



**Report
of
The Expert Group
on
A Viable and Sustainable System of
Pricing of Petroleum Products**

Government of India

New Delhi

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CONTENTS

Preface

Abbreviations

CHAPTERS	PAGE
1 Background	1
2 Objectives of Policy and Issues	3
3 Need for Change in Policy	6
4 A Viable and Sustainable System of Pricing of Petroleum Products	9
Petrol	9
Diesel	11
PDS Kerosene	13
Domestic LPG	20
Taxation	25
Under-recoveries	25
Financing the Under-recoveries	27
Competition in the oil sector	30
Orders and Notifications	30
5 Summary of Recommendations	31

APPENDIX

Notes

1. Context and Terms of Reference
2. Overview of Government Policy on Pricing of Petroleum products
3. Oil Price Volatility in Recent Years and Government Interventions: International Experience
4. Analysis of Consumption Pattern of Kerosene and LPG

Table

- A1 State-wise reduction in the allocation of PDS Kerosene based on decline in percentage of households using kerosene, 1999-2000 to 2005-06.

Preface

India's growing dependence on imported oil products and the dramatic rise in the prices of crude oil to as high as \$148/bbl the international market in July 2008, followed by an equally dramatic fall, pose significant policy challenges. The Government's efforts to insulate domestic consumers, at least to some extent, resulted in huge fiscal burden for the Government and financial problems for the public sector oil marketing companies. But for the steep fall in crude price, it would have most likely disrupted the growth process of our economy. It is, therefore, important that we evolve a viable and sustainable pricing policy for the four major oil products, namely, petrol, diesel, kerosene and LPG, which constitute 63% of total consumption of petroleum products in 2008-09 and whose market prices are currently controlled by the Government.

In this context, the Expert Group was set up by the Ministry of Petroleum & Natural Gas on 31 August 2009. The group was to give its report within a period of three months. However, due to the complexity of issues, the need for some background studies and many other commitments of the members of the group, the group's term was extended till January 31, 2010. The group has made an attempt to outline a framework for pricing these four sensitive products which is expected to be feasible over a wide range of international prices and has to meet the various objectives of the Government.

It is my pleasure and also my privilege to thank all the Members of the Committee for their many important suggestions and for sparing their valuable time towards the finalization of this report.

The Committee records its special appreciation to the CEOs and Senior Officers of public and private oil companies, who made presentations on different aspects of the oil industry.

The Committee is also thankful to Dr. Himanshu of JNU who made special tabulations of the 2004-05 NSSO survey of household expenditure on petroleum products, to Dr. Shashank Bhide of NCAER for developing scenarios of NCAER model, to Dr. Shubhashis Gangopadhyay of India Development Foundation, New Delhi for carrying out a special study on crude price volatility in international market, and to Dr. Susan Thomas of Indira Gandhi Institute of Development Research (IGIDR) for preparing a special report on price tabulation through hedging – the experience with wheat.

We also thank the World Bank, Asian Development Bank, International Monetary Fund and Indian Embassies in China, Brazil and South Africa for providing useful information on policies of different countries for stabilizing domestic oil prices.

I am also thankful to the officers and staff of Petroleum Planning & Analysis Cell (PPAC) of the Ministry of Petroleum & Natural Gas for their contributions in the preparation of this report. I would particularly like to thank Dr. Basudev Mohanty, Director, PPAC, and Secretary to the Expert Group for his valuable contributions with many ideas and analysis of data, his untiring and enthusiastic help in drafting the report and in ensuring consistency and clarity. S/Shri Ram Singh, Director (Finance), Sanjay Malik, Additional Director (Finance), Vijay Sethi, Additional Director (Demand), Sachindra Singh, Joint Director (Planning), Humayun Akhter, Joint Director (Mktg.) and Anivesh Prasad, Assistant Director in PPAC provided excellent support.

Finally, I want to thank Shri P. Gopal and Shri P.R. Nair, Executive Secretaries in PPAC for diligently, carefully and cheerfully typing many drafts of the report and managing my office in PPAC.

Kirit S. Parikh
Chairman

February 02, 2010
New Delhi

Abbreviations

BPL	Below Poverty Line
CPCB	Central Pollution Control Board
EPP	Export Parity Price
GAIL	GAIL (India) Limited
GDP	Gross Domestic Product
IPP	Import Parity Price
LCVs	Light Commercial Vehicles
LED	Light Emitting Diodes
LPG	Liquefied Petroleum Gas
MOPNG	Ministry of Petroleum and Natural Gas
MSP	Minimum Support Price
NELP	New Exploration Licensing Policy
NSSO	National Sample Survey Organisation
OECD	Organization for Economic Co-operation and Development
OIL	Oil India Limited
OMCs	Public Sector Oil Marketing Companies
ONGC	Oil and Natural Gas Corporation Limited
PDS	Public Distribution System
PPAC	Petroleum Planning and Analysis Cell
RGVY	Rajiv Gandhi Grameen Vidyutikaran Yojana
TPP	Trade Parity Price
UID	Unique Identity

I BACKGROUND

1.1 India's imports of oil are increasing. Our import dependence has reached 80 per cent and is likely to keep growing. At the same time 2008 saw an unprecedented rise in oil price on the world market. Oil price volatility has also increased. Though future oil prices are difficult to predict, they are generally expected to rise. Given our increasing dependence on imports, domestic prices of petroleum products have to reflect the international prices.

1.2 When the average monthly price of Indian basket of crude oil on the world market increased from US\$ 36 / barrel in May 2004 to US\$132.5 / barrel in July 2008, the government did not permit Public Sector Oil Marketing Companies (OMCs) to pass the full cost of imports on to domestic consumers of major oil products, i.e., petrol, diesel, domestic LPG (i.e., LPG used by the households) and PDS kerosene (i.e., Kerosene sold through Public Distribution System of the Government). The consumers of these products thus received large subsidies. As a consequence, OMCs had large under-recoveries¹, which were financed partly by Government through issuing bonds, and partly by upstream public sector companies ONGC and OIL, and GAIL through price discounts. The OMCs also absorbed a part of the under-recoveries themselves. A detailed analysis on these issues is provided in Note 1, Appendix to the report.

1.3 These policies had a number of consequences. They put stress on government's finances. They reduced the cash surplus of upstream public sector oil companies restricting their ability for

¹ Under-recoveries and losses of oil companies are two distinct concepts. The difference between the two concepts has been explained in the report of the Rangarajan Committee (February 2006), which is reproduced below.

Refining of crude oil is a process industry where crude oil constitutes around 90% of the total cost. Since value added is relatively small, determination of individual product-wise prices becomes problematic. The oil marketing companies (OMCs) are currently sourcing their products from the refineries on import parity basis which then becomes their cost price. The difference between the cost price and the realized price represents the under-recoveries of the OMCs.

The under-recoveries as computed above are different from the actual profits and losses of the oil companies as per their published results. The latter take into account other income streams like dividend income, pipeline income, inventory changes, profits from freely priced products and refining margins in the case of integrated companies.

exploration of domestic fields and acquisitions overseas. As the oil bonds were not issued to OMCs on time, they created cash flow problems for OMCs who had to borrow from the market, which increased interest payments and reduced their surplus. Since only the OMCs were provided financial support, the private sector companies withdrew from oil marketing. This not only made infructuous the large investments they had made in setting up retail outlets, it also reduced competition in oil marketing. Subsidizing domestic consumers also did not incentivize them to economize on use of petroleum products. Rather, as prices remained low, and personal incomes rose, the demand for petroleum products such as petrol and diesel recorded double digit growth – higher than the GDP growth. Continuation of the present policies is not viable, particularly once oil prices rise again.

1.4 Over the years, Government has followed a variety of policies for pricing of petroleum products, all of which have been found to have some deficiency or the other. An overview of these policies is provided in Note 2, Appendix to the report.

1.5 Countries across the world have followed different strategies to deal with oil price volatility in the recent years. These are summarized in Note 3, Appendix to the Report.

1.6 A viable long-term strategy for pricing major petroleum products is required. A viable policy has to be workable over a wide range of international oil prices and has to meet the various objectives of the government. It should limit the fiscal burden on government and keep the domestic oil industry financially healthy and competitive.

II OBJECTIVES OF POLICY AND ISSUES

2.1 The very first question is: Should the government intervene at all in the market and set prices?

2.2 The first reason for intervention is to protect poor consumers so that they may afford kerosene for lighting, which is a necessity for those who do not have access to electricity.

2.3 Another objective may be to provide merit goods to consumers such as clean cooking fuels like natural gas, LPG and kerosene to replace use of biomass-based fuels such as firewood and dung. These biomass based fuels create indoor air pollution that causes respiratory diseases, eye infections and result in many premature deaths, particularly of women and children. Also, use of firewood encourages deforestation and dung is better used as a fertilizer. Moreover, the task of gathering these fuels keeps girls away from schools. Thus, use of clean cooking fuels has many social and environmental externalities, and as merit goods the government may promote them through subsidies.

2.4 Another frequently reported reason for Government's intervention is to insulate the domestic economy from the volatility of petroleum prices on the world market. It is feared that complete pass-through of increase in world oil prices may cause inflation which may persist even when oil price comes down. There is no clear evidence that in an increasingly open and competitive economy, price movements triggered by changes in the prices of oil products would persist over the medium-run. In addition, attempts to insulate the domestic economy against volatility requires discriminating between a secular price rise due to demand-supply forces and a price rise due to transient causes such as speculation in the world market. This is difficult to do.

2.5 To the extent the level of self-sufficiency in domestic oil production increases, the impact of international oil prices on domestic economy would be reduced. Thus, keeping domestic oil firms viable and in good financial health and providing an environment in which they can grow

are also important policy objectives. It is equally important to keep domestic private sector firms viable as it is to keep public sector firms viable. A level playing field between public and private sector firms as well as among public sector firms is desirable to promote competition.

2.6 A major objective of policy is to have an efficient and competitive oil economy that promotes efficient use by consumers, appropriate choice of fuels among substitutes and a proper choice of technique. This is best ensured by a competitive energy sector.

2.7 Intervention through price control necessitates that someone bears the financial costs. The issue therefore is to assess the costs and incidence of the burden of alternative mechanisms on different groups in the society. On whom the burden falls depends on the policy and the instruments used. If the costs are financed by a general increase in taxes, or by increasing fiscal deficit or by cutting other government expenditure, all these affect certain sections of the people adversely.

2.8 Price control means setting prices. If it is done on a cost-plus basis, it creates incentives for gold plating and creative accounting. Also, price calculations involve rigid specifications of items to be considered and their costs. This discourages innovation. For example, storage of LPG in large underground caverns facilitates imports by larger ships and reduces unloading time compared to storage in over-ground tanks. But, it may involve increase in operating costs. If the cost formula has set item-wise limits on operating costs, the project may be discouraged even if its total cost is much less.

2.9 If prices are to be fixed by the Government, that has to be based on some principle. Prices can be fixed based on pre-determined formula, which is derived from principles like import parity (IPP), trade parity (TPP), or export parity (EPP). This approach is also fraught with major deficiencies. The formula often involves elements of cost-plus. In an industry, which is continuously changing, a prescriptive and biased cost-plus pricing formula requires continuous monitoring and periodic adjustments in certain components of the formula. For instance, there is no single or unique formula for import parity which is applied globally (Note 3, Appendix). The Rangarajan Committee (February 2006) suggested a pragmatic approach of TPP for pricing of petrol and diesel which was accepted by the Government. It has, since then, been applied to

petrol and diesel. It was derived as a weighted average of IPP and EPP in the ratio of 80:20. The weight of 20 for EPP was based on the share of petroleum product exports in the total consumption in 2004-05. As suggested by the Committee, this ratio was required to be assessed periodically and adjustments made to align the formula to the current position. The trade parity pricing was also recommended by the Parikh Committee on Integrated Energy Policy (August 2006) as one which reflects the opportunity costs of a consumer or a producer. According to the Integrated Energy Policy, IPP is to be used for a product for which the country is a net importer and EPP for a product for which it is a net exporter. As long as the country exports a particular product, EPP equals TPP, as suggested by the Integrated Energy Policy. All these call for administrative and regulatory tasks to be performed by the Government or its agency on a permanent basis. Also, a prescriptive, formula-based approach involving direct government intervention does not result in a competitive price discovery process. Instead, it increases administrative burden. A competitive price discovery process empowers companies to follow their own judgments of market conditions and results in fair pricing of products. In the event of any company adopting unfair pricing methods, such activities can be curbed by the regulatory authorities set up by the Government.

2.10 Price control, subsidies and taxes can introduce distortions which may not be desirable. Apart from inefficient use, it also leads to erroneous choice of technique. For example, if diesel is cheap, it may encourage freight movement by trucks rather than by train. When the price difference between petrol and diesel is high, diesel driven vehicles may be preferred. If there is a large difference between the prices of diesel and kerosene, kerosene may be used to adulterate diesel. In 2008, we have even seen diesel being used in place of furnace oil. Intervention in pricing must be carefully thought out for its possible consequences.

III NEED FOR CHANGE IN POLICY

3.1 We have worked out domestic prices of the four products under alternative assumptions of crude price on the international market. Table C1 provides estimated retail selling prices of petrol, diesel, LPG and kerosene at Delhi corresponding to a range of prices of the Indian basket of crude oil from \$60/bbl to \$150/bbl. It reveals that when crude oil prices rise from US\$70/bbl to \$120/bbl, the price of petrol in Delhi is required to be increased by Rs.20/litre, the price of diesel by less than Rs. 20/litre and LPG by around Rs. 200 per cylinder.

Table C1: Domestic Prices of Petrol, Diesel, Kerosene and LPG derived from different levels of prices of the Indian Basket of Crude Oil.

International Prices					Indicative Retail Selling Price(at Delhi)			
Crude Oil (Indian Basket)	Petrol	Diesel	Kerosene	LPG	Petrol	Diesel	Kerosene	LPG
	(\$/bbl.)			(\$/MT)	(Rs./Litre)			(Rs. / Cyl.)
60	66	70	72	538	43.75	32.23	23.82	455.42
70	77	81	83	595	47.71	36.08	27.29	495.41
80	88	93	94	652	51.66	39.92	30.76	535.42
90	99	104	106	709	55.61	43.76	34.23	575.42
100	110	115	117	765	59.56	47.61	37.70	615.42
110	121	127	128	822	63.51	51.45	41.18	655.42
120	132	138	140	879	67.46	55.29	44.65	695.43
130	143	149	151	936	71.41	59.13	48.12	735.43
140	154	161	162	993	75.37	62.98	51.59	775.42
150	165	172	173	1,049	79.32	66.82	55.06	815.42
Current Retail Prices					44.72	32.92	9.23	281.20

The product prices of Petrol, Diesel, Kerosene, LPG have been derived through regression equations of crude and product prices in international market during January '07 to December '09.

