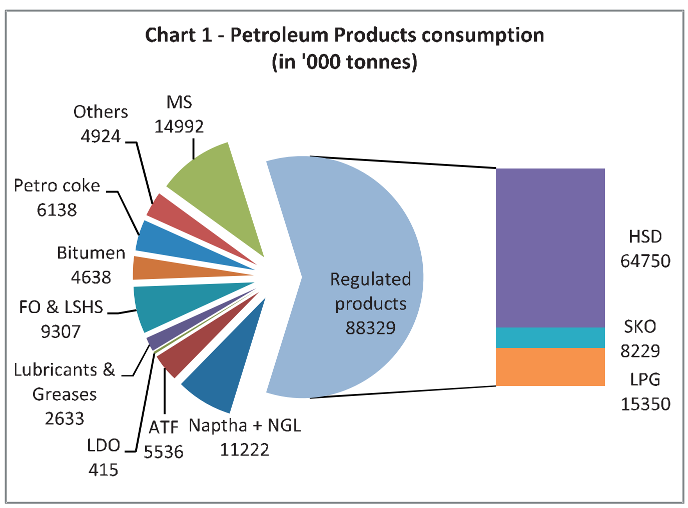
Chapter 1 Introduction

1.1 Petroleum Scenario in India

The hydrocarbon sector plays vital role in the economic growth of the country. Among all primary energy sources in the country, consumption of oil and natural gas is the second highest, after coal. Consumption of energy in India has shown an increasing trend from 1,203 Kilo Watt hour (KWh) in 1970-71 to 4,816 KWh in 2010-11(Compounded Annual Growth Rate-CAGR : 3.44 *per cent*) with a higher growth in consumption of oil and natural gas (CAGR 1970-71 to 2010-11: Oil 6.07 *per cent* and Natural Gas 11.25 *per cent*). The prices of most commonly consumed petroleum products *viz*. High Speed Diesel[1] (HSD, commonly called Diesel), Liquefied Petroleum Gas (LPG, Domestic), and Superior Kerosene Oil (PDS - SKO, commonly called Kerosene Oil) are regulated and these three products come under the category of regulated products. The prices of other major petroleum products, Motor Spirit[2] (MS, commonly called Petrol), Aviation Turbine Fuel (ATF), LPG – Commercial, SKO (other than PDS), Furnace Oil (FO), Naphtha, Low Sulphur Heavy Stock (LSHS), *etc*. are not regulated and are commonly referred to as non-regulated products.

1.1.1 Consumption and Supply of Petroleum Products

Consumption



Consumption of petroleum products was 1,28,946 Thousand Metric Tonnes (TMTs) during 2007-08. It progressively increased to 1,48,132 TMTs during 2011-12. Details of year wise consumption of regulated and non regulated petroleum products are given in **Annexure - I.** Consumption of petroleum products in the country during 2011-12 is shown in Chart 1. Regulated products *viz*. HSD (partially de-regulated in January 2013), LPG for domestic use or Domestic LPG and SKO supplied through the public

[1] ***Diesel: The price of HSD was deregulated for bulk consumers from January 2013.***
[2] ***Petrol: The price of petrol was deregulated from 25 June 2010.***

distribution system (PDS SKO) constituted 60 *per cent* of total consumption of petroleum products. During 2011-12, consumption of MS (which has been de-regulated since 25 June 2010) was 10 *per cent*. Other non-regulated products constituted the balance 30 *per cent* of total consumption.

Primary users of various petroleum products in the country are listed below:

Table 1
Primary users of various petroleum products in India

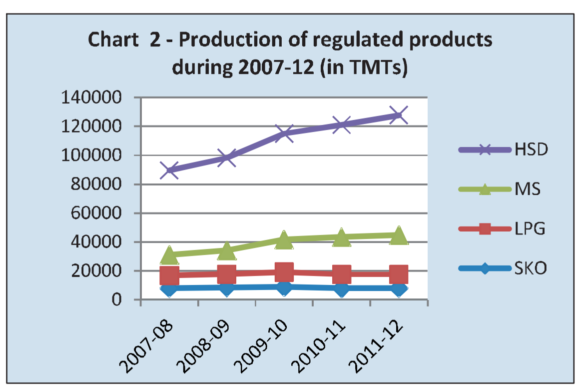
Major Products	Users
HSD	Public transport, Car users, Farmers, Genset users, Industries
LPG	Domestic consumers, Commercial consumers
SKO	Domestic consumers, Genset users, Industries
Naphtha	Industries (Fertilizers & others)
MS	Car users
ATF	Airlines
LDO(Light Diesel Oil)	Industries (as fuel)
Lubes	Car users, Public Transport, Farmers
FO	Industries, Commercial users (as fuel)
LSHS	Industries (as fuel)
Bitumen	Public works, Industries

