/16

Distance (km)	Coal Railway Freight Rates (Rs/Ton)
0–125	205.6
126–150	250.7
151–175	281.0
176–200	314.2
201–225	345.0
226–250	378.0
251–275	411.1
276–300	443.7
301–325	474.6
326–350	506.6
351–375	538.7
376–400	571.3
401–425	614.2
426–450	636.8
451–475	668.9
476–500	702.4
501–550	768.6
551–600	834.3
601–650	899.4
651–700	964.3
701–750	1,029.6
751–800	1,093.7
801– 850	1,158.0
851–900	1,221.9
901–950	1,285.7
951–1,000	1,349.5
1,001–1,100	1,478.4
1,101–1,200	1,607.6
1,201–1,300	1,736.2
1,301–1,400	1,864.1
1,401–1,500	1,992.0
1,501–1,625	2,116.1
1,626–1,750	2,279.0
1,751–1,875	2,343.5
1,876–2,000	2,499.7
2,001–2,125	2,524.9
2,126–2,250	2,673.4
2,251–2,375	2,697.6
2,376–2,500	2,839.5
2,501–2,625	2,884.2
2,626–2,750	3,021.5
2,751–2,875	3,064.3

Distance (km)	Coal Railway Freight Rates (Rs/Ton)
2,876–3,000	3,197.5
3,001–3,125	3,238.7
3,126–3,250	3,368.4
3,251–3,375	3,408.7
3,376–3,500	3,534.8

Source: Indian Railways (2015).

Annex IV. Representative Price Build-up of Domestic LPG in Delhi (as of 15 August 2015)

Sl. No.	Elements	Unit	Effective 1 August 2015
1	FOB price at Arab Gulf of LPG[a]	$/MT	405.82
2	Add: ocean freight from AG to Jamnagar	$/MT	31.64
3	C&F (cost and freight) price[b]	$/MT	437.46
	OR	Rs/cylinder	395.20
4	Import charges (insurance/ocean loss/LC charge/port dues)	Rs/cylinder	4.28
5	Customs duty	Rs/cylinder	NIL
6	Import parity price [c] (sum of 3 to 5)	Rs/cylinder	399.49
7	Refinery transfer price for domestic LPG[d] (price paid by the oil marketing companies to refineries)	Rs/cylinder	399.49
8	Add: Storage/distribution cost and return on investment[e]	Rs/cylinder	9.96
9	Add: bottling charges	Rs/cylinder	20.58
10	Add: charges for cylinder cost[f]	Rs/cylinder	18.11
11	Add: inland freight	Rs/cylinder	30.68
12	Bottling plant cost before stock loss and working capital (sum of 7 to 11)	Rs/cylinder	478.81
13	Add: Cost of Working Capital[g]	Rs/cylinder	2.37
14	Cost Price at LPG Bottling Plant (sum of 12 to 13)	Rs/cylinder	481.18
15	Add: delivery charges	Rs/cylinder	10.00
16	Add: state-specific costs[h]	Rs/cylinder	Nil
17	Add: uncompensated costs (import costs, recovery for non-revision, rounding-off and delivery charges)[i]	Rs/cylinder	49.09
18	Market determined price (sum of 14 to 17)	Rs/cylinder	540.28
19	Add: VAT (including VAT on distributor commission) applicable for Delhi[j]	Rs/cylinder	0.00
20	Add: distributor commission	Rs/cylinder	44.88
21	Retail selling price (sum of 18 to 20)	Rs/cylinder	585.16
22	Retail selling price at Delhi (rounded)	Rs/cylinder	585.00
23	Less: cash compensation to consumer under DBTL (including impact of uncompensated cost to OMCs)[k]	Rs/cylinder	167.18
24	Effective cost to consumer after subsidy (22–23)	Rs/cylinder	417.82

[a] FOB (free on board) of LPG is weighted average of Saudi Aramco contract price for Butane (60%) and Propane (40%) for previous month and includes daily quotes of premium/discount (published by Platts 'Gaswire') averaged for the previous month.

[b] Import charges comprise insurance, ocean loss, LC charges, and port dues applicable on import of LPG.

[c] Import parity price (IPP) represents the price that importers would pay in case of actual import of product at the respective Indian ports.

[d] This is the price paid by the oil marketing companies (OMCs) to domestic refineries for purchase of finished petroleum products at the refinery gate.

[e] Storage/distribution cost and return on investment as fixed under notified 'PAHAL (DBTL) Scheme, 2014'.

[f] The cost incurred to fill LPG in 14.2 kg cylinders as per notified 'PAHAL (DBTL) Scheme, 2014'.

[g] Interest on working capital for 18 days stock holding at SBI prime lending rate as fixed under notified 'PAHAL
(DBTL) Scheme, 2014'.