The equation, $Y = a + bX$, in which Y is product price and X is crude oil price, gives the following estimates.

Coefficients	Petrol	Diesel	Kerosene	LPG
a	0.41	2.31	3.93	197.31
b	1.10	1.13	1.13	5.68

Exchange Rate considered at Rs. 47 per US Dollar. Indicative retail selling prices of PDS Kerosene and Domestic LPG are after netting off fiscal subsidy at current level of Rs.0.82/litre for PDS Kerosene and Rs.22.58 per cylinder for Domestic LPG.

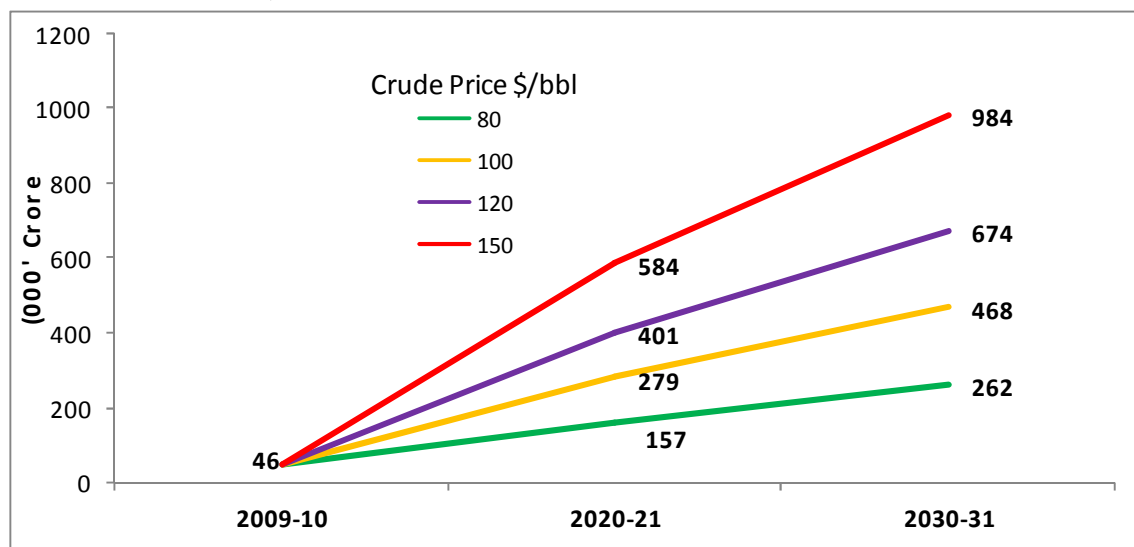
3.2 In order to assess the financial burden that may arise from rising under-recoveries of OMCs in the face of another price spiral in the international market, we have projected consumption based on two assumptions: (i) the annual average compound growth rates of petrol, diesel, kerosene and LPG during 2002-03 to 2008-09 apply to 2020-21 and 2030-31. (ii) The current level of prices set by the government will continue. The projected consumption of petroleum products by 2020-21 and 2030-31 is given in Table C2.

Table C2: Consumption of Petroleum Products, 2001-02 to 2030-31

Product	Actual Consumption				Projections	
	2001-02	2004-05	2008-09	CAGR 2002-09	2020-21	2030-31
MS	7.0	8.3	11.3	7.0	25.4	49.9
HSD	36.5	39.7	51.7	5.1	93.5	153.4
SKO	10.4	9.4	9.3	-1.6	7.6	6.5
LPG	7.7	10.2	12.2	6.7	26.6	51.1
Sensitive Products	61.7	67.5	84.4	4.6	144.4	226.0
Free Industrial Products	38.7	44.1	49.0	3.4	73.3	102.6
TOTAL	100.4	111.6	133.4	4.1	217.0	325.6

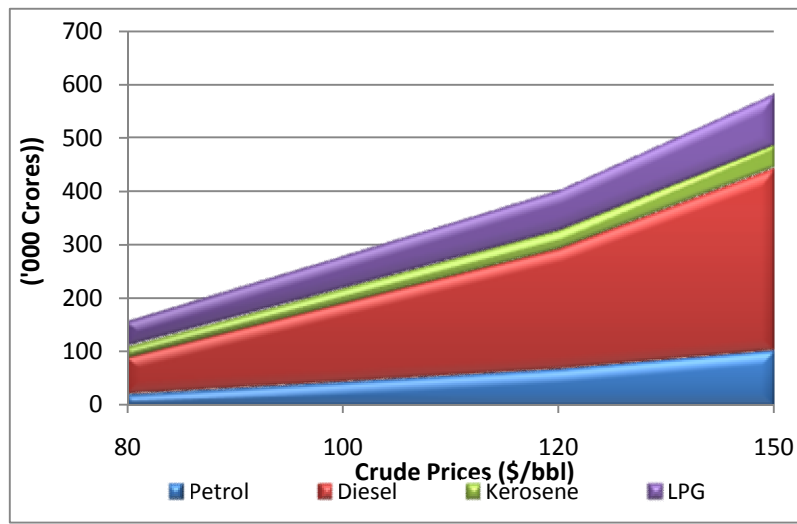
Source: PPAC

Figure C1: Total under recoveries of oil marketing companies at different levels of Crude Prices, 2009-10 to 2030-31



Source: PPAC

Figure C2: Product-wise under-recoveries in 2020-21



Source: PPAC

3.3 Based on these projected demand, the under-recoveries of oil marketing companies on these four products have been worked out (Figure C1) At crude oil price of \$80/bbl, the total under-recoveries of OMCs on sale of petrol, diesel, LPG and PDS kerosene work out to Rs.1,57,000 crore by 2020-21. If oil prices rise by 25% to \$100/bbl, the under-recoveries will rise higher by 77%. Likewise if oil prices rise to \$120/bbl (50% increase) the under-recoveries will rise by 155%. Higher the growth rate of GDP and longer the period beyond 2020-21, the much higher will be the under-recoveries.

3.4 At different levels of crude oil prices, product-wise under-recoveries of OMCs on sale of petrol, diesel, LPG and PDS Kerosene is presented in the Figure C2. These estimates reveal the dominant share of diesel in OMC's under-recoveries. It will rise from 45% at crude oil price of \$80/bbl to 58% at \$150/bbl by 2020-21.

3.5 Such a trend needs to be stemmed early. It suggests that at current levels of prices of petrol, diesel, PDS kerosene and domestic LPG, the financial burdens on the companies as well as on the government will be unsustainable. Therefore, there is a need to change the existing policy which can strike a balance between the capacity of the consumer to bear higher prices and fiscal stability of the government.

IV A VIABLE AND SUSTAINABLE SYSTEM OF PRICING OF PETROLEUM PRODUCTS

4.1 In Chapter II, we have discussed in detail the inadequacies associated with a formula-based prescriptive pricing framework. Such a framework does not result in a competitive price discovery process and often calls for administrative interventions by the government. Keeping in view the policy objectives and issues outlined in Chapter II, we examine the specific cases of petrol, diesel, PDS kerosene and domestic LPG in the following sections.

A PETROL

4.2 Petrol is largely an item of final consumption. Its price, therefore, has a very small impact on inflation due to forward linkages. The average annual use of petrol per vehicle is given in Table P1.

Table P1: Average Annual Consumption of Fuel by Class of Vehicles

Type of Vehicle	Average Distance Covered annually (KM)	Fuel Efficiency (KM/Litre)	Litres/ Vehicle/ Year	Monthly Fuel Cost at price on 1.1.10 in Delhi (Rs)
Two Wheelers (Petrol)	6300 (10000)	73.0	86	320
Three Wheelers (Petrol)	35000 (40000)	34.0	1,029	3835
Cars (Petrol)	8000 (15000)	13.5	593	2210
Cars (Diesel)	8000 (15000)	14.0	571	1566
MPV (Diesel)	7800 (37000)	8.7	897	2461
Bus (Diesel)	55000 (60000)	4.1	13,415	36,802
Heavy Trucks (Diesel)	55000 (35000)	3.6	15,278	41,913
Light Trucks (Diesel)	20000 (40000)	4.5	4,415	12,112

Source: 'Residential and Transport Energy use in India: Past Trend and Future Outlook' by Ernest Orlando Lawrence Berkeley National Laboratory, USA, January 2009

Figures in parentheses are estimates for Delhi, taken from the report of CPCB (2000)

4.3 A two-wheeler consumes, on an average, 86 litres of petrol per year, for which the owner spends Rs. 320 per month (Rs. 510 in Delhi). The fuel expenditure of car owners is much larger at Rs. 2210 per month (Rs. 4140 in Delhi). Motorized vehicle owners are largely well-off persons belonging to the upper two/three deciles of the population. There is no reason to subsidize this class of consumers.

4.4 Full price pass-through at US \$ 80/bbl will increase the retail price of petrol by around Rs.7/litre. The additional expenditure of a two-wheeler owner would be only Rs. 50 per month (all-India average). Even for two-wheeler owners in Metro Cities who drive more (around 10000 KM per year), the increase on fuel expenditure will be around Rs. 80 per month. Even if the crude price increases to \$120 compared to the present price of around \$70/barrel, the retail outlet price of petrol, assuming the current tax regime, will increase by Rs. 23/litre (i.e., Rs.20/litre on the basis of rise in indicative selling price of petrol from \$70/bbl to \$120/bbl of crude price + Rs.3/litre on account of the current price being below the estimated indicative selling price) and the additional expenditure, assuming no reduction in use, will be around Rs. 160/month on a two-wheeler user and less than Rs. 1000/month on a private automobile user (at all-India level).

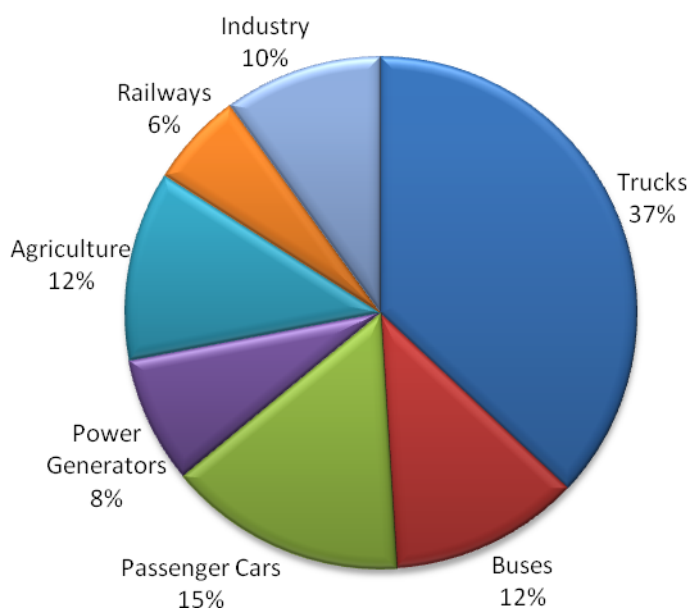
4.5 If higher petrol prices lead to less driving, more fuel efficient vehicles and an efficiency increase by 20%, the additional cost would be that much less.

4.6 The Group believes that the cost increases can be borne by motorized vehicle owners and recommends that petrol prices should be market-determined both at the refinery gate and retail levels.

B DIESEL

4.7 The consumption of diesel by different users in 2008-09 has been shown in Figure D1. Trucks accounted for 37% and buses 12% of total diesel consumption in 2008-09. Agriculture's share was 12%.

Figure D1: User-wise percentage share in total diesel consumption, 2008-09



Source: PPAC

4.8 The burden of diesel price increase on agriculture depends on where it is used. In 2008-09, 12 % of total diesel went to agriculture (i.e., to tractors, thrashers, tillers, harvesters, pump sets etc.). The cost of diesel in agriculture would be accounted for by the Government while fixing the Minimum Support Price (MSP) for major crops. Therefore, any increase in the cost of diesel will be reflected in the price and will not adversely affect farmers. However, those who use diesel relatively more may not get fully compensated by MSP. Higher diesel price will induce them to use less diesel which may reduce over-use of ground water prevalent in many parts of the country. Of course, higher diesel price resulting in higher MSP will increase subsidy for PDS, but it would be much less than the reduction in under-recovery on diesel.

4.9 Trucks and LCVs consume around 40% of diesel. It is reported that with industrial revival and higher economic growth, the truck owners generally raise their rentals in consonance with growth. Therefore, long distance charge for a round trip between Delhi and Mumbai for a 9-tonne truck is more than Rs. 40000 today whereas its diesel consumption works out to around Rs. 22000. Higher diesel price would encourage fuel use efficiency as well as greater use of railways for freight movement. Railways consume around 1/4th as much diesel per net tonne kilometer as trucks.

4.10 Even assuming that the truckers, power generators, industrial users etc.(other than the passenger car owners) are able to pass on fully the additional cost of diesel, an increase of Rs. 4 per litre would mean an increase of around Rs. 20,000 crore in their cost of diesel which would be around 0.4 % of GDP in 2008-09. This should be compared with the inflationary impact of subsidies, which would be similar.

4.11 Car owners who drive diesel vehicles, including Sports Utility Vehicles (SUVs), should be able to bear the additional cost. There is no economic or social reason to subsidize them.

4.12 Thus the Group recommends that the price of diesel should also be market determined both at the refinery gate and retail levels.

4.13 With deregulated oil prices, once households and firms clearly see that international factors drive domestic petroleum product prices, and when monetary policy is seen to emphasize price stability, households and firms would be relatively relaxed. When there is a temporary shock to oil prices, they would be much less likely to react to short-term fluctuations in prices through wage hikes or increases in product prices. Thus, in OECD countries, from 1979 onwards, where central banks have shifted into de facto or de jure 'inflation targeting', the great commodity inflation from 2002 onwards did not pass through into broad-based inflation in the 2002-2008 period.

4.14 Petrol and diesel used in cars, including SUVs, are for final consumption. The higher excise duty on petrol compared to diesel encourages use of diesel cars. While greater fuel efficiency of a diesel vehicle should not be penalized, a way needs to be found to collect the same level of tax that petrol car users pay from those who use a diesel vehicle for passenger transport. An additional excise duty on a diesel vehicle corresponding to the differential tax on the petrol should be levied. At the present excise rates, the additional excise duty paid by a petrol vehicle owner who on an average drives 8000KM/year and gets an average mileage of 13.5 KM/litre is around Rs.10000 per year. The present discounted value at 10% discount rate over the 10-year life of a vehicle would be around Rs. 67,500, and at 5% discount rate it would be Rs. 81,000. An appropriate discount rate would be the rate on Government bonds. An additional excise duty calculation based on the following model, adjusted for the existing differential, if any, in excise duty between petrol-driven cars, and diesel-driven cars, should be levied on diesel car owners.

$$\text{Additional Excise} = (\text{Rate of Excise on petrol} - \text{Rate of Excise on Diesel}) \times (\text{Petrol consumption per year by an average petrol car user}) \times \left[\frac{1}{1+r} \right] \times \left[1 - \frac{1}{(1+r)^{10}} \right]$$

where 'r' is discount rate and 10 years is assumed lifetime.