Source: Standing committee on Petroleum and Chemicals (2001)

HSD is used in several sectors as an input and has a weightage of 4.67 *per cent* in the Wholesale Price Index (WPI), the highest amongst 670 commodities. For each Rupee increase in HSD price, the WPI is estimated to increase by 0.11 *per cent*. The impact on WPI of increase of one Rupee on SKO and MS prices would be 0.05 *per cent* and 0.02 *per cent* respectively while increase of ₹10/cylinder of domestic LPG would impact WPI by 0.02 *per cent*.[3] The prices of regulated products, thus, have a direct impact on the economy.

Supply

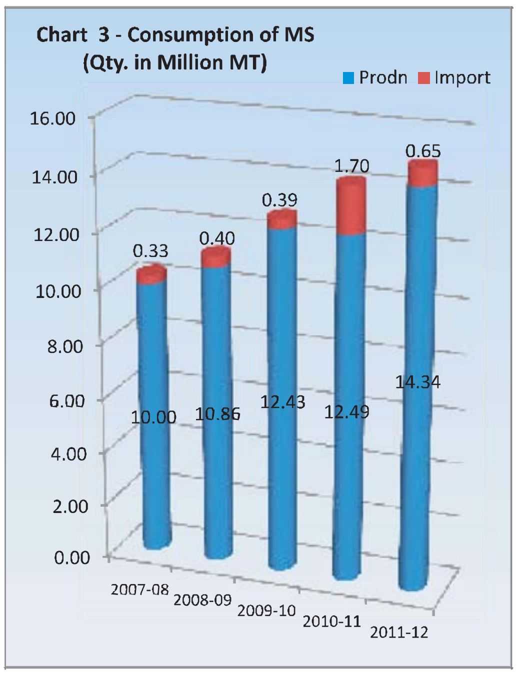
The demand is met through indigenous production and supplemented by imports. Details of production and import/export of petroleum products during 2007-12 are given in **Annexure-II and III.**

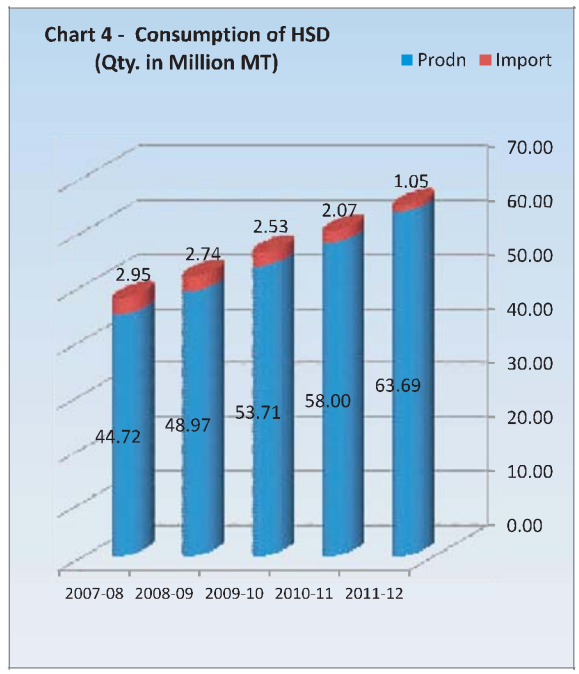


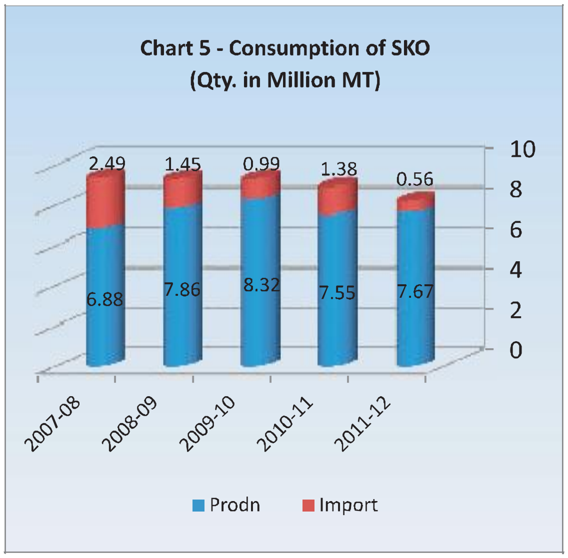
[3]***Source: Notes for Supplementaries of PPAC, MoPNG January 2013***

