Chapter 2

History of Pricing and Energy Reforms in India

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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

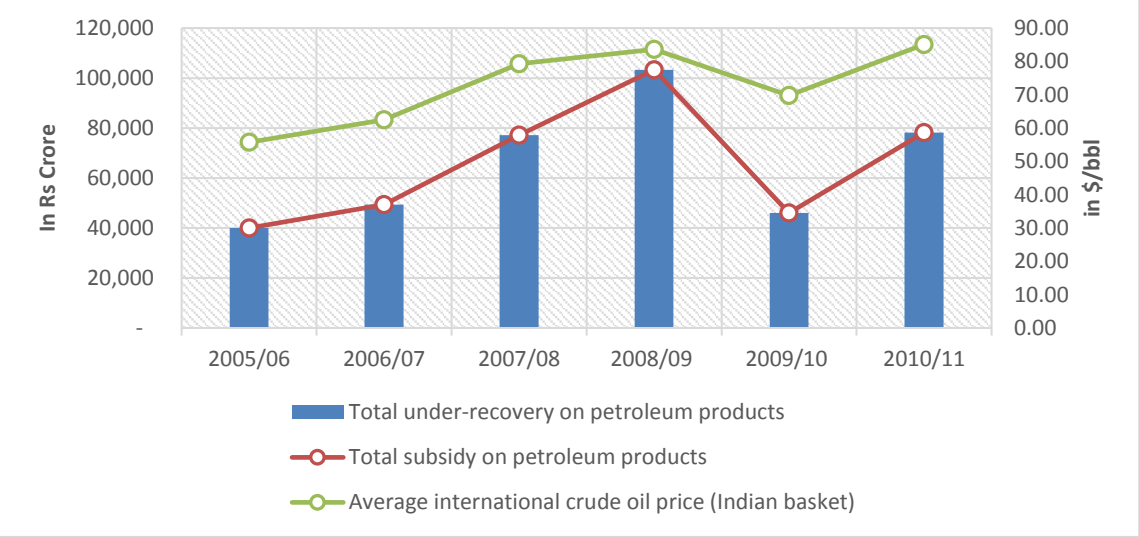
The post-APM pricing mechanism was expected to respond to the changes in the world market prices of crude oil and their impact on the prices of refined petroleum products and accordingly revise the retail selling prices in the country. Between 1 April 2002 and 1 January 2004, the prices of petrol and 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.

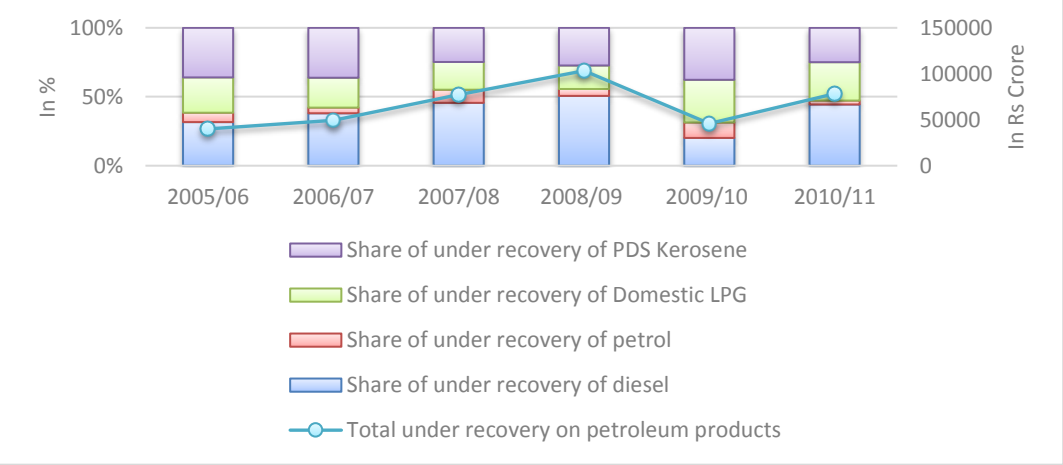
Historically, the government has been the major contributor in the under-recovery burden sharing. In tandem with the increase in under-recoveries over the year, the assistance provided by the government to the OMCs also increased, reaching the highest-ever level of Rs100,000 crore in 2012/13, apart from 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.