At the present rates and a discount rate of 5 per cent, an additional excise duty of Rs. 80,000 should be levied on diesel driven vehicles. Some persons may still opt for a diesel vehicle if they expect to drive much more than an average petrol vehicle owner does. That should not be discouraged.

C KEROSENE

4.15 PDS Kerosene price has remained at around Rs.9 per litre at Delhi since 2002. The under-recovery on kerosene has grown from Rs. 3,751 crore in 2003-04 to Rs.28,225 crore in 2008-09.

Table K1: **Expenses on PDS Kerosene consumption, Discretionary items and Total household consumption (Mean Values)**

Decile	Quantity of Kerosene Consumed @ (Litre)			Expenses (Rs.)		
	Only from PDS	Only from Other Sources	From both Sources *	On consumption PDS Kerosene	On consumption of discretionary items#	Total household consumption
RURAL						
1	2.7	2.2	4.8	28.4	211.1	1,386.6
5	3.3	2.7	5.6	33.4	343.9	2,222.5
10	3.4	3.6	6.8	34.9	991.8	5,872.1
<i>Total</i>	3.3	2.8	5.7			
URBAN						
1	4.0	3.4	7.4	41.0	335.7	2,016.0
5	4.5	5.2	10.1	49.1	642.1	3,444.5
10	3.9	4.6	9.2	42.2	2524.4	10,014.6
Total	4.2	4.6	9.5			

@ *The figures relate to different categories of households.*

Discretionary items include entertainment, personal effects, toilet articles, sundry articles, consumer services and conveyance.

Source: NSSO Survey (Note 4, Appendix)

4.16 The NSSO Survey of 2004-05 shows who uses how much kerosene and for what purpose. The Table K1 summarises the detailed tables given in Note 4, Appendix to the Report. Certain important findings are given below:

- (a) In 2004-05, 62% of the rural households got kerosene only from PDS and consumed less than 3.5 litres per month, 10.8% from both PDS and other sources and consumed around 5 litres per month. 16.6% got only from other sources consuming less than 3.0 litres per month and 10.5% did not use kerosene at all.

- (b) Only 1.3% of rural households use kerosene for cooking. Among the poorest four deciles, less than 1% used it for cooking but 60% used it for lighting. As BPL households meanwhile are connected to electricity grid under Rajiv Gandhi Gramin Vidyutikaran Yojna (RGGVY), the percentage of BPL households using kerosene for lighting would have been reduced substantially by now.

4.17 The primary objective of subsidizing kerosene is for lighting purpose. In the absence of electricity, kerosene has, for long, been the only source of lighting (apart from more expensive vegetable oil-based lamps). However, with the development of LED lights, LED lanterns using ordinary dry cells provide an alternative which, at comparable cost to what household spend on subsidized kerosene, provides better light and involves no subsidy. As manufacturers make these lanterns available across the country, the need for kerosene for lighting will reduce. Solar lighting systems can also provide an alternative albeit at a much higher initial cost. These alternatives pose the problem of safe disposal of used-up cells.

4.18 Since kerosene subsidy is going largely for lighting, the allocations should be reduced as more and more BPL households are connected to the electricity grid. Such connections under the RGGVY are subsidized and continuing kerosene supply to such households amounts to double subsidy.

4.19 The distribution of PDS kerosene across States is uneven. There is a continuous decline in the percentage of households using kerosene. This trend has also been highlighted in the report of the Chaturvedi Committee (2008).

4.20 The analysis made by Petroleum Planning & Analysis Cell (PPAC) has been given in Table 1, Appendix. The important finds are summarized in Table K2.

Table K2: Reduction in State-wise allocation of PDS Kerosene

State	Per Capita Net State Domestic Product, 2005-06 ('000 Rs)	Per Capita Kerosene allocation 2007-08 (Litre)	Percentage Decline in households using PDS Kerosene during 1999-2000 to 2005-06	Percentage reduction in Kerosene allocation by the Ministry 1999-2000 to 2005-06	Scope for further reduction up to 2005-06 (%)
1	2	3	4	5	6
High Income	48.06	14.1	53.2%	19.1%	33%
Middle Income	28.53	9.4	49.0%	22.0%	26.8%
Low Income	19.92	10.0	23.9%	6.6%	17.3%
Total	25.72	10.3	32.6%	12.8%	19.8%

Source: Col.2: Economic Survey, Govt. of India
 Col.3: Petroleum Planning & Analysis Cell, MOPNG
 Col.4: NSSO Surveys of Household Expenditure
 Col.5: Petroleum Planning & Analysis Cell, MOPNG
 Col.6: Derived by subtracting Col.5 from Co.4 (figures may not exactly match due to aggregation and rounding off data)

States included in:

- (i) **High Income:** Chandigarh, Goa, Delhi, Pudicherry, Haryana, Maharashtra, Punjab, Andaman & Nicobar Islands, Gujarat, Himachal Pradesh
- (ii) **Middle Income:** Kerala, Tamil Nadu, Karnataka, Andhra Pradesh
- (iii) **Low Income:** West Bengal, Mizoram, Tripura, Uttarakhand, Arunachal Pradesh, Meghalaya, Manipur, Jharkhand, Assam, Orissa, Madhya Pradesh, Uttar Pradesh, Bihar.

4.21 Table K2 reveals the following trend.

- (a) Over the years, distribution of PDS kerosene has developed an inverse relationship with the income levels of states, which needs to be rationalized. For instance, the average per capita kerosene allocation in high income States in 2007-08 was 14.1 litre which was 41% higher than that of the low income States.

- (b) Besides, with economic development and improvement in power supply, the percentage of households using kerosene in different States has declined. The NSSO surveys of household expenditure during 1999-2000 to 2005-06 revealed that around 53% of households in high income States have exited PDS kerosene since 1999-2000, as compared to 24% in low income States.
- (c) Against the above decline in households using kerosene, the actual reduction in kerosene allocation has been much less – 12.8% against the estimated decline of 32.6%. Thus, there was a potential for further reduction by around 20% by 2005-06.

4.22 There is, therefore, significant scope to rationalize allocation of PDS kerosene across States. NSSO data suggests that the norm of 5 litres per household per month should be more than adequate for lighting. Most of the households use only 3.5 litres per month. State-wise allocation should be based on the number of BPL households without electricity in rural areas and urban households using kerosene for cooking. Since electricity supply may be erratic, a smaller allocation say 2 litres per month may be made for electrified BPL households. As shown by PPAC, the allocations can be based on NSSO Survey data and revised when new data becomes available. Even if we use the 2005-06 data, this should reduce the PDS kerosene by 20 %, on all-India basis (Table K2). Subsequent progress of rural electrification, LPG and piped gas availabilities is expected to reflect much larger reductions in next NSSO surveys.

4.23 There is also scope to revise the price of kerosene. The rural households in the poorest decile spends around 2 per cent of its monthly expenditure on kerosene. This is also around 13 per cent of , what one might call, its discretionary expenditure on entertainment, personal effects, toilet articles, sundry articles, consumer services and conveyance. There is therefore, some scope for increasing price for PDS kerosene.

4.24 Even the poorest decile of rural households can afford to spend a bit more on kerosene. Per capita growth of national income, when taken at constant prices, broadly reflects the changes in purchasing power of consumers and therefore could be a reasonable mechanism to derive the

current fair price. However, since the payment is to be made in current rupees, there is some logic in using per capita income in current prices. There is an implicit assumption that wages etc would have been adjusted to reflect inflation. This metric, in a sense, approximates the capacity of the individual to absorb price increases. We can refine it and use an appropriate measure of income growth for rural and urban populations. Thus, if we take the growth rate of per capita GDP in agriculture, that should give a good measure of the ability of the rural poor to pay. In fact this will be a lower bound as the per capita rural incomes are likely to have grown at a higher rate than the growth of agricultural GDP as a substantial part of rural income comes from activities which are non-agricultural. A similar argument can be made for using aggregate GDP growth as a measure for the urban poor as a lower bound as urban incomes dependant largely on non-agricultural GDP, would have grown at a higher rate than the total GDP. Since Kerosene is used largely in rural areas, we can revise its price on the basis of growth of per capita agricultural GDP and since LPG is used largely in urban areas, its price should be determined on the basis of growth of total GDP. This will keep the share of expenditures on Kerosene and LPG in the total consumption expenditure of rural and urban households at the same levels as in 2002 and 2004.

4.25 To check that the increase in average income also reflects increase in income of the poor we looked at the Gini Coefficients of rural and urban populations. Comparable estimates for 2004-05 and 2006-07 show that the Gini Coefficient for rural population has remained unchanged at 0.281. The various projects of Bharat Nirman and the National Rural Employment Guarantee Programme should, if anything, have lowered the coefficient of rural population. For urban population, the Gini coefficient was 0.364 in 2004-05 and lower at 0.354 in 2006-07. We therefore used percentage changes in average incomes to reflect changes in the incomes of the poor.

4.26 Table K3 provides the trend of growth in per capita GDP of agriculture sector (including forestry and fishery). PDS Kerosene prices have not been raised from around Rs.9 per litre since March 2002. During 2002-03 to 2008-09, the per capita agriculture GDP at current prices has increased by around 60% (at an annual compound growth rate of 6%). By 2009-10, the increase is likely to be 66%. A 66% increase in kerosene price would keep the share of expenditure on

kerosene at the same level as in 2002-03. Thus, the price of PDS kerosene could be raised by 66% to reach a level of around Rs. 15/litre without putting undue burden on the poor.

Table K3: Growth in per capita agriculture GDP at current prices, 1999-2000 to 2008-09

Year	Per capita Agriculture GDP at current prices (Rs)	Growth (in per cent)
1999-00	4461	4.3
2000-01	4412	-1.1
2001-02	4679	6.1
2002-03	4470	-4.5
2003-04	4966	11.1
2004-05	5073	2.2
2005-06	5657	11.5
2006-07	6115	8.1
2007-08	6877	12.5
2008-09	7468	8.6
2009-10 (Est.)	7916	6.0

Source: Central Statistical Organisation

4.27 The Group recommends that issue price of PDS kerosene be raised by Rs.6/litre and should be revised every year in step with per capita agricultural GDP at nominal prices.

4.28 Large price difference between PDS kerosene and diesel is an incentive to divert kerosene to adulterate diesel. Estimates suggest 35% or more of PDS kerosene is diverted for unauthorized purposes including adulteration. A consequence of this diversion is that the more than Rs.20000 crore of investment in producing Euro III and Euro IV diesel would be negated to large extent if diesel continues to get adulterated by kerosene.

4.29 The price of PDS kerosene in India is very low in comparison with that in the neighbouring countries namely, Bangladesh and Nepal. This encourages cross-border smuggling and adulteration. The price of kerosene in Bangladesh and Nepal is Rs. 29.28/litre and Rs. 36.29/litre respectively as in January 2010, more than 3 to 4 times the price in India.

4.30 The first important step in kerosene pricing should be to have one price in the market and it should be close to the price of diesel so as to eliminate any incentive to mix it with diesel. This can be achieved if PDS kerosene is provided to BPL households through a system of smart cards with biometric identification. The cards would indicate the household's entitlement of subsidized kerosene. This will reduce PDS kerosene need by one third, as diversion would cease.

4.31 Since the use of Smart Cards for targeting the subsidy on kerosene may take two years or more until the UID project becomes fully operational, it is recommended that allocation across states should be rationalized to bring down all-India allocation by at least 20% and the price of PDS kerosene be increased to at least Rs.15/litre so as to keep subsidies under reasonable level and to keep diversion and adulteration under check. Thereafter, price of PDS kerosene be raised every year in step with the growth in per capital agricultural GDP at nominal price.

4.32 For calculation of the under-recoveries incurred by the OMCs, the extant methodology based on import parity pricing may be continued so long as the country is net importer of kerosene. The OMCs marketing PDS kerosene will be compensated fully for the under-recoveries incurred on sale of PDS kerosene as per the mechanism discussed in paragraph 4.49.

D LPG

4.33 Domestic consumption of LPG has increased from 9.3 MMT in 2003-04 to 12.3 MMT in 2008-09. Sale of subsidized domestic LPG cylinders constituted 86.5% (749 million cylinders of 14.2 KG) of total LPG sale in 2008-09. The consumer subsidy on domestic LPG has grown from Rs 5,523 crore in 2003-04 to 17,600 crore in 2008-09 and is estimated to be around Rs 14,152 crore in 2009-10. Since LPG consumption is growing and global price is also expected to increase, the subsidy burden will keep growing. This is not a sustainable situation.

4.34 Normally, a subsidized product ought to be given in limited amounts. However, domestic LPG is both heavily subsidized and available in unlimited quantity. The burden of subsidy can be reduced by either raising the price or reducing the quantity or both.

4.35 Table L1 also gives data in terms of cylinders used by households. It is seen that rural households use from 5.17 to 7.91 cylinders per year. The LPG-using rural households belonging to the four poorest deciles use less than 6 cylinders per year and the richer households use more. Rural households use less cylinders than urban households as the former have access to alternate fuels such as fuel wood. The households belonging to the poorest decile of urban consumers use 8 cylinders whereas the top 5 deciles use 10 cylinders.

Table L1: Mean Monthly Expenditure on LPG by LPG using households over 30 days (Rs.) and implied quantity (cylinders)

Decile	Mean Monthly Expenditure on LPG (Rs.)		Mean Total Household consumption expenditure		No. of 14.2 KG cylinders / year	
	Rural	Urban	Rural	Urban	Rural	Urban
Poorest 1 st	125.2	205.9	1501.8	2378.0	5.17	8.17
2	163.7	222.1	2928.6	2816.8	6.62	9.10
3	153.1	234.9	2367.7	3132.3	6.18	9.35
4	145.9	239.1	2369.5	3542.6	5.98	9.60
5	176.6	245.0	2793.3	3853.1	7.09	9.79
6	189.1	255.3	2952.0	4390.9	7.53	10.29
7	179.9	248.7	3111.7	4677.8	7.27	10.19
8	185.0	255.2	3493.5	5270.0	7.41	10.17
9	189.0	256.9	3971.5	6304.2	7.56	10.37
Richest 10	196.1	250.0	6597.5	10818.8	7.91	10.17

Source: NSSO Survey (Note 4, Appendix)

4.36 The LPG-consuming households in the top 3 decile in urban areas, comprising some 22 million households, use nearly 40 per cent of LPG and spend less than 5 per cent of their total expenditure. These households get a large part of the subsidy even when they have the capacity to pay the market price for LPG and will use LPG even when the price is raised. Since providing universal subsidy through price below the cost misdirects the subsidy to the relatively affluent, a strong case can be made for subsidizing LPG as a clean cooking fuel for the poor.