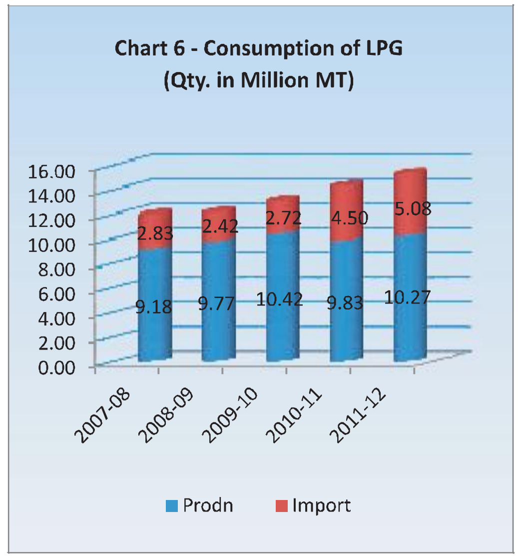
Production of petroleum products other than SKO, Light Diesel Oil (LDO) and LSHS showed an increasing trend during 2007-12. However, production of LPG and SKO remained lower than domestic demand during the above period and, therefore, had to be imported. Though domestic production of MS and HSD was higher than demand, OMCs had to import 2.14 *per cent* of the requirement of these products to meet quality standards. Production of regulated products *viz*. HSD, MS, SKO and LPG during 2007-08 to 2011-12 is shown in Chart 2.

Import of petroleum products in the country showed a decreasing trend from 22,462 TMT in 2007-08 to 14,997 TMT in 2011-12. Position of supply of regulated products *viz*. HSD, MS, LPG and SKO met through own production and import during 2007-08 to 2011-12 is given in Charts 3 to 6 below:







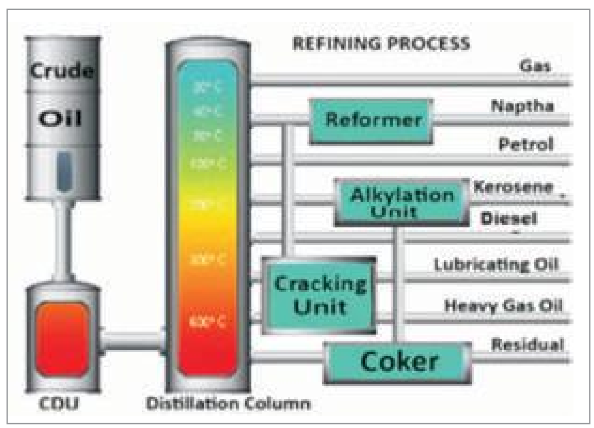


Government does not allow export of crude. However, the refining capacity of crude of Indian refineries is more than the domestic demand. India is a major exporter of petroleum products. Of the total exports of petroleum products made by South East Asia Region counties, exports of these products by India alone ranged between 13 (2008) and 21 *per cent* (2012).

1.2 Refining of petroleum products in India

1.2.1 Refining Process

Crude is refined by a process of fractional distillation to produce an array of refined petroleum products. The refining process involves four basic steps *viz.* Distillation, Cracking, Treating and Reforming.



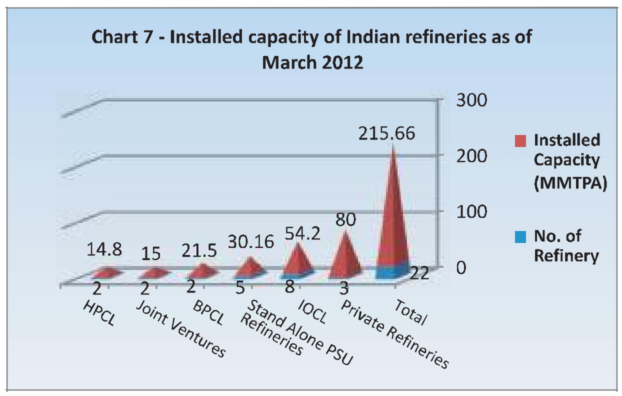
***Distillation**: Distillation is the first step in refining of crude oil in distillation towers (CDU – Crude Distillation Unit) at atmospheric pressure for removal of more volatile components. During the process, the light materials (also known as light distillates) like propane and butane, vaporize and rise to the top of the column. Medium weight material i.e. middle distillates, including gasoline, jet and HSD fuels, condense in the middle. Heavy materials (heavy ends) called reduced crude oil condense in the lower portion of the atmospheric column.*