[h] To neutralise the under-recoveries to the oil companies caused by various irrecoverable/non-recoverable taxes and levies of state/union territories/municipal corporations, a state-specific surcharge/cost is considered in the selling prices of petroleum products. In the case of Delhi, it is nil.

[i] In the price build-up, OMCs are charging consumers on account of import costs, recovery for non-revision in prices, rounding-off and differential delivery charges of Rs7.9/cylinder. All these costs are not compensated to OMCs as per the PAHAL (DBTL) scheme.

[j] Currently VAT at Delhi is nil and varies from state to state.

[k] Under the DBTL Scheme, the difference between the price of domestic. subsidised and non-subsidised LPG is being transferred to bank account of consumers by the OMCs. This also includes the uncompensated amount which is borne by the OMCs.

Source: IOCL (2015).

Annex V. Representative Price Build-up of PDS Kerosene in Mumbai (as of 15 August 2015)

Sr. No.	Elements	Unit	Effective 1 August 2015
1	FOB price at Arab Gulf of jet/kero (kerosene)[11]	$/bbl	64.72
2	Add: Ocean freight from AG to Indian ports	$/bbl	1.87
3	C&F (cost and freight) price[12]	$/bbl	**66.59**
	OR	Rs/litre	26.28
4	Import charges (insurance/ocean loss/LC charge/port dues)	Rs/litre	0.22
5	Customs duty[13]	Rs/litre	NIL
6	**Import parity price (at 29.5º C)** (Sum of 3 to 5)[14]	**Rs/litre**	**26.50**
7	**Refinery transfer price (RTP) for PDS kerosene** (Price paid by the oil marketing companies [OMCs] to refineries)	Rs/litre	**26.50**
8	Add: Inland freight and delivery charges	Rs/litre	0.68
9	Add: State-specific costs[15]	Rs/litre	0.73
10	Add: Marketing cost of OMCs	Rs/litre	0.36
11	Add: Marketing margin of OMCs	Rs/litre	0.23
12	**Total Cost Price** (sum of 7 to 11) -before excise duty, VAT, and wholesale and retailer commission	**Rs/litre**	**28.50**
13	Less: Under-recovery to OMCs[16]	Rs/litre	14.95
14	**Price charged to dealers (depot price)** - excluding excise duty and VAT (12-13)	**Rs/litre**	**13.55**
15	Add: Excise duty (including education cess)[17]	Rs/litre	0.00
16	Add: Wholesale and retailer commission and other charges fixed by state government	Rs/litre	1.24
17	Add: VAT (including VAT on wholesale and retailer commission) applicable for Mumbai	Rs/litre	0.44
18	**Retail selling price at Mumbai** (sum of 14 to 17)	**Rs./Litre**	**15.24**

Source: IOCL (2015).

[11] FOB (Free on Board) daily quotes of Jet/Kerosene at Arab Gulf including premium / discount published by Platts and Argus publications are averaged for previous month.

FOB (Free on Board) daily quotes of Jet/Kerosene at Arab Gulf including premium / discount published by Pla

tts and Argus publications are averaged

for previous month.

es & Port dues applicable on import of product.