4.37 In 2004-05, 57% of urban households but only 8.6% of rural households used LPG. The access to LPG has substantially increased and has grown from estimated 84.5 million households in 2004-05 to 111.3 million by September 2009. The Rajiv Gandhi Gramin LPG Vitruk Yojana launched in 2009 aims to cover 75% of the population by 2015 which will substantially increase access of rural households to subsidized LPG.

4.38 If the poor are to be subsidized, we need an effective mechanism to provide the subsidy. A smart card system or transfer on entitlement based on the UID platform can be used which entitles a household a fixed quantity of LPG at subsidized price beyond which the market price would be charged.

4.39 Alternatively, direct cash transfer may be provided and everyone is charged the market price. The argument for providing subsidy in kind rather than in cash rests on the problem of intra-household distribution of expenditure where a woman's needs may get a lower priority, and on the merit good nature of LPG use. The intra-household distribution problem can be addressed to some extent by transferring cash to the account of woman of the household.

4.40 The eventual goal of policy should be to provide subsidized clean cooking fuel like LPG to the BPL families. There should be one price in the market and subsidy would be transferred to the entitled consumer either through entitlement or through cash transfers to the woman of the household. The UID system, which is currently under progress, or the Smart Card system piloted by MOPNG with biometric identification could provide a transparent, targeted subsidy delivery mechanism which can eliminate diversion of LPG cylinders for unintended uses. However, since rolling out of the Smart Card mechanism on the UID platform may take at least

two years, an interim arrangement has to be devised to contain the ballooning LPG subsidy. In this regard, we have only two options: either ration the quantity or raise the price.

- a) Any scheme of rationing or limiting the number of cylinders at subsidized price without Smart Cards will involve a complex monitoring and inspection system more likely to promote Inspector Raj rather than effectively reduce subsidy.
- b) In the interim, therefore, there is no choice, but to raise the price of domestic LPG if the subsidy burden is to be reduced. As the NSSO survey data have shown, households have flexibility in absorbing certain additional costs on LPG by adjusting expenditure on discretionary items. Accordingly, LPG price can be increased at least to the extent their income has increased so that the proportion of income that they spend on LPG remains the same.
- c) The logic of adopting changes in GDP as a yardstick for increasing prices of PDS kerosene has already been explained in para 4. A similar dispensation can be devised for domestic LPG also. Since LPG is used largely in urban areas its price should be determined on the basis of growth of total GDP (in contrast to agricultural GDP considered for kerosene). The Table L-2 provides the relevant information.

Table L2: Per capita growth in GDP, 1999-2000 to 2009-10

Year	Per capita GDP at current prices for urban population (Rs)	Growth (per cent)
1999-00	64379	7.2
2000-01	67285	4.5
2001-02	71109	5.7
2002-03	74364	4.6
2003-04	80937	8.8
2004-05	89010	10.0
2005-06	98481	10.6
2006-07	109994	11.7
2007-08	121956	10.9
2008-09	135045	10.7
2009-10 (Est.)	148550	10.0

Source: PPAC based on the data given in Economic Survey 2008-09.

4.41 The per capita urban GDP during 2004-05 to 2009-10 has increased by 84% (say 85%). Accordingly, the fair price of domestic LPG cylinder from the base price of Rs. 262/cylinder in 2003-04 is estimated to be Rs. 485/cylinder in 2009-10. Another way of assessing the level of price of LPG cylinder in 2009-10 is to maintain the percentage of LPG subsidy in the price of 2003-04.

4.42 The Group, therefore, recommends as follows:

- (a) As a clean cooking fuel, LPG is a merit good and subsidy to poor households may be needed and justified. The level of subsidy should be fixed by the Government on the basis of ability to pay, and should be paid out directly from the Budget.
- (b) A long term viable system of pricing of domestic LPG and effective targeting of subsidy can be ensured through a transparent distribution system based on the UID/Smart Card framework. Under this framework, a single price of LPG for all consumption purposes can prevail in the market, which will eliminate the scope for diversion to unintended uses. Subsidies to the targeted group such as the BPL rural households can be delivered as entitlements or through direct cash transfers to be given to the woman of the household.
- (c) Since the above mechanism is yet to be made operational, an interim measure needs to be put in place. While companies would weed out multiple connections and create a scientific data base for effective monitoring, there is a strong case to increase the price of 14.2 kg LPG cylinder by at least Rs. 100 per cylinder.
- (d) Thereafter, the price of domestic LPG should be periodically revised based on increase in paying capacity as reflected in the per capita income. The subsidy on domestic should be discontinued for all others except the BPL households once an effective targeting system is in place.

- (e) For calculation of the under-recoveries incurred by the OMCs, the present methodology based on import parity pricing be continued so long as the country remains a net importer of LPG .
- (f) The OMCs marketing domestic LPG will be compensated fully for the under-recoveries on domestic LPG as per the mechanism outlined in paragraph 4.49.

E TAXATION

4.43 At present there is zero custom duty on crude oil, domestic LPG and PDS kerosene; 2.5 percent custom duty on Motor Spirit and diesel and 5 percent custom duty on other petroleum products. The excise duty on domestic LPG and PDS kerosene has already been reduced to zero. The basic excise duty on Motor Spirit and Diesel (other than branded) has also been reduced to Rs. 13.35 per litre on Motor Spirit and Rs. 3.60 per litre on diesel. The Group has already recommended an additional excise duty on diesel-driven vehicle corresponding to the differential tax in the form of higher excise on petrol consumed by average petrol-driven car, which will act as the equaliser. There is also the cascading impact of taxes such as entry tax/octroi imposed by State Governments on crude oil, petrol and diesel. Almost 20 percent of the price build up of petroleum products is attributed to state taxes. This needs to be rationalised in order to achieve faster adaptation of domestic price of petrol and diesel to international crude price. The Empowered Committee of State Finance Ministers is already working with the Central Government to prepare a roadmap for the introduction of the Goods and Services Tax (GST) with effect from 1st April, 2010. Therefore the Group has taken a view not to give any recommendation on taxation of petroleum products.

F UNDER-RECOVERIES

4.44 The recommendations of the Committee have the following implications for the level of subsidy.

- (i) Under-recoveries due to petrol and diesel will be nil.
- (ii) Kerosene allocation would be reduced by 20 percent and would be periodically revised downwards. If PDS kerosene price is also raised by Rs.6/litre, the total reduction in under-recovery would be Rs. 5390 crore.
- (iii) Raising LPG price by Rs. 100/cylinder will reduce the under-recovery by Rs.7580 crore.

4.45 The total impact of the Group's recommendations on under-recoveries of OMCs is summarized in Table UR1. If product prices at the 2009-10 international parity are applied, the total reduction in the under-recovery will be Rs. 30,451 crore. The current estimate of 2009-10 under-recoveries is around Rs. 45,571 crore. Thus the under-recoveries will come down by 67% to Rs.15120 crore which should be quite manageable.

Table UR1: Estimates of reduction in under-recoveries on account of recommendation

Product	Measures	Annual Financial Impact (Rs. Crore)
At 2009-10 level of Under recoveries		
- Petrol	No under-recovery	5,103
- Diesel	No under-recovery	8,894
- PDS Kerosene	a) Reduction in allocation by 20%	3,484
	b) Increase in price by Rs.6/- on the reduced quantity	5,390
- Domestic LPG	Increase in price by Rs.100/Cylinder	7,580
Total		30,451

Note: Audited figures for April-December 2009 and estimates for January-March 2010.

4.46 However, 2009-10 is not a normal year in terms of price spreads. Based on the normal price spreads, and on the assumption that crude price may be anywhere between \$80/bbl to

\$140/bbl in 2010-11, the alternative calculation of residual under-recoveries have been worked out and shown in Table UR2. Without the measures suggested here, the under-recoveries on PDS kerosene and domestic LPG range from Rs. 36,500 crore at \$70/bbl to Rs.85,000 crore at \$140/bbl, and with the measures suggested here, they range from Rs. 18,700 crore to Rs. 61,800 crore. A viable financing mechanism for the under-recoveries over a range of prices is discussed in the next section.

G FINANCING THE UNDER-RECOVERIES/SUBSIDIES

4.47 One way to finance part of the under-recoveries is to levy a windfall profit tax on all upstream companies who were allotted blocks on nomination basis. The Chaturvedi Committee has suggested a special oil tax on domestic producers of crude oil on pre-NELP leases. The tax rate suggested by the Committee was 100% from a price level of \$75/bbl so as to manage the huge under-recoveries estimated for 2008-09. The Committee also recommended that once the adjustment of prices of automotive fuel was completed, the tax should be either (i) annulled or (ii) re-set downwards to equal the fuel subsidies made available only to BPL families for SKO and LPG.

4.48 ONGC made a presentation to the Committee where it has suggested the following rates:

Price Range (\$/bbl)	Rate of Tax (% of the incremental price)
60 – 70	20 %
70 – 80	40%
80 – 90	60%
Above 90	80%

4.49 It is seen that even with ONGC's suggestions, the residual under-recoveries remain stable, which can be financed by the Budget as seen from the table UR2.

Table UR 2: Financing of Under-recovery of PDS Kerosene and Domestic LPG						
	Crude Oil Price level(\$/bbl)	70	80	100	120	140
	Sale Volume - PDS SKO (Million KL)	11.7	11.7	11.7	11.7	11.7
	Sale Volume - Domestic LPG (Million Cylinder)	788.3	788.3	788.3	788.3	788.3
Under-recovery per Unit of PDS SKO & Domestic LPG						
	PDS SKO (Rs./Litre)	17.4	20.7	27.4	34.1	40.7
	Domestic LPG (Rs./Cylinders)	206.0	244.4	321.4	398.3	475.2
Total Under Recovery						
i.	PDS SKO (Rs. Crore)	20300	24200	32000	39800	47500
ii.	Domestic LPG (Rs. Crore)	16200	19300	25300	31400	37500
iii	Total (i+ii)	36500	43500	57300	71200	85000
Measures to reduce under recovery						
iv	Reduction in SKO allocation by 20%	4100	4800	6400	8000	9500
v	Increase in Price of SKO by : Rs. 6 / Litre	6100	6100	6100	6100	6100
vi	Increase in Price of LPG by : Rs. 100 / Cylinder	7600	7600	7600	7600	7600
vii	Sub-total: If all three measures adopted (iv+v+vi)	17800	18500	20100	21700	23200
viii	Balance Under recoveries after (iii-vii)	18700	25000	37200	49500	61800
ix	Contribution by upstream oil companies	1660	4980	16600	29880	43170
x	Under recoveries remaining (viii-ix)	17040	20020	20600	19620	18630
	Subsidies provided through budget *					
	a. PDS Kerosene	960	960	960	960	960
	b. Domestic LPG	1780	1780	1780	1780	1780
xi	Total (a+b)	2740	2740	2740	2740	2740
xii	Total to be financed by Government Budget (x+xi)	19780	22760	23340	22360	21370

**The amount of subsidy for PDS kerosene and Domestic LPG from budget is fixed rate of subsidy and therefore not impacted by different level of crude prices.*

4.50 We are not recommending a windfall profit tax since MOPNG ought to have flexibility in mopping up incremental incomes of ONGC and Oil India for the purpose of meeting a part of the under-recoveries of OMCs on sale of domestic LPG and PDS kerosene.

4.51 The under-recovery on account of LPG and SKO will be financed in the following manner:

- (i) As indicated in Table UR2 , the first step to contain under-recoveries/subsidies on PDS kerosene and domestic LPG is to reduce all-India allocation of PDS kerosene and increase prices of both PDS kerosene and domestic LPG
- (ii) When prices rise in the international market, and domestic retail prices are not raised, the under-recovery gap will widen. However, with the rise in prices, the estimated incremental income of ONGC / OIL will also rise.
- (iii) Therefore, the next step to finance under-recoveries of OMCs would be by way of mopping up part of the incremental income of ONGC and Oil India by way of price discounts extended to the OMCs. MOPNG has been administering this method. It provides flexibility to the Government in balancing the needs of ONGC and Oil India and the obligation to finance the under-recoveries of OMCs. Therefore, the present arrangement may be continued and incremental incomes of ONGC and Oil India can be mopped up by MOPNG in a calibrated manner
- (iv) In this manner, a sustainable pattern of financing under-recoveries on domestic LPG and PDS kerosene can be put in place by:
 - (a) Determining the under-recovery on domestic LPG and PDS kerosene based on the import parity principle;
 - (b) Effecting suitable price revisions from time to time;

- (c) Mopping 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, at the rates indicated in para 4.48; and
- (d) Providing cash subsidy from the Budget to meet the remaining gap.

H COMPETITION IN THE OIL SECTOR

4.52 A market-determined pricing system for petrol and diesel can be sustained in the long run by providing level playing field and promoting competition among all players, public and private, in the oil and gas sector. Adequate regulatory oversight is critical to ensure effective competition.

I ORDERS & NOTIFICATIONS

4.53 We have suggested a sustainable pricing system for the four sensitive products, prices of which are now controlled by the government. To give effect to this policy change, MOPNG may decide suitable amendments to the notifications and orders prescribing IPP and TPP so that any individual company will have full freedom to decide its own basis, norm or formula to derive prices of petroleum products and compete with others in the market.

V SUMMARY OF RECOMMENDATIONS

5.1 India's imports of oil are increasing. Our import dependence has reached 80 per cent and is likely to keep growing. At the same time 2008 saw an unprecedented rise in oil price on the world market. Oil price volatility has also increased. Though future oil prices are difficult to predict, they are generally expected to rise. Given our increasing dependence on imports, domestic prices of petroleum products have to reflect the international prices.

5.2 The Government has not permitted public sector oil marketing companies to pass global prices to domestic consumers. We have examined the impact of the formula-based prescriptive pricing of major petroleum products devised by the Government from time to time, particularly since 2002. The present system of price control on petrol and diesel in particular has resulted in major imbalances in the consumption pattern of petroleum products in the country, and has put undue stress on finances of the PSU oil marketing companies as well as of the Government. It has also led to withdrawal of private sector oil marketing companies from the market. This has affected competition in the domestic petroleum product market.

5.3 Intervention through price control necessitates that someone bears the financial costs. The issue therefore is to assess the costs and incidence of the burden of alternative mechanisms on different groups in the society. On whom the burden falls depends on the policy and the instruments used.

