

**AN ANALYSIS OF INDIA'S
OIL POLICY ALTERNATIVES**

By

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of
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C E R T I F I C A T E

This is to certify that the thesis entitled, "AN ANALYSIS OF INDIA'S OIL POLICY ALTERNATIVES" which is being submitted by Mr. Kapil Thukral to the Applied Mechanics Department, Indian Institute of Technology, Delhi, for the award of the degree of Doctor of Philosophy, is a record of bonafide research work carried out by him. He has worked under my guidance and supervision and has fulfilled the requirements for the submission of this thesis, which has attained the standard required for a Ph.D. degree of this Institute. The results presented in this thesis have not been submitted elsewhere for the award of any degree or diploma.

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(Kapil Thukral)

Abstract

India's net oil import bill has reduced considerably from its peak in 1980/81. This is due largely to: (i) a rapid increase in indigenous crude production, particularly from 1980/81 to 1984/85; and (ii) generally soft oil prices in the international market, particularly after 1983/84. However, indigenous crude production is not anticipated to rise rapidly in the foreseeable future and the international oil market will continue to be characterized by uncertainties.

It is against this background that it becomes necessary to analyze the implications of international oil market developments on the Indian petroleum industry in particular, and on the Indian economy in general. This includes an analysis of the impact of: (i) crude and product price movements; (ii) price differences between various crudes and various products; and (iii) the anticipated reduction in the availability of relatively high quality crudes in the international market. These issues are discussed at length in Chapters V and VI, where it is shown that it is not necessary that self-sufficiency in indigenous refining capability would always be the least cost option. In fact, if crude and product price levels were to remain

within a certain reasonable range, it is shown that to ensure its product supplies, India may even wish to negotiate a product procurement contract with an oil surplus nation in Asia or the middle-East. The analytical framework adopted also gives some idea of the terms of such a contract.

As it is clear that the implications of global oil market developments will relate to the level of demand for imported oil within India, the analysis in Chapters V and VI is with reference to three scenarios for petroleum demand projections and two levels of indigenous crude oil production. The implications of increased indigenous natural gas supplies are also studied, but only to the extent that increased LPG production becomes possible.

The three petroleum demand scenarios are based on projections for total energy demand which are presented in Chapter IV. In Scenario I, major sub-sectoral growth rates are projected to remain unchanged from the trends observed in the past, and the ratio of energy consumption to activity level represents an average level observed during the past decade or more. The five major sectors (industry, agriculture, transport, commercial services/Government and residential) are disaggregated to the extent possible -- depending on data availability as discussed in Chapter III -- and certain determinants

of energy demand are also identified before making demand projections. In Scenario II, the total energy demand mix changes as the economy adopts a lower energy intensity growth path. And in Scenario III, the total energy demand mix changes further when certain conservation and inter-fuel substitution measures including some promising renewable energy technologies, begin to be adopted.

The rationale behind analyzing the petroleum supply options for three demand scenarios is only to illustrate the importance of energy demand management as an energy policy tool. The interested reader may however, wish to study Chapters V and VI before Chapters III and IV.

Table of Contents

I.	<u>Introduction</u>	...	1
1.1	The Dilemma for Oil Importing Developing Countries.	...	1
1.2	Energy Use in India : The Role of Oil	...	3
1.3	Objective	...	6
1.4	Scope and Limitations	...	7
1.5	Overview	...	12
II.	<u>Literature Review</u>	...	15
2.1	Introduction	...	15
2.2	Energy-Economy Linkages	...	15
2.2.1	Energy Supply/Demand Analysis for Developed Countries.	...	16
2.2.1.1	The Role of Inter-Factor Substitution	...	16
2.2.1.2	Energy Policy Modeling	...	17
2.2.2	Energy Supply/Demand Analysis for Developing Countries.	...	20
2.2.2.1	Demand Analysis	...	21
2.2.2.2	Price and Income Elasticities	...	23
2.2.2.3	Supply Analysis	...	25
2.3	International Oil Market Developments	...	27
2.3.1	Changing Perceptions of the International Oil Market	...	27
2.3.2	On the Return to Higher Oil Prices	...	28
2.3.3	Why is the International Oil Market Uncertain	...	30
2.3.4	Outlook for Crude and Product Price Differentials	...	34
2.3.5	The Outlook for Crude and Product Markets in Asia	...	38
2.4	Summary	...	42