***Cracking:** A process that breaks or cracks the heavier (higher boiling – point) petroleum fractions into more valuable products such as gasoline, fuel oil, and gas oils and decrease the amount of residuals.*

***Reforming:** This uses heat, pressure and a catalyst (usually containing platinum) to bring about chemical reactions to upgrade Naphtha into high octane petrol and petrochemical feedstock.*

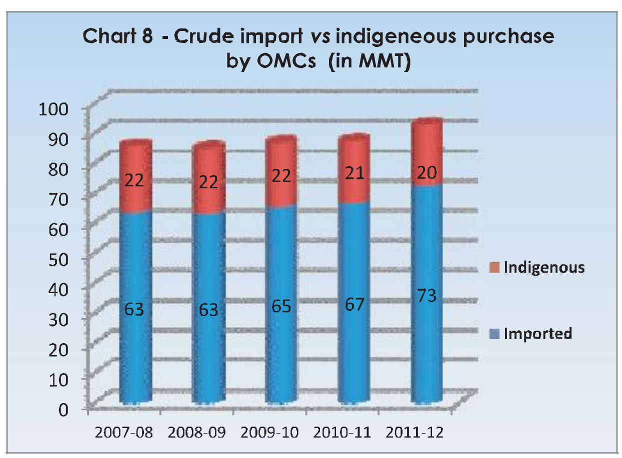
***Hydro treating**: It is a way of removing contaminants/impurities from intermediate or final products.*

1.2.2 Refining capacity in the country



There are 22 refineries with a combined refining capacity of 215.66 million tonnes per annum (MMTPA) in the country as of 31 March 2012. Details of the installed capacities of refineries are given in Chart 7.

Of these, 19 refineries with a combined capacity of 135 MMTPA are in public sector (including Joint Ventures-JVs) while 3 with a combined capacity of 80 MMTPA are in private sector (Reliance Industries Limited -2 and Essar Oil – 1).



1.2.3 Sourcing of crude

The country is not self-sufficient in production of crude and depends largely on import. Import of crude increased from 1,21,672 TMTs in 2007-08 to 1,71,729 TMTs during 2011-12, while indigenous production of crude increased only marginally from 34,130 TMTs in 2007-08 to 38,080 TMTs in 2011-12. In 2011-12, the ratio of imported to indigenous crude was 4.50:1. As could be seen from Chart 8, the sourcing of imported crude by Oil Marketing Companies (OMCs) has been increasing over the years.

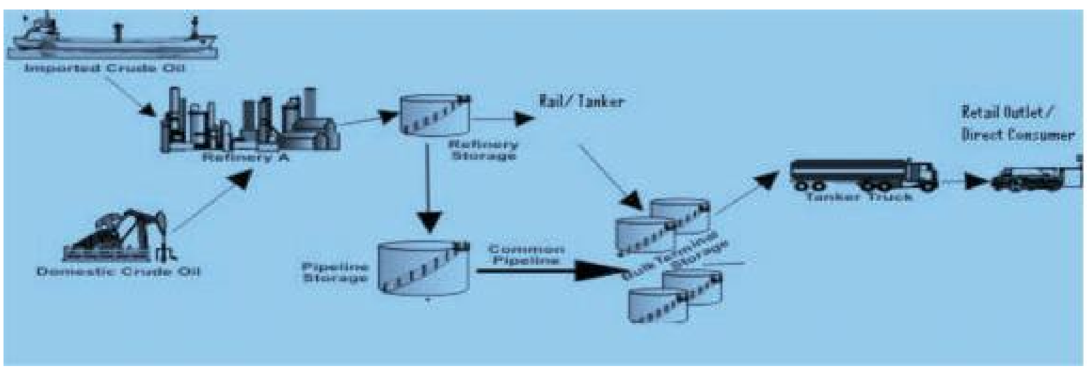
1.3 Marketing of Petroleum Products

1.3.1 Marketing activities

The marketing activities involve movement of products from refinery or port through pipelines/rail/vessels/road to the storage terminals/depots and distribution to the retail outlets/direct consumers. While LPG requires separate storage units and bottling plants where the product is bottled into cylinders, OMCs deliver MS and HSD to the retail outlets through owned/hired tank trucks. As regards PDS Kerosene, OMCs make the product available at the storage terminals/depots from where the State Governments (Civil Supplies Department) arrange to deliver it to PDS Kerosene delivery points.