5.4 A viable long-term strategy for pricing major petroleum products is required. A viable policy has to be workable over a wide range of international oil prices and has to meet the various objectives of the government. It should limit the fiscal burden on government and keep the domestic oil industry financially healthy and competitive.

5.5 The petrol is largely an item of final consumption. An analysis of the trend of petrol consumption by the automobile owners reveals that increase in prices of petrol can be borne by

motorized vehicle owners. Accordingly, we recommend that petrol prices should be market determined both at the refinery gate and at the retail level.

5.6 We have examined the implications of increase in retail price of diesel on various groups of consumers and do not find any compelling reason to subsidize them. Therefore, we recommend the price of diesel should also be market determined both at the refinery gate and at the retail level.

5.7 Petrol and diesel used in cars, including SUVs, are for final consumption. The higher excise duty on petrol compared to diesel encourages use of diesel cars. While greater fuel efficiency of a diesel vehicle should not be penalized, a way needs to be found to collect the same level of tax that petrol car users pay from those who use a diesel vehicle for passenger transport. An additional excise duty, based on the model outlined in paragraph 4.14, should be levied on diesel car owners.

5.8 A transparent and effective distribution system for PDS kerosene and domestic LPG can be ensured through UID/Smartcards framework. Until it becomes operational, the following measures need to be taken.

5.9 There is disparity in per capita allocation of PDS kerosene amongst States, as also decline in the percentage of households using kerosene. Besides, households have flexibility in absorbing increases in price of PDS kerosene to certain extent. Therefore, PDS kerosene allocation across states should be rationalized, which will bring down all-India allocation by at least 20%. Further reduction in PDS kerosene allocation can be done on the basis of progress of rural electrification, LPG and piped gas availability which is expected to reflect much larger reductions in next NSSO surveys.

5.10 The price of PDS kerosene needs to be increased by at least Rs.6/litre so that the share of expenditure on kerosene in the total consumption expenditure of rural households remains at the same level as in 2002. Thereafter, price of PDS kerosene be raised every year in step with the growth in per capital agricultural GDP at nominal price.

5.11 Our analysis shows that prices of domestic LPG can be increased by at least Rs. 100 per cylinder. Thereafter, the price of domestic LPG should be periodically revised based on increase in paying capacity as reflected in the rising per capita income. The subsidy on domestic should be discontinued for all others except the BPL households once an effective targeting system is in place.

5.12 For calculation of the under-recoveries incurred by the OMCs on sale of PDS kerosene and domestic LPG, the extant methodology based on import parity pricing may be continued so long as the country remains a net importer of kerosene and LPG.

5.13 Following the above recommendations, the under-recoveries of OMCs due to petrol and diesel will be nil.

5.14 A mechanism for financing under-recoveries on PDS kerosene and domestic LPG has been provided in Table UR2 in paragraph 4.49. This mechanism involves periodic reduction in PDS kerosene allocation, increase in prices of PDS kerosene and domestic LPG from time to time, and mopping 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, at the rates indicated in paragraph 4.48, and providing cash subsidy from the Budget to meet the remaining gap. The OMCs marketing PDS kerosene and domestic LPG should be compensated fully for their under-recoveries based on this mechanism.

5.15 We are not recommending a windfall profit tax since MOPNG ought to have flexibility in mopping up incremental incomes of ONGC and Oil India for the purpose of meeting a part of the under-recoveries of OMCs on sale of domestic LPG and PDS kerosene as outlined in paragraph 4.49.

5.16 A market-determined pricing system for petrol and diesel can be sustained in the long run by providing level playing field and promoting competition among all players, public and

private, in the oil and gas sector. Adequate regulatory oversight is critical to ensure effective competition.

5.17 MOPNG may decide suitable amendments to the existing notifications and orders prescribing IPP and TPP so that any individual company will have full freedom to decide its own basis, norm or formula to derive prices of petroleum products and compete with others in the market.

Kirit S. Parikh

Chairman of the Expert group
Former Member, Planning Commission
Chairman, Integrated Research and Action for Development (IRADe)

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Member
Chairperson, Indian Council for Research
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Ashok Chawla,

Member
Finance Secretary, Ministry of Finance
Government of India

S. Sundareshan,

Member
Secretary, Ministry of Petroleum & Natural Gas
Government of India

Context and Terms of Reference

- 1.1 India's consumption of petroleum products has grown at an annual compound growth rate of around 4% during 2002-03 and 2008-09. In conformity with its high GDP growth India is projected to register the world's highest annual primary oil demand growth of 3.9% (against China's 3.5%) by 2030 (World Energy Outlook 2009, International Energy Agency, OECD, Paris). At present domestic production of crude oil meets around 20% of domestic demand for petroleum products. With high GDP growth and stagnant domestic oil production, India's dependence on oil imports is projected to rise to 90% by 2030. As a result, domestic costs and prices of petroleum products will be increasingly aligned to prices of oil in the international market. With this in view, the Government had notified in March 2002 that consumer prices of all petroleum products except LPG for domestic use and kerosene for public distribution system (PDS) should be determined by market factors. However, this competitive market structure envisaged in the 2002 oil sector reforms was jolted by the sharp rise in oil prices since 2004-05.
- 1.2 In March 2002, when the government launched a comprehensive oil sector reforms, the price of the Indian basket of crude oil in the international market was US\$23.3/barrel: it rose to US\$39.2/barrel in 2004-05. Since then, the unprecedented roller-coaster movement of oil prices in the international market can be judged from the following facts. It took 3 years for the oil prices to double from US\$36/barrel in July 2004 to US\$72/barrel in July 2007, but took only one year to further double to around US\$144/barrel in July 2008. Far more precipitous was the fall in prices since then when within a matter of five months, in December 2008 oil prices fell back to July 2004 level. Since then oil prices have bounced back to US\$75/barrel in December 2009.

- 1.3 In order to shield the Indian economy and consumers from the adverse impact of a volatile international oil market, the government decided to fix the consumer prices of four sensitive petroleum products, viz. petrol, diesel, domestic LPG, PDS kerosene. As the prices of these products were below their cost, government devised a compensation mechanism for the public sector oil marketing companies (OMCs). This mechanism essentially involved financial support to OMCs from other public sector upstream companies, viz. ONGC, OIL and GAIL by way of price discounts and from the government through issue of bonds.
- 1.4 During the period 2003-04 to 2008-09, the OMCs suffered under-recoveries of Rs.2,99,222 crore, which were partly compensated by the Government through issue of Oil Bonds of Rs.1,42,203 crore while the upstream oil PSUs contributed Rs.1,01,285 crore as reflected in the table below:

Table 1: Under-recoveries of OMCs and compensation by upstream companies and the Government

(Rs. Crore)

	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	Total
PDS Kerosene	3,751	9,480	14,384	17,883	19,102	28,225	92,825
Domestic LPG	5,523	8,362	10,246	10,701	15,523	17,600	67,955
Petrol	-	150	2,723	2,027	7,332	5,181	17,413
Diesel	-	2,154	12,647	18,776	35,166	52,286	1,21,029
Total Under-recovery, of which:	9,274	20,146	40,000	49,387	77,123	1,03,292	2,99,222

Upstream Sharing	3,123	5,947	14,000	20,507	25,708	32,000	101,285
Oil Bonds	-	-	11,500	24,121	35,290	71,292	142,203
Absorbed by OMCs	6,151	14,199	14,500	4,759	16,125	-	55,734

- 1.5 The above pricing and subsidy sharing mechanism resulted in a number of unsustainable outcomes. These are outlined below.
- 1.6 Fixation of prices of these essential commodities by the Government at different points of time led to speculations, hoarding, temporary shortages and above all diversion of diesel, LPG, Kerosene to unintended uses. Particularly, the demand for petrol and diesel zoomed even during 2008-09 and 2009-10 when other free products faced lower consumer demands due to industrial slow down.
- 1.7 As the authorized private sector oil marketing companies, viz. Reliance Industries, Essar Oil and Shell India were not part of the above subsidy sharing arrangement, they closed down their retail marketing business across the country. Thus, the emerging competitive structure of the domestic petroleum product market received a setback.
- 1.8 The financial strength of the public sector oil companies weakened considerably. During 2004-05 to 2008-09 ONGC and OIL provided a total price discount of Rs.91,378 crore (Table 1). Thus they could not avail the opportunity to retain the above income for investment in the crucial E&P sector. The OMCs faced the greatest challenge of remaining financially solvent. Despite the burden sharing mechanism and compensation through government bonds, OMCs barely escaped from sinking into losses during 2008-09. Even after compensation, the combined net profit of IOC, BPC and HPC during 2004-05 to 2008-09 declined by 60%.

Table 2: Profit After Tax/Net Profit of OMCs

(Rs. Crore)

Company	2004-05	2005-06	2006-07	2007-08	2008-09
IOC	4,891	*4,915	**7,499	6,963	2,950
BPC	966	292	1,806	1,581	736
HPC	1,277	406	1,571	1,135	575
Total	7,134	5,613	10,876	9,679	4261

* Includes Profit of Rs.439 crore on sale of 50% of IOC's shareholding in GAIL.

** Includes Profit of Rs.3225 crore on sale of 20% of IOC's shareholding in ONGC.

1.9 Besides, the substantial time taken by the government in processing the proposals for issue of bonds resulted in severe cash flow constraints for the OMCs. In order to meet the finances for project funding as well as for regular marketing operations, OMCs borrowed heavily from the market. As their profit earning capacity remained under strain, the OMCs credit worthiness suffered set back leading to higher interest rates on their borrowings. The combined borrowing of IOC, HPC and BPC quadrupled from Rs.23,000 crore in 2004-05 to over Rs. 1,07,115 crore by December 2009. Their debt equity ratio also deteriorated significantly thereby sapping further their ability to raise funds from the market at competitive rates.

1.10 Even the Government had to bear the brunt of this policy arrangement. Bonds with a cumulative burden of Rs 1 lakh 42 thousand crore amounted to 25 % of its annual revenue receipts in 2008-09. Clearly, the extent and manner of subsidization of the four products in the last five years has not paid off well.

Expert Committees in the past

1.11 During the period from 2005-2008, the Government tried to introduce certain formula to moderate the impact of volatility in the international oil market on the domestic prices. Apart from the Expert Committee on Integrated Energy Policy, which had also made recommendations on petroleum pricing, it also appointed two Committees to look into the entire issue of pricing and under-recovery. These aspects have been dealt with in detail in Chapter 3. During this process, a viable and sustainable pricing system for petroleum products still eluded the Government.

Terms of Reference of the Expert Group

1.12 The strategies for addressing oil price volatility and protecting the interest of the common man, which have been applied during the last five years hold important lessons for the Government as well as for the oil companies. These lessons could provide insight into a viable and sustainable pricing system for the four sensitive petroleum products. Such a system should be based on a transparent and competitive framework devoid of any distortions or imbalances which can generate long term instabilities. The present Expert Group has been constituted by the Government to advice on such a viable and sustainable system of pricing of petroleum products. According to the terms of reference prescribed by the Government (Annexure), the Expert Group would examine the current pricing policy of the four sensitive petroleum products, namely, petrol, diesel, domestic LPG and PDS kerosene. It would also examine the current taxation structure on these products and the financial health of public sector OMCs for making suitable recommendations.

Procedure

1.13 The Expert Group reviewed the reports of the earlier Committees and examined the policies adopted by the Government during 2004 -2009. It relied on empirical studies on

the role of oil futures on the spot prices in the international market and the pattern of household expenditure on motor fuels, LPG and kerosene to evaluate the extent to which the changes in rise in oil prices in international markets could be passed through to the domestic consumer prices of these products. The Group also discussed with oil companies in the public sector and private sector to assess their present financial position and future outlook as also feasibility of streamlining the present distribution system on domestic LPG and PDS kerosene.

TERMS OF REFERENCE OF THE EXPERT GROUP

F.No.P-20012/7/2009-PP

Government of India

Ministry of Petroleum & Natural Gas

(PP Section)

Shastri Bhavan, New Delhi

Dated the 31st August 2009

Subject: Constitution of an Expert Group to advice on a viable and sustainable system of pricing of petroleum products.

The Finance Minister, in his Budget Speech on 6.7.2009, had announced the setting up of an Expert Group to advise on a viable and sustainable system of pricing petroleum products. Accordingly, the Government has decided to constitute an Expert Group, with the following composition:

- | | | |
|-------|--|----------|
| (i) | Dr. Kirit S. Parikh
Former Member, Planning Commission | Chairman |
| (ii) | Dr. Isher J. Ahluwalia
Chairperson, Indian Council for Research on
International Economic Relations (ICRIER) | Member |
| (iii) | Finance Secretary, Ministry of Finance | Member |

- | | | |
|------|---|--------|
| (iv) | Secretary,
Ministry of Petroleum & Natural Gas | Member |
| (v) | Shri Suman K. Beri,
Director General, National Council of Applied
Economic Research (NCAER) | Member |

2. The Terms of Reference of the Expert Group are as follows:

To examine the current pricing policy of the four sensitive petroleum products namely Petrol, Diesel, PDS Kerosene and Domestic LPG and to make recommendations for a viable and sustainable pricing policy for these products. This may, inter-alia include:

- (a) Examination of the current taxation structure on the sensitive petroleum products, with particular reference to Petrol and Diesel and make recommendations to rationalize the taxes levied by the Central and State Governments.
- (b) Examination of the financial health of the Public Sector Oil Marketing Companies and to recommend ways of compensating them for their under-recoveries in case they are not permitted to charge market prices as a result of Government's intervention, in order to protect consumers.
- (c) Any other matter, which the Expert Group may consider necessary.

3. Secretarial assistance including office space will be provided by the Director, Petroleum Planning & Analysis Cell (PPAC). The Group will decide its own procedures and shall meet as and when necessary. The Expert Group will complete its work and submit its recommendations within a period of three months.

(Vivek Kumar)

Director

Tel. 23386965

Overview of Government Policy on Pricing of Petroleum Products²

2.1 The government policy approach on pricing petroleum products since 1970s has moved between cost-based pricing and import parity pricing (IPP). But, since 2004, the government has been setting consumer prices of petrol, diesel, domestic LPG and PDS kerosene on ad hoc basis so as to ensure petroleum price stability in the country in the face of extreme volatility in international oil markets. Yet, each policy regime gave rise to serious imbalances and change was called for. In order to establish a viable and sustainable price system for the petroleum products, it is important to assess the earlier pricing systems and draw some lessons.