III.	<u>Energy Demand : Review of Data Base</u>	...	44
3.1	Introduction	...	44
3.2	Industrial Sector	...	45
	3.2.1 Electricity Consumption Intensity	..	47
	3.2.2 Fuel Oils and Non-Coking Coals	...	48
	3.2.3 Other Data	...	49
3.3	Agriculture Sector	...	51
	3.3.1 Land Use Pattern For Cultivation	...	52
	3.3.2 Lift Irrigation	...	54
	3.3.3 Land Preparation	...	56
3.4	Transport Sector	...	59
	3.4.1 Rail Traffic	...	61
	3.4.2 Road Transport	...	63
	3.4.3 Water Transport	...	67
	3.4.4 Air Transport	...	68
3.5	Commercial/Services/Government Sector	...	70
3.6	Residential Sector	...	73
	3.6.1 Income Distribution and Rural-Urban Mix	...	75
	3.6.2 Quality of Survey Data	...	78
	3.6.3 Energy for Cooking and Lighting	...	82

IV.	<u>Energy Demand Analysis : Methodology and Results.</u>	...	85
4.1	Introduction	...	85
4.2	Industrial Sector	...	89
	4.2.1 Methodology	...	89
	4.2.2 Scenario I Demand Projections	...	90
	4.2.3 Scenario II Demand Projections	...	92
	4.2.4 Scenario III Demand Projections	...	95
4.3	Agriculture Sector	...	96
	4.3.1 Methodology	...	96
	4.3.2 Scenario I Demand Projections	...	100
	4.3.3 Scenario II Demand Projections	...	101
	4.3.4 Scenario III Demand Projections	...	105
4.4	Transport Sector	...	109
	4.4.1 Methodology	...	109
	4.4.2 Traffic Projections for Rail and Road Transport	...	119
	4.4.3 Scenario I Demand Projections	...	120
	4.4.4 Scenario II Demand Projections	...	123
	4.4.5 Scenario III Demand Projections	...	125
4.5	Commercial/Services/Government Sector	...	128
	4.5.1 Methodology	...	128
	4.5.2 Scenario I and Scenario II Demand Projections	...	129
	4.5.3 Scenario III Demand Projections	...	130
4.6	Residential Sector	...	132
	4.6.1 Methodology	...	132
	4.6.2 Energy Consumption Norms	...	138
	4.6.3 Population Growth	...	140
	4.6.4 Scenario I Demand Projections	...	143
	4.6.5 Scenario II Demand Projections	...	147
	4.6.6 Scenario III Demand Projections	...	148

4.7	Power Generation Expansion	...	150
4.8	Overview of Energy Demand Projections	...	154
V	<u>Petroleum Supply Alternatives : A Model</u>	...	158
5.1	Petroleum Supply/Demand Situation : An Overview	...	158
5.1.1	Introduction	...	158
5.1.2	Demand/Supply of Petroleum Products		160
5.1.3	Indigenous Crude Supply Outlook	...	163
5.2	Refinery Expansion Programmes : Model and Assumptions	...	166
5.2.1	Introduction	...	166
5.2.2	Assumptions Regarding Indigenous Production of LPG and Other Refined Products	...	169
5.2.2.1	Utilization of Existing Refining Capacity	...	169
5.2.2.2	Crude Feed and Product Mix of New Refineries	...	170
5.2.2.3	Capital and Running Costs of New Refineries	...	176
5.2.2.4	Additional Secondary Refining Facilities	...	178
5.2.2.5	LPG Extraction from Natural Gas and LPG Tankage	...	180
5.2.3	Methodology	...	182
5.2.3.1	Basic Framework	...	182
5.2.3.2	LPG Exports	...	192
5.2.3.3	Arab Light Imports	...	193
5.2.3.4	Additions to Secondary Refining Facilities	...	195
5.2.3.5	Increase in Indigenous Crude Production	...	197
5.3	Summary		198