Marketing activities of OMCs are depicted in Chart 9.

Chart 9 - Marketing of the petroleum products by OMCs



1.3.2 Oil Marketing Companies (OMCs)

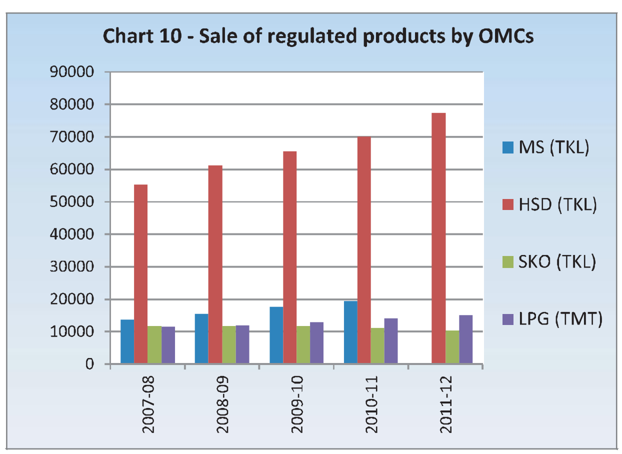


Chart 10 - Sale of regulated products by OMCs

There are three major OMCs in the public sector, *viz*. Indian Oil Corporation Limited (IOCL), Bharat Petroleum Corporation Limited (BPCL) and Hindustan Petroleum Corporation Limited (HPCL) for marketing regulated petroleum products. Refineries in public sector supply regulated products first to OMCs and then export the remaining quantity. OMCs also purchase regulated products from private refineries and import the balance to meet the demand. Private companies *viz*. Reliance Industries Limited (RIL), Essar Oil Limited and Shell India also have retail outlets for distribution of MS and HSD. However, the latter account for only 2966 outlets (7 *per cent*) against 42138 retail outlets operated by OMCs as of 1 April 2012. Details of year-wise sale of regulated products *viz*. HSD, MS, domestic LPG and PDS Kerosene by OMCs during the period 2007-08 to 2011-12 are given in Chart 10.

1.3.3 Essential elements in the price build-up of regulated products

The upstream oil PSUs *viz.* Oil and Natural Gas Corporation Limited (ONGC) and Oil India Limited (OIL) produce crude through their operations which is sold to PSU refineries for processing into petroleum products. Major requirement of crude is however, met through imports by PSU refineries. The raw material 'crude' is processed into various petroleum products in the refineries. It is seen that the cost of crude constitutes more than 90 *per cent* of the product cost. Due to inherent nature and complexity of production process, the refineries argue that one particular product cannot necessarily be identified with one particular process. To arrive at the cost of production of each product, joint cost is apportioned to all the products based on their sales realization (quantity produced X unit selling price) at the refineries.

The system of pricing the petroleum products being followed has some essential components or features, which are as under:

- **Import Parity Price (IPP)**: It represents the price that importers would pay in case of actual import of HSD, MS, LPG and SKO at the respective Indian ports and includes the elements of FOB (free on Board) price, ocean freight, insurance, customs duty, port dues *etc.*

- **Export Parity Price (EPP):** Represents the price which oil companies would realize on export of petroleum products i.e. FOB price + Advance Licence Benefit.

- **Trade Parity Price (TPP):** TPP consists of 80 *per cent* of IPP and 20 *per cent* of EPP.

- **Refinery Gate Price**: Refineries of OMCs, standalone PSUs (those refineries which do not have marketing outlets such as CPCL, MRPL *etc.*) and private refineries are paid TPP/IPP for the purchase of MS and HSD/Domestic LPG and PDS kerosene respectively by OMCs and are commonly known as Refinery Gate Price (RGP) or Refinery Transfer Price (RTP).