2.2 In the past, the first major policy shift in pricing of petroleum products occurred in 1976, when the Government replaced IPP of the 1960s by cost-plus pricing. This came to be known as Administered Pricing Mechanism (APM), which was applied to the entire oil sector. The objective of the government was to shield the Indian economy from the high and volatile oil prices generated by the first Oil Shock in 1973-74. APM ran its course for three decades and was completely abandoned in April 2002. The major weakness of APM was that it did not induce competition in the marketplace, so it did not fulfill the consumer's interest for better products and services. Nor did it enable domestic oil companies to generate adequate financial resources for project development and capacity addition in this crucial sector.

2.3 Moreover, the self-balancing nature of the Oil Pool mechanism was based on the premise that any increase in the cost was required to be fully passed on to the consumer prices. In 1990s, the government did not permit full pass through. It resulted in a huge Oil Pool deficit, which weakened the financial position of the public sector oil companies. It also placed a heavy financial burden on the Government by way of issuing oil bonds to PSU oil companies.

2 Prepared by Petroleum Planning and Analysis Cell

2.4 In 1995, Government appointed a Strategic Planning Group on Restructuring of the oil industry (R Group) under Vijay Kelkar to examine the strengths and weaknesses of the oil industry and develop a strategic plan for reform. The Group found major deficiencies of APM in making the domestic petroleum sector viable and globally competitive. According to the Group, APM could not generate sufficient financial resources for oil companies to make the required investment for energy security. APM did not provide incentive either for cost minimization or for technological improvement. Since all costs were reimbursed there was no incentive to make profitable investments. The subsidies and cross subsidies built in the APM resulted in wide distortions in consumer prices. In view of these serious infirmities APM was finally dismantled in March 2002.

2.5 The process of dismantling of APM and operationalisation of market determined pricing mechanism was notified in two successive Government resolutions in 1997 and in 2002. The 1997 resolution provided the four year phasing out of APM and the 2002 resolution completed the process. The approach to pricing in this new policy framework was based on four distinct considerations.

- (i) The price of indigenous crude oil would be market determined
- (ii) The prices of petroleum products produced by the refineries will be based on import parity price.
- (iii) The consumer prices of all other products except domestic LPG and PDS kerosene will be market determined.
- (iv) There would be flat rate subsidies on PDS kerosene and domestic LPG.

Mechanism to mitigate volatility in oil prices

2.6 The petroleum pricing reforms analysed above, except APM, did not have any mechanism to manage extreme volatility in oil prices. Even the effectiveness of APM as a self-balancing mechanism was based on the premise that any increase in the costs of PSU oil

companies on account of crude oil production, import, refining and marketing based on the pre-determined formula should be fully reflected in the consumer prices.

2.7 During April 2002 to January 2004 oil companies changed the domestic consumer prices of petrol and diesel and domestic LPG based on market factors. However, kerosene price was not changed. As oil prices started moving upward in 2004, the question of smoothing the volatility in international prices assumed importance.

2.8 The period from 2004 to 2008 witnessed three distinct policy phases to address oil price volatility:

- (a) First, the Government devised a **price band mechanism** in July 2004. The Government gave limited freedom to oil marketing companies to revise retail prices within a band of +/-10% of the mean of rolling average of last 12 months and last 3 months of international C&F prices. In case of international prices breaching this band, the matter would be taken up with Ministry of Finance for modulation in excise duty rates. The above price band was operated only once effective 1st August 2004 when prices of petrol and diesel were increased by Rs.1.10 per litre and Rs.1.42 per litre, respectively. However, as oil prices rose sharply and there was uncertainty in international oil markets, the price band mechanism was abandoned.
- (b) In October 2005, the Government constituted the Rangarajan Committee to examine the pricing and taxation of petroleum products with a view to stabilizing their prices and establishing transparent mechanism for autonomous adjustment of prices by the oil companies. The Committee recommended a formula of **trade parity pricing** (TPP) for petrol and diesel at refinery level as well as at retail level. The formula was a weighted average of import parity and export parity prices, in which the percentage share of import/export of these products provided the weights. The Committee suggested that

these TPP prices should serve as indicative ceilings within which the marketing companies would have flexibility to fix the actual retail prices of petrol and diesel. As regards subsidies, the Committee recommended elimination of subsidy on LPG and its restriction of kerosene subsidy to BPL families.

- (c) The Government implemented switching over to TPP and rationalised taxes on crude oil, petrol and diesel, but could not implement rationalization of subsidies and other changes recommended by the Committee. Even TPP was confined to the refinery level and the retail prices of petrol, diesel, domestic LPG and PDS Kerosene fixed by the Government remained below their TPP levels.
- (d) As PSU oil marketing companies (OMCs) kept selling these products below their TPP-based costs, the Government devised a burden sharing mechanism to meet OMCs under-recoveries. This mechanism involved PSU upstream oil companies (viz., ONGC, OIL and GAIL) which extended hefty price discounts on their sale of crude oil to the OMCs, and the government which issued bonds every year. Continuance of such an arrangement, year after year, became unsustainable. It lacked transparency and thereby gave rise to financial uncertainty. It was fraught with administrative delays and thereby did not help the oil companies either. Moreover, it only facilitated transferring the present problem to the future.
- (e) As international oil prices kept rising since June 2006, the Government did not increase the retail prices of petrol and diesel till June 2008. As a result, the under-recoveries of PSU oil marketing companies (OMCs) reached unsustainable levels in 2008. At that stage the Government appointed the Chaturvedi Committee to look into the financial conditions of the companies, review the concept of under-recoveries and examine the available options for burden sharing by all stakeholders.

- (f) The Chaturvedi Committee concluded that as long as there are price restraints there will have to be a formula. However, the formula for refinery gate prices of petrol, diesel, domestic LPG and PDS kerosene should be based on FOB export prices (and not on TPP). The full price adjustments should be made within a period of 9 months for petrol and 24 months for diesel. Once these price adjustments are completed the Government should disengage from the process of pricing of petroleum products and allow price to be an outcome of a competitive process.

- (g) The Chaturvedi Committee reiterated the views of the Rangarajan Committee that subsidies should be given to BPL family only. Such subsidies should be disbursed through Smart Cards or cash transfers and not through supply of products much below their market prices. The existing subsidy on LPG should be eliminated in a period of three years.

- (h) The pricing mechanism recommended by the Chaturvedi Committee was primarily meant to address the financial challenges associated with very high and unsustainable level of under-recoveries of oil marketing companies who were not permitted to pass the rise in oil prices on to the consumer prices. Once oil prices in the international market slumped in the second half of 2008, the magnitude of under-recovery burden came down significantly.

- (i) The integrated energy policy based on the recommendations of Expert group headed by Kirit Parikh, were approved by the Cabinet in December 2008. It recommended Trade parity pricing as one which reflects the opportunity costs of a consumer or a producer. It further stipulates that IPP is to be used for a product for which the country is a net importer and EPP for a product for which it is a net exporter. As long as the country exports a particular product, EPP equals TPP.

- (j) The Trade parity pricing was also recommended by the Parikh Committee on Integrated Energy Policy (August 2006) as one which reflects the opportunity costs of a consumer or a producer. According to the Integrated Energy Policy, IPP is to be used for a product for which the country is a net importer and EPP for a product for which it is a net exporter. As long as the country exports a particular product, EPP equals TPP, as suggested by the Integrated Energy Policy

Conclusion

2.9 The foregoing analysis of the Government policies on pricing of four sensitive petroleum products leads to the following conclusions:

- (a) Explicit formula-based pricing mechanism of petroleum products is not conducive to establishing a long-term viable and globally competitive oil industry in the country.
- (b) As more than 3/4th of the current domestic crude oil requirements is met by imports and is expected to go upto further in the future, the domestic consumer prices of petroleum products should be increasingly aligned with movements in international oil markets.
- (c) Any ad hoc system of price fixation by the government may provide a semblance of domestic price stability in the immediate-to-short term, but give rise to serious long-term instabilities in the demand-supply conditions in the country, competitive functioning of oil companies, and fiscal soundness of the government.
- (d) A viable and sustainable pricing system for petroleum products is a key requirement of stable, long-term growth of the economy. Similarly, a financially strong and globally competitive oil industry provides an enduring platform to strengthen energy security of the country. It is therefore important that oil companies should have the freedom to set prices based on competitive market conditions. The government needs to extend subsidy to the targeted consumers in such a manner which does not impinge on the freedom of oil companies to set prices in the market place.

Oil Price Volatility in Recent Years and Government Interventions³

3.1 The unprecedented spike in oil prices and general worsening of economies in 2007-08 led to government interventions in oil price setting in many developing countries. Such interventions took many forms, such as price control, reduction in taxes, increase in fuel subsidies, operation of Price Stabilization Fund, fuel procurement by the government, enforcement of law to lower prices by companies. The World Bank, IMF, UNDP and international energy consulting agencies have brought out reports and articles on the methods applied by the various governments for smoothing domestic petroleum prices. These methods are examined below.

3.2 Barring the OECD countries, which typically left oil prices to be determined in the markets, there was either direct or indirect government interventions on petroleum price setting in countries across the world. Most of the developing countries (surveyed by IMF/World Bank) followed a **“direct and discretionary” approach** to setting domestic petroleum prices, by which the governments fixed prices at different times and permitted a limited pass through of international prices to the domestic consumers. A limited number of low-income countries opted for automatic pass through mechanism based on an explicit pricing formula. But, even these countries came under severe pressure to suspend/abolish automatic pass through mechanism when oil prices sky-rocketed in 2008.

3.3 However, once the sky rocketing prices began its climb down in the second half of 2008-09 and touched its nadir in December 2008, certain countries slackened their grip on petrol and

³Prepared by Petroleum Planning and Analysis Cell

diesel prices, introduced pricing formula, announced reduction/streamlining of subsidies and indicated price liberalization measures. The broad forms of such measures are examined below.

(a) Formula-Based Pricing

3.4 Prior to the super oil price spike in 2007-2008, many developed countries had liberalized petroleum product pricing by establishing formula for pricing which could facilitate automatic price revisions by companies. Generally, the formula-based pricing system has the following variants.

(i) Import Parity / Export Parity Pricing*

- ✓ Linked to a single international port (e.g. Arab Gulf by India since 2002)
- ✓ Linked to multiple international ports (weighted average of prices at three ports, i.e., Rotterdam, New York and Singapore by China during 2001- 2004))
- ✓ Linked to product prices in international markets (eg. China 2006)
- ✓ Linked to crude prices in international markets (eg. China from 19 Dec. 2008)

**Even in countries where policy does not prescribe explicitly any IPP formula, the companies tend to use IPP (when a country is a product importer). In other countries where IPP is accepted as a Government policy there are variations in including or excluding certain cost items under IPP.*

(ii) Price Ceilings

- ✓ While prices are linked to world prices, **the government sets the price ceilings in line with (changes in) world prices** (Ghana, 2005)

(b) Price Smoothing Options

3.5 The following options have been used singly or jointly by countries:

- i. Generally, price revisions are made on monthly/ fortnightly basis. In certain countries, products like LPG are excluded from periodic price revisions (Senegal)
- ii. Adjustments in domestic prices are called for when the price movement based on the formula exceeds a certain per cent, e.g. 5% in Malawi, 3% in Mozambique.
- iii. A moving average of international prices with or without bands has been applied.

Price bands

3.6 According to **IMF Memo dated 30 May 2009** (which has been circulated to Members on 17.11.2009) the Price band can have two variants:

- **Max-Min rules:** These rules specify a band around a central price. If the retail price (computed with a cost-plus formula) is above the band's ceiling, the government absorbs the difference between the two prices by paying out a subsidy and setting the retail price at the upper level of the band. If the retail price computed as indicated before is below the minimum price set by the band, the government taxes away the difference and sets retail prices at the minimum level. Chile implemented this mechanism but was forced to adjust it significantly given its high fiscal cost.
- **Trigger rules:** Retail prices are adjusted whenever the current formula price change exceeds a certain trigger band (e.g., plus or minus 10 percent around the current price). Whenever, the retail prices are adjusted, the price band shifts up or down depending on the adjustment. The band does not need to be symmetric. Bolivia and Costa Rica implemented this option but it was not consistently applied. In particular, in Bolivia, it was suspended when oil prices started to increase in 2000 and domestic petroleum prices have been frozen since then.

Compensation Mechanisms

Price Stabilization Fund

3.7 The Price Stabilization Fund is based on the notion that smoothing of consumer prices can be made by the Fund which is self-balancing between periods of low prices vis-à-vis high prices. When international prices are low, the domestic prices are not lowered, which provides inflows to the Fund. Conversely, when international prices rise, the domestic prices are not raised and companies are compensated from the Fund. Ideally, the fund can be self-balancing if, for example, the oil prices were mean-reverting. However, this strategy does not work, when oil prices rise steadily over a longer period, e.g. the price rise between January 2004 and August 2008. Several countries including Argentina (for LPG and natural gas), Chile, Colombia, Ethiopia, Peru and Thailand have Price Stabilization Funds. Two examples can explain how the Fund can be sustained.

- (a) **Peru operated a classic price-smoothing fund since 2004.** The price of each fuel was allowed to fluctuate within a price band with a ceiling and a floor. When the market-based price was lower than the floor, the difference was deposited into the Fund. Conversely, when the market-based price was higher, the Fund reimbursed fuel suppliers. The Fund was effective for 180 days at a time, which means, it needed to be renewed/extended. During the super price spike in 2006-2008, the fund ran into deficits. The total subsidy since the Fund's inception amounted to \$1.5 billion, half of which was offset by transfer from the Govt. Budget.

- (b) **The other example of a Fund which remained surplus during 2008 is by Thailand.** Historically, Thailand's oil fund has been cross-subsidizing LPG. In 2004, it was used to subsidize petrol and diesel also. However, the Fund stopped subsidizing LPG in December 2007; instead, it is now subsidizing biofuels. Because the Thai government did not opt for large-scale price subsidies in 2008, as compared with 2004 and 2005, the Fund managed to remain surplus.

Price Subsidies

3.8 To reduce the impact of high oil prices, governments applied subsidies which are applied to all customers as also those which are targeted to specific class of customers. **Agriculture, public and goods transport, and fisheries are some important sectors which received fuel subsidy.**

Country	Subsidy
Malaysia	Additional fuel price subsidies to Fishermen, Vessels, transport operators with Fleet Cards .
Thailand	The cabinet approved in March 2008, a price subsidy for diesel used in fishing. Effective July 2008, excise taxes on several refined products were reduced to <u>zero</u> . Specific taxes were also reduced.
Bangladesh	Diesel subsidies to farmers
Kazakhstan	Allocates diesel fuel for farmers at below-market prices
Chile	The combined impact of fuel subsidy from the Price Stabilization Fund and the lower excise tax intended to lower petrol prices by more than 15%. Besides, the rebate on diesel excise tax for the Truckers was enhanced from 25% to 80% for one year.
Nepal	Dual Pricing of diesel in Kathmandu city by segregating pumps. But, the policy was abandoned in 2 months.