VI.	<u>Petroleum Supply Alternatives : Results</u>	...	201
6.1	Demand For Refined Products	...	201
6.2	Date of Commissioning of New Refineries	...	202
6.3	Implications of Product Price Ratios on the Economics of the Indigenous Refining Industry.	...	205
6.3.1	Base Case Results	...	207
6.3.1.1	Case 1 (Scenario I)	...	207
6.3.1.2	Case 2 (Scenario II), Case 3 (Scenario III) and Case 4 (Scenario III)	...	211
6.3.1.3	Policy Implications	...	215
6.3.2	Sensitivity Analysis	...	219
6.3.2.1	Results	...	219
6.3.2.2	Policy Implications	...	225
6.4	Implications of Crude Quality Changes on the Economics of Indigenous Refining Industry	...	231
6.4.1	Base Case Results	...	232
6.4.1.1	Choice of Crude Oils (Second Run)	...	232
6.4.1.2	Additions to Cracking Facilities (Third Run)	...	235
6.4.2	Sensitivity Analysis	...	242
6.4.2.1	Variations in Parameter Values	...	242
6.4.2.2	Results	...	245
6.4.2.3	Increased Indigenous Crude Production	...	247
6.4.3	Policy Implications	...	248
VII	<u>Conclusions and Extensions</u>	...	253
7.1	Introduction	...	253
7.2	Energy Demand Projections	...	253
7.3	Petroleum Supply Options	...	255
7.4	Overview	...	260

(x)

Annexure I.1	:	Energy Scene in India	...	261
Annexure III.1	:	Industrial Sector (Boilers, Furnaces and Electric Motors)		273
Annexure III.2	:	Energy Use for Lift Irrigation		275
Annexure III.3	:	Rail-Road shift	...	278
Annexure III.4	:	Human/Animal Power for Road Transport	...	279
Annexure III.5	:	Residential Sector : Energy Data Base	...	280
Annexure IV.1	:	Energy Demand Projections in the Industrial Sector -- Methodological Issues	...	282
Annexure IV.2	:	Industrial Sector -- Naphtha Demand Projections	...	283
Annexure IV.3	:	Electricity Conservation in Industry	...	286
Annexure IV.4	:	Fuel Oil and Coal Conserva- tion in Industry	...	289
Annexure IV.5	:	Low Grade Solar Thermal Applications in Industry	...	293
Annexure IV.6	:	Energy Demand Projections for Agriculture -- Methodological Issues	...	297
Annexure IV.7	:	Rationale for Reducing Electricity and Diesel Consumption for Lift Irrigation		301
Annexure IV.8	:	Results of Alternative Regres- sion Runs for Transport Energy Demand Projections	...	316

Annexure IV.9	:	Energy Conservation for Road Transport.	...	317
Annexure IV.10	:	Energy Demand Projections in the Residential Sector -- Methodological Issues	...	323
Annexure IV.11	:	Population Projections	...	326
Annexure IV.12	:	Residential Sector Energy Demand Projections for 2000/01 as per Government of India (1979)	...	328
Annexure IV.13	:	Efficiency Improvements in Kerosene Stoves	...	329
Annexure IV.14	:	Power Generation Expansion	...	334
Annexure IV.15	:	Petroleum Products Demand Projections	...	346
Annexure V.1	:	Additions to Recoverable Hydrocarbon Reserves (1985/86-2005/06)	...	349
Annexure V.2	:	Schematic Diagram of a new Refinery	...	351
Annexure V.3	:	Product Yield Coefficients of Various Crudes	...	352
Annexure V.4	:	Capital and Operating Costs of New Refineries	...	354
Annexure V.5	:	Hydrocarbon Exploration	...	357
Annexure VI.1	:	Crude and Product Price Movements	...	364
Annexure VI.2	:	Base Case Assumptions	...	367

Annexure VI.3	: Refinery Choices (Base Case Results)	...	370
Annexure VI.4	: Crude Price Differences After Cracking Capacity Additions	...	376
Annexure VI.5	: Sensitivity Analysis (Third Run)	...	378
Annexure VI.6	: Sensitivity Analysis for Increased Indigenous Crude Availability.	...	382
Annexure VI.7	: Estimates for Increase in Exploratory Activity if Indigenous Crude Production Rises Marginally.	...	384
References		...	392