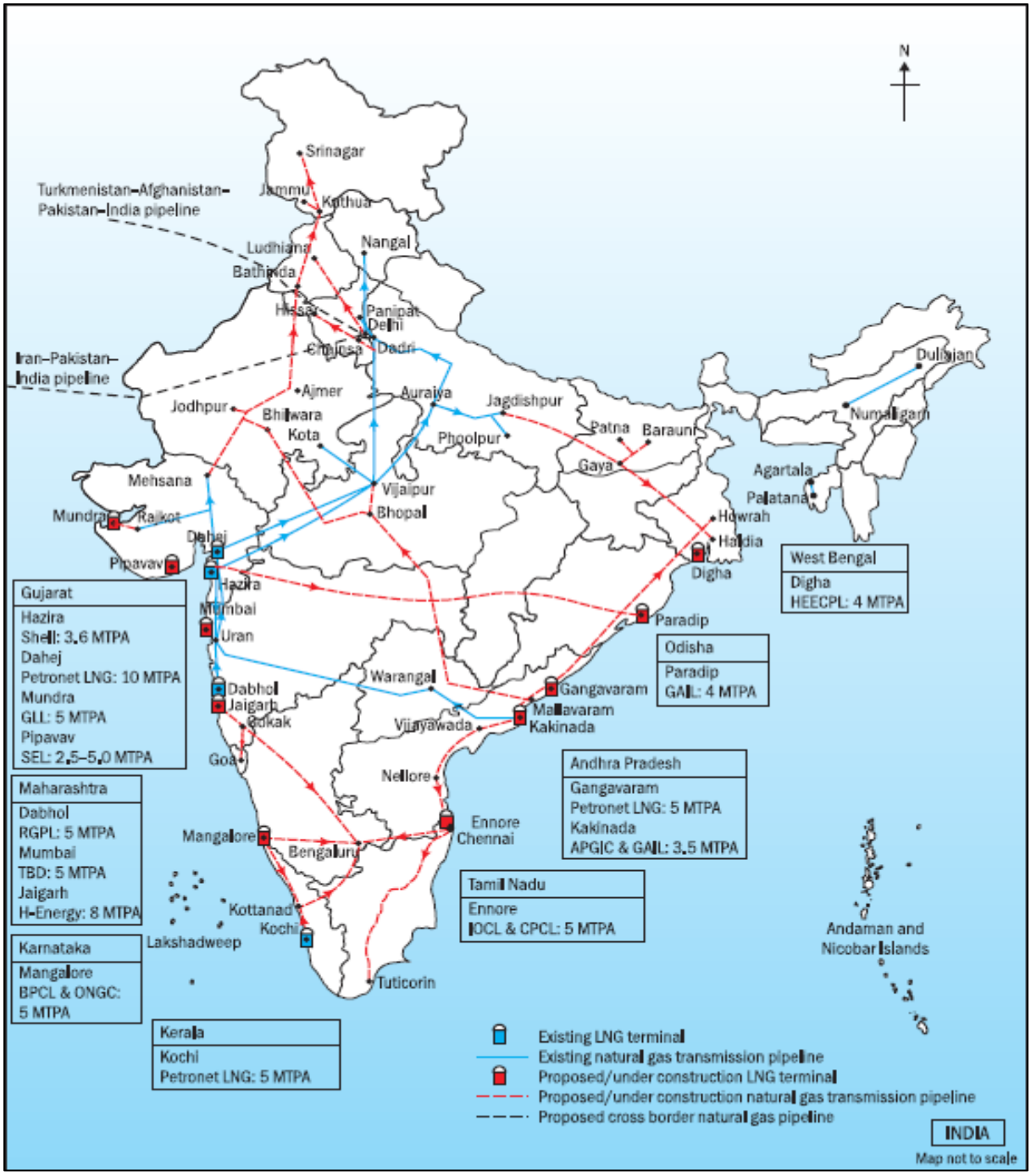
l import of kerosene at the respective Indian ports. Import Parity Principle is as per the 'PDS Kerosene and LPG (Domestic) Subsidy Scheme, 2002'.

IPP represents the price that importers would pay in case of actual import of kerosene at the respective Indian ports. Import Parity Principle is as per the 'PDS Kerosene and LPG (Domestic) Subsidy Scheme, 2002'.

is considered in the Selling Prices of petroleum products.

In order to neutralise the under-recoveries to the Oil Companies caused by various irrecoverable/non-recoverable Taxes and Levies of State/Union Territories/Municipal Corporations, a State Specific Surcharge/Cost is considered in the Selling Prices of petroleum products.

Annex VI. Natural Gas Infrastructure Map of India



Source: TERI (2016).

Annex VII. Representative Price Build-up of Domestic Coal for Gandhi Nagar Thermal Power Station, Gujarat in 2015/16 (Rs/MT)

Elements	Effective for 2015/16
Weighted average base price of domestic coal (to Gandhinagar thermal power plant, Gujarat)	1,429
Royalty	200
Excise duty	98
Total price after excise duty and tax	***1,728***
Sizing charge, surface transportation charge, etc.	60
Clean energy cess	200
Stowing excise duty	10
Other duties	233
Price before CST/VAT	2,231
CST	45
Total price on coal	***2,275***
Basic railway freight (RF)	1,510
Dynamic pricing charge (DPC) @ 15% of RF	227
Development surcharge (DS) (at 5% of basic RF and DPC)	87
Service tax (@3.708% of RF, DPC, and DS)	473
Total railway freight	2,297
Total delivered cost of coal	***4,572***

CST = central sales tax, VAT = value added tax.
Source: TERI analysis.

Annex VIII. Representative Price Build-up of Imported Coal for Gandhi Nagar Thermal Power Station, Gujarat in 2015/16 (Rs/MT)

Elements	Effective for 2015/16
CIF price of coal (to Gandhinagar thermal power plant, Gujarat)	5,664
Port handling charges	320
Customs duty	255
Price before central sales tax (CST)	6,239
CST (2%)	125
Total price (Rs/MT)	***6,364***
Basic railway freight (RF) (Rs/MT)	510
Dynamic pricing charge (DPC) at 15% of RF	77
Development surcharge (DS) (at 5% of basic RF and DPC) (Rs/MT)	29
Service tax (at 3.708% of RF, DPC, and DS) (Rs/MT)	23
Total railway freight (Rs/MT)	***638***
Total imported cost (Rs/MT)	***7,002***

Source: Authors' compilation.