Rationing

3.9 Limiting availability of subsidized fuels has been adopted by countries to reduce the financial burden. Iran was a prime example of rationing petrol in June 2007. There were different monthly quotas for different class of vehicles. The government set up a smart card system to monitor fuel consumption by different class of vehicles.

3.10 Malaysia has been operating a Smart Card system for fishing vessels and transport operators who can buy discounted fuels under quota system. Other countries like Indonesia, Nepal and Rwanda also used rationing of fuels.

Level Playing field for Private Sector Companies

3.11 In order to facilitate compensation to private sector companies, along with the PSUs for selling fuels at subsidized prices, Nigeria set up a Petroleum Support Fund in January 2006. The difference between fuel import costs (actual) and the domestic prices was reimbursed from the Fund. In practice, **the Fund has been financed by the government from inception**. The Nigerian PSU, NNPC, received 80% of total subsidy on petrol, diesel and kerosene.

Consequences of Price Control etc.

3.12 Government control of petroleum product prices can have several adverse consequences including the following:

- (a) Artificially low prices can widen long term supply-demand imbalances by discouraging refiners and marketers to expand capacity and, on the other hand, encouraging demand growth.
- (b) Fuel shortages are nearly universal when prices are kept low.
- (c) Market malpractices like hoarding, black marketing, adulteration thrive when prices are controlled arbitrarily.
- (d) Major oil exporters that subsidize petroleum product prices can actually become product importers for lack of investment in the downstream sector. Iran, Iraq, Nigeria and Mexico are prime examples.
- (e) Cross-border price difference tends to widen when prices are kept low; it encourages “fuel tourism”.

Analysis of consumption pattern of kerosene and LPG

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This analysis is based on the consumption expenditure survey of NSSO for the 61st round (2004-05). The analysis has been done separately for rural and urban areas. Similar analysis at state level can also be done.

For the analysis, deciles are created deciles by consumption expenditure in each sector that is rural and urban areas. These deciles are based on the monthly per capita consumption expenditure estimates on uniform recall period (URP).

There are total seven tables for each sector (rural and urban). The first table is based on the question that is asked in the consumption survey regarding the primary source of energy for cooking. Similar question is asked about the primary source of lighting in Table 2.

The third table gives similar information but based on actual reported consumption of LPG and kerosene. The consumption expenditure surveys of NSSO distinguish between kerosene purchased from the public distribution system (PDS) and those purchased from other sources. This distinction is kept in subsequent analysis. The percentages reported here would be higher than the corresponding estimates in table 1 and 2 simply because there are some households which will be consuming LPG and Kerosene but may not be using it as the primary source for energy or cooking.

The main objective of the exercise was to look at discretionary expenditure of households along with their expenditure on LPG and kerosene. However, before doing that we need to define what we mean by discretionary expenditure. For this analysis, expenditure on food, clothing, footwear, education and health are taken as essential expenditure. The tables 4 to 7 give expenditure by broad expenditure groups for the deciles for entertainment, personal effects, toilet articles, sundry articles, consumer services and conveyance. While all these broad heads are easily defended as discretionary expenditure, there is some ambiguity regarding taking conveyance as discretionary expenditure considering that conveyance may be essential for commuting for livelihood purposes. Also given at the end is the total household expenditure by 30 day recall period. The items included in each of these sub-heads are given at the end of this note.

For table 4, even those households who are not consuming LPG or kerosene are included for calculating the average expenditures. For these households, it is assumed that expenditure on these items is zero. However, these items have not been excluded from the analysis.

For table 5, 6 and 7 give the same estimates but in these cases, only those households who actually report consumption for LPG or kerosene are included. So table 5 includes only those households which report positive consumption for LPG. Similarly, table 6 and 7 include only those households which have reported positive consumption for kerosene.

Table 8 gives distribution of households by source of kerosene consumption, and tables 9 and 10 give quantities and values of kerosene consumption from different sources.

Description of items included in discretionary expenditure

entertainment	sundry articles	conveyance
cinema, theatre	electric bulb, tubelight	air fare
mela, fair, picnic	batteries	railway fare
sports goods, toys, etc.	other electric goods	bus/tram fare
club fees	earthenware	taxi, auto-rickshaw fare
recreation and hobbies	glassware	steamer, boat fare
photography	other plastic goods	rickshaw fare
video cassette/ VCR/ VCP(hire)	coir, rope, etc.	horse cart fare
cable TV connection	washing soap/soda	porter charges
other entertainment	other washing requisites	petrol
	agarbati	diesel
personal care and effects	flowers (fresh): all purposes	lubricating oil
spectacles	insecticide, acid, etc.	school bus/van
torch	other petty articles	other conveyance expenses
lock		
umbrella, raincoat	consumer services	
lighter (bidi/ cigarette/ gas stove)	domestic servant/cook	
other goods	sweeper	
	barber, beautician, etc.	
toilet articles	washerman, laundry, ironing	
toilet soap	tailor	
toothbrush, toothpaste, etc.	priest	
powder, snow, cream, lotion	legal expenses	
hair oil, shampoo, hair cream	postage & telegram	
comb	telephone charges	
shaving blades,	repair charges	
shaving cream	grinding charges	
sanitary napkins	miscellaneous expenses	
other toilet articles	pet animals (incl. birds, fish)	
	other consumer services	

RURAL

Table R1: Percentage of households within each decile reporting primary source of energy for cooking

% within ntiles of mpce30day by sector

ntiles of mpce30day by sector	cookingcode					Total
	firewood	LPG	dung cake	kerosene	others	
1	80.8%	.2%	8.7%	.3%	9.9%	100.0%
2	83.1%	.3%	9.6%	.7%	6.3%	100.0%
3	82.2%	.8%	10.5%	.5%	6.0%	100.0%
4	81.8%	1.7%	10.4%	.9%	5.3%	100.0%
5	80.2%	3.0%	9.8%	.8%	6.2%	100.0%
6	79.9%	4.4%	10.5%	.6%	4.6%	100.0%
7	79.4%	5.7%	9.3%	.9%	4.6%	100.0%
8	76.9%	9.0%	8.0%	1.5%	4.6%	100.0%
9	68.8%	15.9%	8.2%	2.0%	5.1%	100.0%
10	50.2%	33.5%	7.0%	3.4%	5.9%	100.0%
Total	75.3%	8.6%	9.1%	1.3%	5.8%	100.0%

Table R2: Percentage of households within each decile reporting primary source of energy for lighting

% within ntiles of mpce30day by sector

Ntiles of mpce 30day by sector	lightcode			Total
	kerosene	electricity	others	
1	69.4%	29.7%	.9%	100.0%
2	64.5%	35.0%	.5%	100.0%
3	59.1%	40.3%	.6%	100.0%
4	54.2%	45.0%	.7%	100.0%
5	50.3%	49.1%	.6%	100.0%
6	46.1%	53.3%	.7%	100.0%
7	40.7%	58.6%	.7%	100.0%
8	36.0%	63.5%	.5%	100.0%
9	27.4%	72.1%	.5%	100.0%
10	16.3%	83.1%	.6%	100.0%
Total	44.4%	55.0%	.6%	100.0%

Table R3: Percentage of households actually consuming in the last 30 days

of mpce30day by sector	kerosenpds	keroseneother	LPG
1	73.7	27.4	.3
2	78.3	28.0	.3
3	78.7	29.3	1.0
4	76.9	30.7	2.4
5	76.9	30.2	3.5
6	75.5	30.3	5.6
7	74.6	28.9	8.0
8	73.9	27.2	12.5
9	69.2	24.0	21.8
10	57.1	20.9	45.3
Total	72.8	27.4	11.7

Table R4: Average consumption by commodity groups for each decile

In this table anybody not consuming LPG and kerosene have been assigned zero consumption but are taken into while calculating averages.

		value_lpg	value.kerosene.pds	value.kerosene.other	value_entertainment	value_personal_effects	value_toilet_articles	value_sundry_articles	value_consumer_services	value_convoyance	Total household consumption
		Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean
ntiles of mpce3 Oday by sector	1	.40	20.96	8.52	26.8	21.2	42.5	34.4	42.8	42.5	1316.44
	2	.54	24.93	9.74	31.8	24.8	51.8	44.2	54.2	50.9	1681.21
	3	1.58	25.35	10.73	36.7	29.5	57.2	48.5	60.2	56.8	1856.19
	4	3.47	25.31	11.77	38.5	29.2	60.6	53.1	65.5	65.6	2026.05
	5	6.13	25.69	11.91	44.6	31.1	66.6	57.3	69.8	75.3	2191.71
	6	10.64	25.31	12.43	47.9	33.7	70.6	61.1	79.2	85.1	2395.00
	7	14.31	25.26	12.20	54.4	41.4	75.0	65.2	88.1	102.7	2580.81
	8	23.17	25.09	12.50	64.9	45.5	81.6	70.1	101.3	121.4	2839.97
	9	41.16	24.06	12.43	79.0	56.5	90.4	79.1	139.3	173.0	3316.16
	10	88.82	19.92	12.23	134.2	83.4	113.8	101.5	285.5	369.8	5675.30

Table R5: average consumption by commodity groups for each decile

This table is only for those households which have reported positive consumption for LPG

		value_lpg	value_entertainment	value_personal_effects	value_toiletarticles	value_sundryarticles	value_consumer_services	value_conveyance	Total household consumption	Cylinders /Yr
		Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean
ntiles of mpce30day by sector	1	125.2	68.0		64.4	40.2	56.0	58.0	1501.8	5.17
	2	163.7	70.3	20.0	89.5	78.1	102.8	105.9	2928.6	6.62
	3	153.1	60.9	12.7	81.1	56.9	87.8	105.3	2367.7	6.18
	4	145.9	65.0	24.5	84.2	64.7	90.7	97.4	2369.5	5.98
	5	176.6	69.0	36.1	98.7	73.9	101.4	127.5	2793.3	7.09
	6	189.1	74.4	31.6	99.4	76.5	108.1	122.3	2952.0	7.53
	7	179.9	79.1	53.3	102.3	82.6	119.7	166.2	3111.7	7.27
	8	185.0	87.4	41.3	113.5	88.4	150.3	192.1	3493.5	7.41
	9	189.0	93.2	56.6	120.4	96.9	204.3	255.8	3971.5	7.56
	10	196.1	154.2	101.2	142.3	122.2	396.9	499.2	6597.5	7.91

Table R6: average consumption by commodity groups for each decile

This table is only for those households which have reported positive consumption for Kerosene from PDS

		value.kerosene.pds	value_entertainment	value_personal_eff	value_toiletarti	value_sundryarti	value_consumer_ser	value_conveya	Total
		Mean	Mean	Mean	Mean	Mean	Mean	Mean	household
		Mean	Mean	Mean	Mean	Mean	Mean	Mean	consumpti
		Mean	Mean	Mean	Mean	Mean	Mean	Mean	on
		Mean	Mean	Mean	Mean	Mean	Mean	Mean	on
ntiles of mpce30d ay by sector	1	28.4	26.5	20.9	43.1	35.5	43.4	41.8	1386.6
	2	31.8	32.3	23.8	51.8	44.3	54.3	51.3	1713.4
	3	32.2	35.8	29.9	57.3	48.9	61.3	56.8	1888.9
	4	32.9	39.9	28.4	60.5	53.5	65.9	65.4	2061.2
	5	33.4	43.6	29.1	66.8	58.1	69.8	76.4	2222.5
	6	33.5	46.3	33.6	70.7	61.8	80.1	86.1	2439.6
	7	33.8	52.3	37.8	74.2	65.3	89.2	103.1	2612.8
	8	33.9	62.3	45.1	80.3	70.0	100.2	119.0	2873.1
	9	34.8	76.2	56.7	88.2	78.8	136.5	168.7	3386.8
	10	34.9	114.7	84.6	105.6	99.2	257.8	329.8	5872.1

Table R7: average consumption by commodity groups for each decile

This table is only for those households which have reported positive consumption for Kerosene from sources other than PDS

		value.kerosene .other	value_entertain ment	value_personal_ef fects	value_toiletarti cles	value_sundryarti cles	value_consumer_ser vices	value_conveya nce	Total household consumpti on
		Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean
ntiles of mpce30d ay by sector	1	31.1	23.7	24.0	42.2	35.1	43.7	41.8	1399.7
	2	34.8	26.5	25.2	51.1	44.3	57.3	47.8	1737.9
	3	36.6	29.6	30.1	57.4	47.7	62.6	51.3	1945.3
	4	38.4	27.7	31.1	58.1	50.9	63.7	58.9	2041.2
	5	39.5	37.1	31.1	64.8	54.9	70.3	66.3	2256.1
	6	41.0	38.8	33.8	70.4	59.0	78.2	77.0	2407.7
	7	42.2	46.5	41.2	74.2	63.9	81.9	88.7	2645.0
	8	46.0	56.4	49.4	80.5	67.8	93.4	101.1	2872.8
	9	51.7	69.7	58.3	86.7	74.6	130.2	145.4	3245.4
	10	58.4	121.7	75.9	107.3	92.9	234.4	322.7	5423.9

Table R8: Percentage Distribution of households by category of kerosene consumption

		Percent
Neither PDS nor Other Sources	1	10.5
Only from other sources	2	16.6
Only from PDS	3	62.0
Both PDS and Other sources	4	10.8
	Total	100.0

Table R9: Quantity of Kerosene consumed per household in a month (in litres)

		households by category of kerosene consumption									
		Neither PDS nor Other Sources		Only from other sources		Only from PDS		Both PDS and Other sources		Total	
		quantity.kerosene.pds	quantity.kerosene.other	quantity.kerosene.pds	quantity.kerosene.other	quantity.kerosene.pds	quantity.kerosene.other	quantity.kerosene.pds	quantity.kerosene.other	quantity.kerosene.pds	quantity.kerosene.other
		Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean
ntiles of mpce30d ay by sector	1	.	.	.	2.20	2.73	.	2.50	1.69	2.70	2.05
	2	.	.	.	2.39	3.12	.	2.72	1.73	3.07	2.15
	3	.	.	.	2.39	3.16	.	2.89	1.88	3.12	2.18
	4	.	.	.	2.64	3.22	.	2.85	1.82	3.16	2.31
	5	.	.	.	2.67	3.27	.	2.87	2.04	3.21	2.40
	6	.	.	.	2.60	3.36	.	2.96	2.31	3.29	2.48
	7	.	.	.	2.68	3.34	.	2.87	2.17	3.26	2.45
	8	.	.	.	3.02	3.36	.	2.85	2.39	3.28	2.75
	9	.	.	.	3.17	3.43	.	3.09	2.79	3.39	3.02
	10	.	.	.	3.58	3.42	.	3.11	3.08	3.39	3.42
	To tal	.	.	.	2.75	3.25	.	2.88	2.19	3.20	2.53