- **Marketing charges:** Marketing charges include marketing cost, marketing margin, inland freight, delivery charges *etc*.

- **Desired selling price (DSP):** This includes the weighted average of RGP, freight, Terminalling charges, marketing cost, marketing margin, return on working capital and retail pump outlet charges including return on investment.

- **Depot Price:** Depot Price, also known as ex-storage point price, is fixed by the GoI for regulated products, which is less than the DSP.

- **Under Recovery:** The difference between the Depot price as fixed by GoI for regulated products and the DSP as per the price build up (excluding taxes and dealers' commission).

- **Taxes:** Taxes include the excise duty levied on the products by Central Government, State levies *viz*. Value Added Tax/Sales Tax, entry tax and surcharge and octroi by local bodies. Presently, all these taxes and octroi of local bodies are forming part of the retail selling price of the products.

- **Dealer commission**: This is the rate determined by GoI on the products and paid by the customers.

- **Retail Selling Price (RSP):** The price at which OMCs sell the regulated products as decided by GoI including excise duty, VAT and dealers commission.

1.4 Evolution of pricing mechanism of Petroleum Products

The pricing of petroleum products *viz*. HSD, PDS kerosene and Domestic LPG are presently controlled by GoI. The price of HSD at refinery gate is being regulated at Trade Parity Price (TPP) while PDS Kerosene and Domestic LPG are priced at Import Parity Price (IPP) level. RSP to be paid by consumers for these three products is also fixed by GoI. The price of MS is market determined both at refinery and retail level since 25 June 2010 onwards.

GoI started regulating the oil prices from 1948. The main reason for regulating the prices is to insulate the domestic economy from the volatility of petroleum prices in the world market. Chronology of decisions of GoI in regulating prices of petroleum products is given below:

1.4.1 Pricing decisions (1948 – 1997)

During this period all petroleum products were kept under regulation.

1948 - Regulated the oil prices through Valued Stock Account Procedure agreed with Burmah Shell

1961 - 1969 - Adopted Import Parity Price (IPP) based on recommendations of Damle Committee (1961), Talukdar Committee (1965) and Shantilal Shah Committee (1969)

1974- Changed to 'Cost Plus basis' commonly known as Administed Pricing Mechanism (APM) based on Oil Prices Committee (OPC) recommendations

1984- Compensation to OMCs changed from flat rate on capital employed to 12 *per cent* post tax return on net worth and weighted average cost of borrowings based on recommendation of Oil Cost Review Committee(1984)

1997- Decided to dismantle the APM in a phased manner based on the recommendations of Strategic Planning Group on Restructuring of Oil Industry (R-Group) and Expert Technical Group set up in January 1995 and June 1996 respectively.

1.4.2 Pricing Decisions (1997 – till date)

1997-2006: Based on the Strategic Planning Group on restructuring of Oil Industries (R group) recommendations, GoI dismantled APM of petroleum products in a phased manner from 1997 to 2002 as APM model of pricing, according to the R group report, could not generate sufficient financial resources required for investments in technological up-gradation and did not provide strong incentives for cost minimization as the cost plus formula bred inefficiencies. As a first step, GoI de-regulated products *viz*., Fuel Oil, LSHS and Naphtha in April 1998 and Aviation Turbine Fuel in April 2001, i.e., OMCs were given free hand to fix the prices of these products based on market conditions. Effective from April 2002, the prices of MS and HSD were also made market determined. However, de-regulation of HSD and MS prices was only for a short period of two years. In view of steep rise in oil prices in international market since 2004 onwards, GoI reintroduced control of retail sale prices of these two products. Effective April 2002, RGP of all petroleum products was calculated based on Import Parity Price (IPP[4]). This continued up to June 2006.

[4]IPP: It represents the price that importers would pay in case of actual import of HSD, MS, LPG and SKO at the respective Indian ports and includes the elements of FOB (free on Board) price, ocean freight, insurance, customs duty, port dues etc.

2006-2010: Subsequently, a Committee chaired by Dr. Rangarajan (February 2006) recommended introduction of Trade Parity Price (TPP[5]) in place of IPP as RGP for MS and HSD. The rationale for the change was that 20 *per cent* of MS and HSD production of the country was being exported. The recommendation was accepted by GoI and implemented from June 2006. Pricing of Domestic LPG and PDS Kerosene continued under IPP methodology.

Dr. Rangarajan Committee's recommendations accepted

- Adoption of Trade Parity Price (80 *per cent* Import Parity Price and 20 *per cent* Export Parity Price) for MS and HSD as Refinery Gate Prices with effect from June 2006.
- PDS kerosene only to BPL families but not implemented.

Based on the recommendation, GoI reduced the custom duty on MS and HSD periodically from June 2006 and charged excise on MS and HSD at specific rates (in place of earlier ad valorem rates) from March 2008. GoI also accepted the recommendation to restrict subsidized PDS Kerosene only to below poverty line (BPL) families, which was not implemented.

2010-2012: The Expert Group under the chairmanship of Dr. Kirit S Parikh recommended (August 2009) introduction of market determined price both at refinery gate and at retail level for MS and HSD. GoI decided (June 2010) that the price of MS and HSD would be market determined both at refinery gate and retail level. HSD, however, continued to be under regulation till 17 January 2013.

Kirit Parikh Committee's recommendations accepted

- MS price is market determined with effect from June 2010
- In principle approval for market determined price for HSD

January 2013: GoI freed (January 2013) the price of HSD for supply to bulk consumers and OMCs increased the prices for bulk supplies made directly from its installations by ₹9.25 per litre. The sale of HSD to bulk consumers has reduced to 10 *per cent* of total HSD sales in August 2013 as against the average sale of 18 *per cent* during 2011-12. GoI also directed OMCs to increase the price of HSD to retail consumers by ₹0.45 per litre from January 2013; fixed the entitlement of subsidized Domestic LPG cylinders at 9 (nine) per consumer from 2013-14, further increased to 12 cylinders per consumer in February 2014.

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[5]*TPP: TPP consists of 80 per cent of IPP and 20 per cent of Export Parity Price (EPP)*

Government's Vision for Downstream Sector and Tariff and Pricing Policy

The long term policy of the GoI in respect of refining and marketing is reflected in the Hydrocarbon Vision-2025 which envisages achievement of free pricing of products while continuing subsidized prices for some products in certain remote areas, which are to be identified and reviewed from time to time.

The Hydrocarbon Vision articulated a rational tariff and pricing policy that is vital to ensure healthy growth of the hydrocarbon sector and to protect the consumers as well. It identified the following action to be taken in the medium term:

i) Phase out existing subsidies as early as possible.

ii) Set up a Group of Experts to determine appropriate levels of tariffs and duties for introduction in a phased manner as early as possible.

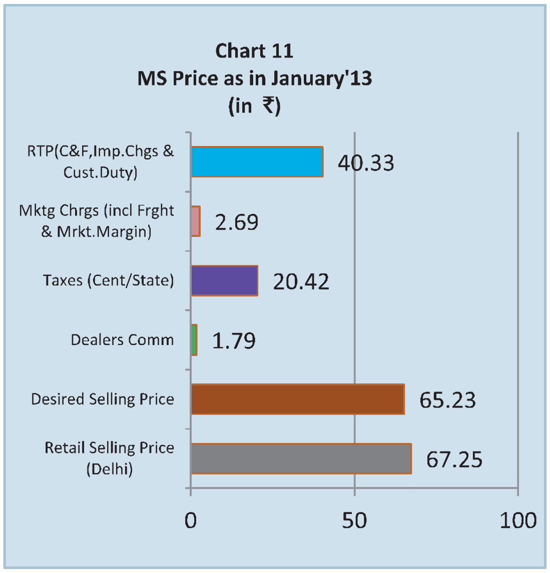
iii) Transfer freight subsidy on supplies to far flung areas and subsidies on products to fiscal budget. Necessity for concession is to maintain the supply line to hilly and remote areas, after decontrol of marketing.