Table R10: Value of kerosene consumed per household in a month (Rs)

		households by category of kerosene consumption									
		Neither PDS nor Other Sources		Only from other sources		Only from PDS		Both PDS and Other sources		Total	
		value.kerosene.pds	value.kerosene.other	value.kerosene.pds	value.kerosene.other	value.kerosene.pds	value.kerosene.other	value.kerosene.pds	value.kerosene.other	value.kerosene.pds	value.kerosene.other
		Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean
ntile s of mpc e30 day by sect or	1	.	.	.	32.61	28.60	.	27.26	27.59	28.45	31.08
	2	.	.	.	36.27	32.18	.	29.56	32.12	31.84	34.78
	3	.	.	.	37.09	32.44	.	30.93	36.02	32.20	36.65
	4	.	.	.	40.53	33.57	.	29.65	35.21	32.93	38.36
	5	.	.	.	41.87	33.90	.	31.10	36.27	33.43	39.50
	6	.	.	.	41.63	34.12	.	30.57	40.05	33.52	40.96
	7	.	.	.	43.00	34.50	.	30.70	41.30	33.85	42.25
	8	.	.	.	46.74	34.60	.	30.39	44.96	33.94	45.97
	9	.	.	.	52.13	35.09	.	32.85	51.09	34.79	51.73
	10	.	.	.	59.23	35.14	.	32.97	56.69	34.89	58.42
	T o t a l	.	.	.	43.39	33.51	.	30.67	40.32	33.09	42.18

URBAN

Table U1: Percentage of households within each decile reporting primary source of energy for cooking

% within ntiles of mpce30day by sector

		cookingcode					Total
		firewood	LPG	dung cake	kerosene	others	
ntiles of mpce30day by sector	1	66.1%	8.6%	5.4%	6.8%	13.1%	100.0%
	2	53.3%	22.2%	3.6%	10.3%	10.6%	100.0%
	3	43.1%	33.2%	3.6%	13.1%	7.1%	100.0%
	4	31.6%	42.1%	2.3%	15.6%	8.4%	100.0%
	5	25.0%	54.1%	2.4%	11.5%	7.0%	100.0%
	6	16.4%	62.7%	1.6%	12.9%	6.4%	100.0%
	7	9.2%	70.3%	.7%	12.9%	6.9%	100.0%
	8	6.7%	74.9%	.3%	10.2%	7.9%	100.0%
	9	2.7%	78.4%	.3%	8.5%	10.2%	100.0%
	10	1.4%	82.0%	.2%	4.1%	12.3%	100.0%
Total		21.7%	57.2%	1.7%	10.2%	9.1%	100.0%

Table U2: Percentage of households within each decile reporting primary source of energy for lighting

% within ntiles of mpce30day by sector

		lightcode			Total
		kerosene	electricity	others	
ntiles of mpce30day by sector	1	31.9%	66.8%	1.4%	100.0%
	2	17.5%	81.7%	.8%	100.0%
	3	10.6%	88.1%	1.3%	100.0%
	4	8.7%	90.9%	.4%	100.0%
	5	6.2%	93.2%	.5%	100.0%
	6	4.8%	94.7%	.5%	100.0%
	7	2.7%	97.0%	.2%	100.0%
	8	1.8%	97.8%	.4%	100.0%
	9	.9%	99.0%	.1%	100.0%
	10	.3%	99.2%	.4%	100.0%
Total		7.1%	92.3%	.5%	100.0%

Table U3: Percentage of households actually consuming in the last 30 days

ntiles of mpce30day by sector	kerosenpds	keroseneother	LPG
1	56.4	34.5	9.3
2	56.8	34.4	23.9
3	51.6	32.0	36.3
4	48.5	31.5	45.5
5	39.7	27.5	56.5
6	32.9	27.8	64.2
7	29.0	22.8	72.2
8	20.4	21.4	76.3
9	16.2	16.0	79.1
10	8.6	8.9	82.7
Total	32.8	24.1	58.9

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Table U4: average consumption by commodity groups for each decile

In this table anybody not consuming LPG and kerosene have been assigned zero consumption but are taken into while calculating averages.

		valu e_lp g	value.k erosen e.pds	value.kero sene.other	value_ente rtainment	value_perso nal_effects	value_toil etarticles	value_su ndryartic les	value_con sumer_ser vices	value_c onveya nce	Total household consumptio n
		Mea n	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean
ntiles of	1	19.1	23.11	18.30	62.0	25.2	63.4	50.2	59.3	64.6	1890.17
mpce3	2	53.1	24.41	21.17	76.3	29.4	79.7	63.9	75.7	82.6	2440.03
0day	3	85.1	23.37	28.38	92.7	30.9	88.8	72.8	90.8	109.8	2762.88
by	4	108.	24.83	30.78	103.5	39.2	98.8	81.4	120.6	148.7	3097.47
sector	5	138.	19.50	26.53	113.2	46.4	106.0	88.1	146.5	178.9	3421.13
	6	163.	16.68	30.09	128.9	55.2	117.5	97.4	199.2	231.8	3857.55
	7	179.	14.36	25.16	142.2	62.1	124.3	104.3	242.9	285.7	4217.44
	8	194.	9.50	21.71	157.6	71.5	133.8	114.1	318.7	349.0	4725.37
	9	203.	6.86	14.85	176.5	87.1	147.9	126.2	469.7	468.8	5608.48
	10	206.	3.64	8.18	233.6	138.1	188.4	166.3	1028.1	930.1	9769.66

Table U5: average consumption by commodity groups for each decile

This table is only for those households which have reported positive consumption for LPG

		value_lpg	value_entertainment	value_personal_effects	value_toiletries	value_sundryarticles	value_consumer_services	value_conveyance	Total household consumption	Cylinders/Yr
		Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean
ntiles of mpce30 day by sector	1	205.85	93.2	25.0	82.3	61.3	75.6	76.2	2378.00	8.17
	2	222.13	101.6	29.1	96.6	73.8	97.2	97.4	2816.83	9.10
	3	234.92	111.4	34.8	104.5	81.0	118.4	135.7	3132.27	9.35
	4	239.14	115.7	40.4	114.1	94.0	162.0	176.4	3542.57	9.60
	5	244.99	123.1	47.7	121.9	99.6	182.1	204.9	3853.14	9.79
	6	255.32	139.5	60.1	134.9	110.2	247.6	264.8	4390.94	10.29
	7	248.70	152.1	66.3	139.8	116.1	287.9	320.9	4677.76	10.19
	8	255.22	167.6	72.4	150.9	129.6	374.8	397.9	5269.95	10.17
	9	256.90	185.1	90.7	166.8	142.6	549.8	526.2	6304.17	10.37
	10	249.98	246.8	144.7	207.5	185.3	1173.1	1032.5	10818.79	10.17

Table U6: average consumption by commodity groups for each decile

This table is only for those households which have reported positive consumption for Kerosene from PDS

		value.kerosene.pds	value_entertainment	value_personal_effects	value_toiletries	value_sundryarticles	value_consumer_services	value_conveyance	Total household consumption
		Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean
ntiles of mpce30 day by sector	1	40.95	66.4	27.6	64.5	51.9	62.1	63.1	2016.02
	2	42.97	72.1	29.0	79.9	64.6	78.6	79.3	2478.15
	3	45.29	93.2	32.9	88.1	72.7	89.8	102.3	2761.77
	4	51.17	95.4	38.4	97.5	81.8	116.3	142.0	3146.92
	5	49.09	109.4	48.8	99.1	86.0	135.9	163.0	3444.50
	6	50.69	117.1	49.1	112.7	93.3	180.9	219.2	3953.11
	7	49.52	144.7	72.9	118.8	103.1	215.0	255.1	4428.57
	8	46.57	142.1	88.4	128.5	109.4	281.2	293.1	5065.30
	9	42.33	173.8	80.4	132.6	110.6	392.7	380.4	5646.81
	10	42.24	173.2	144.1	157.6	139.2	761.0	1149.3	10014.60

Table U7: average consumption by commodity groups for each decile

This table is only for those households which have reported positive consumption for Kerosene from sources other than PDS

		value.kerosene .other	value_entertai nment	value_personal_ effects	value_toiletar ticles	value_sundrya rticles	value_consumer_s ervices	value_conve yance	Total househol d consump tion
		Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean
ntiles of mpce30 day by sector	1	53.1	49.2	24.1	65.8	50.4	60.0	69.0	1985.1
	2	61.5	70.1	29.8	76.5	61.7	66.8	76.8	2382.4
	3	88.5	84.7	27.8	89.1	71.1	82.0	111.0	2774.5
	4	97.6	99.2	42.7	95.0	76.8	111.9	140.7	3019.6
	5	96.5	100.0	43.7	100.9	80.9	119.5	157.0	3275.2
	6	108.1	111.2	46.6	101.3	86.0	146.7	193.2	3395.4
	7	110.5	128.8	60.7	107.4	92.0	178.4	235.6	3783.0
	8	101.5	131.7	56.8	106.5	90.7	212.1	266.5	4065.3
	9	93.1	142.4	91.6	109.6	96.3	267.7	313.5	4427.6
	10	91.8	164.3	85.7	139.3	118.3	479.1	530.5	6882.0

Table U8: Percentage Distribution of households by category of kerosene consumption

		Percent
Neither PDS nor Other Sources	1	49.2
Only from other sources	2	18.0
Only from PDS	3	26.7
Both PDS and Other sources	4	6.1
	Total	100.0

Table A1: Comparison of reduction in allocation of PDS Kerosene and decline in the percentage of Rural Households using Kerosene for Lighting and Urban Households for Cooking purpose during 1999-00 to 2005-06

Sl. No.	Name of the State	Per Capita Net State Domestic Product 2005-06 Rs.	Per Capita PDS SKO Allocation 2007-08 @ Ltr	Quantity of PDS SKO Allocated by MOP&NG ('000 MT)		NSSO SURVEY		EXTENT OF REDUCTION		
						% of Rural households using SKO for Lighting + % of Urban households using SKO for cooking @@	% of house holds which exited from PDS SKO	Actual reduction of PDS SKO from 1999-00 to 2005-06 %	Scope for further reduction upto 2005-06 %	
										6
	1	2	3	4	5	6	7	8	9	10 =(8-9)
	HIGH INCOME			1999-00	2005-06	1999-00	2005-06			
1	Chandigarh	86629	15.8	15.4	13.1	19.3	11.2	42.0	15.2	26.8
2	Goa *	70112	15.2	28.1	19.2	14.1	6.3	55.2	31.6	23.6
3	Delhi *	61676	12.7	204.7	168.5	19.0	7.3	61.5	17.7	43.8
4	Puducherry	48477	14.7	15.4	12.3	26.7	10.4	60.9	20.2	40.7
5	Haryana	38832	7.9	171.7	145.6	15.8	6.7	57.8	15.2	42.6
6	Maharashtra	37081	15.3	1578.0	1276.9	26.7	19.1	28.2	19.1	9.1
7	Punjab	34929	11.5	343.1	237.2	13.8	4.0	71.1	30.9	40.2
8	A&N Islands	34853	21.3	6.7	5.8	37.2	9.3	74.9	13.7	61.2
9	Gujarat	34157	16.9	832.4	743.8	22.6	16.3	27.9	10.7	17.3
10	Himachal Pradesh	33805	9.9	61.1	50.5	4.7	2.8	41.6	17.2	24.4
AVERAGE		48055.1	14.1	325.7	267.3	20.0	9.3	53.2	19.1	33.0
	MIDDLE INCOME									
1	Kerala	30668	8.1	302.1	216.3	25.2	10.3	58.9	28.4	30.5
2	Tamil Nadu	29958	11.0	720.1	558.9	28.6	13.4	53.1	22.4	30.7
3	Karnataka	27291	10.3	531.2	461.5	25.0	17.1	31.5	13.1	18.4
4	Andhra Pradesh	26211	8.1	679.8	517.2	28.2	13.7	51.5	23.9	27.6
AVERAGE		28532.0	9.4	558.3	438.5	26.7	13.6	49.0	22.0	26.8
	LOW INCOME									
1	West Bengal	25223	11.0	812.3	752.1	61.7	45.3	26.6	7.4	19.2
2	Mizoram	25123	8.1	8.1	6.2	11.3	7.9	30.4	23.7	6.8
3	Tripura	24706	11.3	32.6	30.8	47.8	27.5	42.4	5.3	37.1
4	Uttarakhand ^b	24585	12.2	95.0	89.8	59.4	52.3	11.9	5.4	6.5
5	Arunachal Pradesh	23788	10.0	10.3	9.3	29.7	23.5	20.9	10.1	10.8
6	Meghalaya	23420	10.5	21.0	20.4	45.4	17.8	60.7	2.7	58.1
7	Manipur	20326	9.7	22.8	19.9	22.5	8.6	61.6	12.6	49.0
8	Jharkhand ^c	19066	9.0	214.0	211.2	74.9	57.8	22.8	1.3	21.5
9	Assam	18598	11.3	272.6	258.0	66.3	57.8	12.9	5.4	7.5
10	Orissa	17299	10.1	318.9	315.0	72.3	55.5	23.2	1.2	22.0
11	Madhya Pradesh ^a	15647	9.1	513.0	488.6	31.8	25.0	21.4	4.8	16.7
12	Uttar Pradesh ^b	13262	8.4	1306.0	1241.8	62.3	55.6	10.8	4.9	5.9
13	Bihar ^c	7875	9.1	656.0	647.4	84.9	75.8	10.7	1.3	9.4
AVERAGE		19916.8	10.0	329.4	314.7	51.6	39.3	23.9	6.6	17.2
	Total**	25716	10.3	9772	8517	36.2	24.4	32.6	12.8	19.8

*For Delhi and Goa figures of NSSO Survey have been prorated at All India Level ** Excluding Daman/Diu and LakshadweepSikkim , Nagaland, Rajasthan , Chhattisgarh & J & K deleted on a/c of non availability / negative figs

@ Based on Projected All India population as of 01.04.08 .(Figures are exclusive of Daman Diu , Dadar & Nagar Haveli and Lakshadweep)

@@ Assuming that PDS SKO is used predominanetly for lighting and biomass for cooking in Rural areas. In urban areas it is mainly used for Cooking since urban areas are electrified

a,b,c : For Chatisgarh,Jharkhand & Uttarakhand SKO Allocation for 1999-00 has been pro rated at 2005-06 levels for Madhya Pradesh,Bihar & Uttar Pradesh respectively as these states were part of the latter states in 1999-00