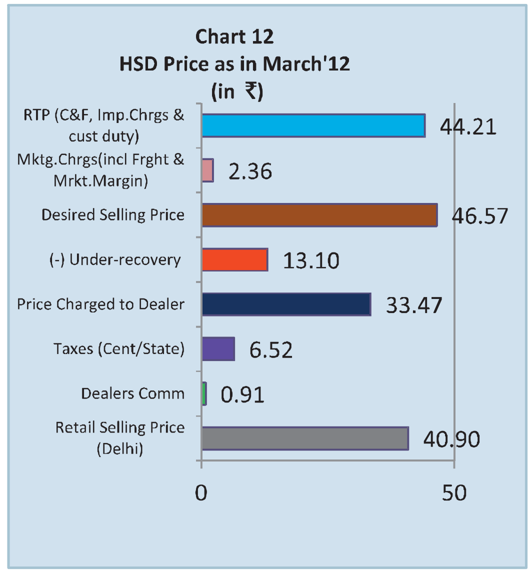
Hydrocarbon vision – 2025

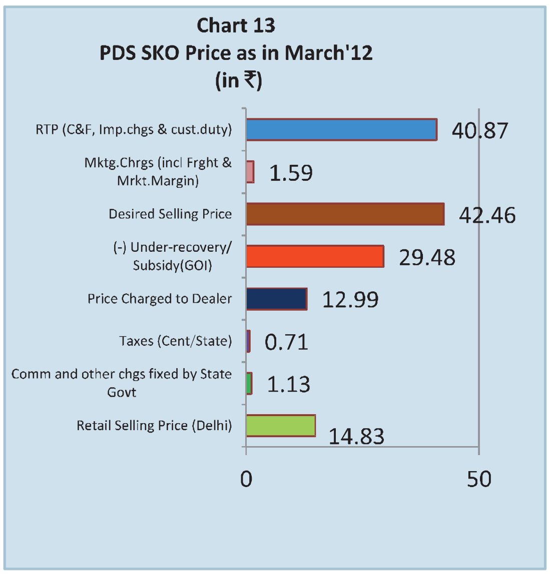
- Phasing out existing subsidies as early as possible
- Determine appropriate level of tariff and duties
- Transfer of subsidies to fiscal budget

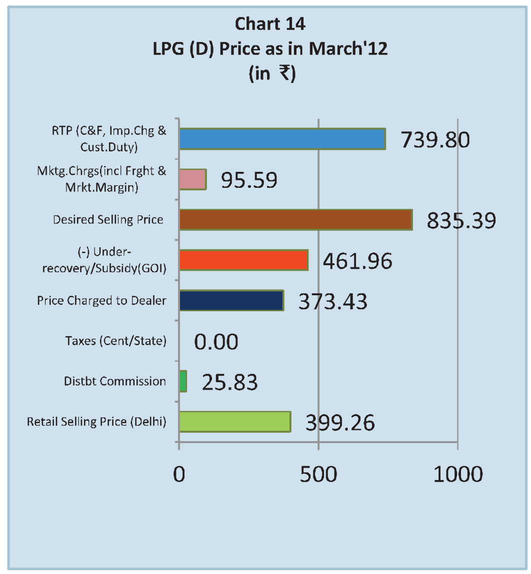
1.5 Price build-up of regulated products

The structure of price build up for MS, HSD, Domestic LPG and PDS Kerosene at New Delhi in March 2012/January 2013 is given in charts 11 to 14 below:









1.6 Compensation of under recoveries to OMCs

With the dismantling of Administered Price Mechanism (APM) in 2002, prices of MS and HSD were de-regulated. However, the prices of PDS Kerosene and domestic LPG could not be linked/aligned with international prices of products, which resulted in under recovery to OMCs. In order to distribute PDS Kerosene and Domestic LPG at subsidized rate (not reflecting actual international prices) to the end consumers, GoI decided (October 2003) that OMCs would absorb about a third of losses incurred on these two products from the surpluses generated on MS and HSD while the balance losses would be shared equally by the upstream companies *viz*. ONGC, OIL and GAIL on the one hand and GoI on the other. However, the prices of MS and HSD were again brought under regulation (control) in 2004 due to unprecedented increase in the prices of crude and products in the international market and the under recoveries of these products were also compensated in the manner decided in October 2003.

Based on the recommendations of Kirit Parikh committee (February 2010), which included inter alia, "*Petrol being product of final consumption, increase in prices of petrol could be borne by motorized vehicle owners*", GoI de-regulated MS totally in June 2010. The burden sharing mechanism by GoI, thus, continues on three products namely - HSD, PDS kerosene and Domestic LPG.

Ministry of Finance (MoF) approves the method and amount of compensation on account of under-recoveries two to three times a year in consultation with MoPNG. The quantum of compensation is decided after analyzing (by MoF) the price of crude oil in international market, demand and consumption of sensitive petroleum products (MS - till June 2010, HSD, PDS Kerosene and Domestic LPG) in the country, financial condition of upstream companies to absorb a part of losses in the form of crude oil discount and OMCs, so that the latter are able to declare their quarterly results.